Stakeholders' perspectives on assessment and improvement of quality in early childhood education and care: A world-wide kaleidoscope

Edited by
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Stakeholders' perspectives on assessment and improvement of quality in early childhood education and care: A world-wide kaleidoscope

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Editorial: Stakeholders' perspectives on assessment and improvement of quality in early childhood education and care: a world-wide kaleidoscope

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Editorial on the Research Topic
Stakeholders' perspectives on assessment and improvement of quality in early childhood education and care: a world-wide kaleidoscope

Aligned with the 2030 United Nations Sustainable Development Goals (2015) Goal 4, the key aims of early childhood education and care (ECEC) are to offer children from all social backgrounds a good start in their lives, to support parenting as well as families' workforce participation, and, thereby, to sustainably strengthen the national economy over current and future generations. High-quality ECEC has been shown to improve child outcomes and be a buffer against developmental risk factors. For these reasons, governments, ECEC providers, and researchers are increasingly focusing on the frameworks and systems that underpin quality and the measures that assess quality. Meanwhile, policy-related evidence shows that the aims and benefits of high-quality ECEC can only be reached when all stakeholders' needs are acknowledged and sufficiently met.

This Frontiers Topic aimed to promote research as a multidisciplinary endeavor that would derive internationally significant conclusions about the opportunities and obstacles in assessing and delivering quality ECEC at national and local levels. We suggest that diverse, wide-ranging stakeholder input would generate innovative methods for assessing and improving quality that keep pace with today's rapidly changing society. To this end, we broadly define stakeholders to include government and non-government regulatory agencies, ECEC service providers, teachers and educators (or caregivers), families, communities, and children.

Our call for expressions of interest in this Frontiers Research Topic attracted responses from authors, associate editors, and reviewers located across 6 continents and 14 countries. We received 22 manuscripts; of which, 2 were withdrawn, 16 were accepted, and 4 were rejected. Three Frontiers journals were involved in the review/publication process:

- Frontiers in Psychology, with its section Educational Psychology,

- Frontiers in Education, with the sections Educational Psychology and Leadership in Education, and
- Frontiers in Public Health, with its section on Public Health Policy.

We are grateful to many experts who supported the editorial process and/or reviewed each of the articles carefully, including focusing specifically on their structural, conceptual, and linguistic levels. Their generous input has contributed to the high quality and readability of the published articles, which include conceptual analyses, policy and practice reviews, a brief report, and original research. Collectively, these 16 articles illustrate the systemic interlinking of multiple steps toward engaging stakeholders in conceptualizing and assessing quality, quality improvement, and professionalization. The studies feature a variety of research methodologies, many of which illustrate the creativity of scientists in the application of innovative methods, for example, to respectfully gather the views and insights of First Nations communities, as well as of children and young people.

Inspired by Bronfenbrenner and Morris's (2006) bioecological model of human development, we propose a "spiral model" of ECEC research and policy development. In Figure 1, we seek to visually capture the development of processes and sequences from the micro-system steps of "stakeholder needs analysis" through conceptualization and the "definition of framework guidelines" for quality ECEC and the "development of implementation methods" to assess quality. Beyond these are macro-systems and macro-time processes of "evaluation of implementation," leading to the "derivation of further action strategies" and "re-analyses and reforms." The x-axis of the model represents the time dimension (chronosystem) as micro-, meso-, and macro-time. The y-axis represents the different levels at which the systemic processes of quality assessment and improvement in ECCE take place from micro-systems (e.g., childcare groups, centers, and communities) to macro-systems (e.g., national frameworks and cross-cultural comparisons).

Our "spiral model of quality assessment and improvement in ECEC" was inspired by the responses of authors, reviewers, and editors to the Research Topic invitation to explore and discuss models for gathering the perspectives of multiple stakeholders and considering the significance of stakeholder views for conceptualizing, assessing, and improving quality in ECEC. The 16 accepted articles illustrate three different aspects of the spiral model:

(1) engaging stakeholders in ECEC research and policy development through comprehensive and creative approaches to needs analysis;
(2) conceptualizing and assessing quality in ECEC through definitions, implementation methods, and evaluation; and
(3) professionalization and quality improvement in ECEC through action strategies, re-analyses, and proposals for reforms.

Four studies illustrate different national and local approaches to *Engaging Stakeholders in ECEC Research and Policy Development.* Addressing macro-system ECEC reform, Hadley et al. described the principles and theoretical underpinnings of an inclusive, nationwide stakeholder engagement strategy and its application

in a mixed-method sequential design that aimed to contemporize and update Australia's national frameworks for ECEC and school-age care services. Modes of engagement included indirect online surveys for service providers, teachers, educators, other professionals, and families; direct interviews, Delphi discussions, and focus groups; written submissions from individuals and organizations; and educator-facilitated conversations and drawings by children and young people. Skattebol et al. proposed and tested the approachability, acceptability, affordability, accessibility, and appropriateness (5 As) model of engagement to address the critical challenge of access and uptake of ECEC services by families experiencing social and economic adversities, using an iterative Delphi method with 23 high-level, experienced stakeholders.

Cartmel et al. highlighted the role of children and young people as stakeholders in policy reform, describing the design of creative, educator-facilitated methodologies to engage and support them in expressing their ideas. Interested educators were provided with briefings and written information on gathering informed consent, using dialogic drawing, talking circles, and visual elicitation methods, and diarizing their reflections on the images and ideas generated by participating children. Adamson and Skattebol applied a targeted approach to engage stakeholders with specialized, local knowledge of ECEC services in remote areas of Australia with significant populations of First Nations peoples and children under 5 years of age. Their approach aimed to understand and address the low ECEC attendance rates (16%) through input from both Indigenous and non-Indigenous community members.

Seven articles discuss various aspects of *Conceptualizing and Assessment of Quality in ECEC* and present diverse perspectives and approaches to defining, quantifying, and analyzing quality in center and home-based ECEC services. Pianta and Hofkens summarized evidence from a large number of studies conducted in preschools and kindergartens in the United States and 12 other countries using the Classroom Assessment Scoring System (CLASS) indicators of teacher-child emotional support, instructional support, and classroom management. Cohrssen et al. drew on the Australian ECEC context to consider differing stakeholder priorities for quality, as demonstrated by assessment outcomes based on the National Quality Standard (NQS), regulatory indicators, family perceptions, and research-based conceptualizations. Phillips and Boyd applied Bronfenbrenner's ecological theory to explore the intersection of national standards, leadership, governance, relationships, and personal qualities in an in-depth study of ECEC services that had achieved the highest NQS rating of exceeding. Baumeister et al. focused on the quality of home-based childcare services in an evaluation of a participatory procedure for assessing quality by providers and parents, *the Educational and Parenting Test for Home-Based Childcare.* Their findings from a German sample of non-relative caregivers, parents, and experts in ECEC pedagogy show how the acceptance of quality assessment can be achieved among stakeholders through opportunities to participate in the process of quality development. Participatory examination of "what" quality is, and "how" and "when" it is achieved is further explored by Grieshaber and Hunkin in an ethnographic study conducted with Australian educators and pre-service teachers. Responses tap the tangible and intangible aspects of quality, such as what quality "feels like" and how it is created. The final

FIGURE 1
The spiral model of quality assessment and improvement in ECEC.
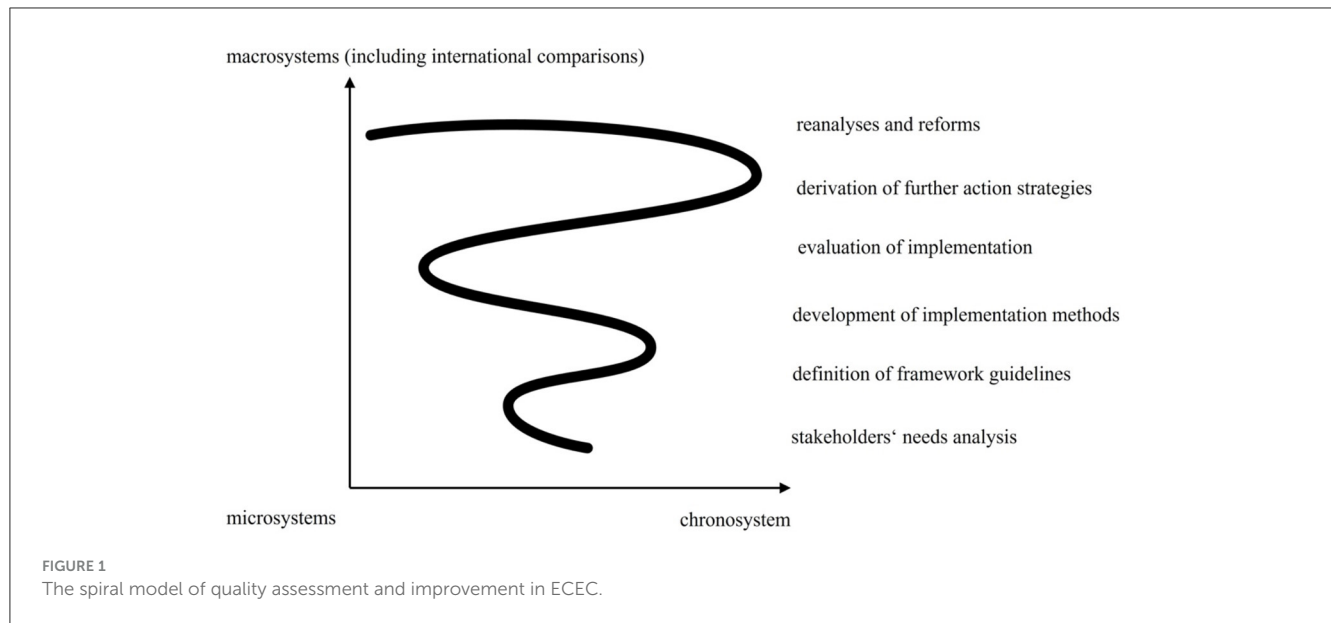
articles in this section draw on *NQS Assessment and Rating* (A&R) data made available by the *Australian Children's Education and Care Quality Authority* (www.acecqa.gov.au). Davis et al. used Leximancer semantic mapping to examine changes in educators' documented *Quality Improvement Plans* over two rounds of *NQS A&R*. The findings showed that greater emphasis was given to management, leadership, and professional development in centers that had improved from working toward to exceeding NQS. Char et al. analysis of systems-level predictors of quality in home-based ECEC services provides further evidence of the critical role of governance in supporting quality outcomes.

Five articles address *Professionalization and Quality Improvement* issues by exploring various stakeholder engagement strategies. Embacher and Smidt's survey of Austrian preschool teachers investigated the relationship between professional competencies (e.g., work engagement) and the quality of observed teacher–child interactions, assessed using the individualized *CLASS* (inCLASS) version. Irvine et al. used a case study methodology to gather insights from ECEC providers, leaders, and educators. Their study focused on experiences of the NQS A&R process, particularly working in centers that had improved their NQS ratings. Siraj et al. implemented a randomized controlled trial (RCT) methodology to test the "Leadership for Learning" professional development program. This program aimed to improve the quality and development outcomes of preschool-aged children in Australia. Using quantitative and qualitative methods, Buchner et al. evaluated the effectiveness of intercultural "anti-bias" training and reflection sessions among a group of German educators. Boese et al. tested the effectiveness of professional language support training for educators working with bilingual children in Germany using an intervention vs. historical control group comparison.

Overall, the collection of articles in this Research Topic is crucial for governments, ECEC providers, teachers, educators, and the scientific community. This Research Topic emphasizes the role of stakeholders in research that aims to measure, understand,

achieve, and improve the quality of ECEC services. It also highlights the critical importance of professional learning in fostering quality practices and supporting children's learning, development, and wellbeing. These scholarly articles contemporize best practices and propose new solutions for conceptualizing, measuring, and enhancing ECEC quality.

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LH: Conceptualization, Writing – review & editing. AB: Conceptualization, Visualization, Writing – original draft. HL: Conceptualization, Writing – review & editing.

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Engaging stakeholders to inform policy developments in early childhood education and outside school hours care

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The application of engagement strategies to ensure democracy of decisions is increasingly valued and adopted by governments to ensure trust in the process and ownership of the outcome. This paper describes the approach and methods used to engage early childhood education and care (ECEC) and outside school hours care (OSHC) stakeholders in the contemporizing and updating of Australia's national Approved Learning Frameworks (ALFs): *Belonging, Being and Becoming: The Early Years Learning Framework for Australia* (EYLF) and *My Time Our Place: Framework for School Age Care* (MTOP). Theoretical underpinnings of a robust stakeholder engagement strategy ensured a range of methods were developed to communicate with and encourage participation by the diversity of stakeholders who are invested in ECEC and OSHC in Australia — broadly defined as approved providers, teachers, educators, families, children and young people, regulatory authorities and other professionals who provide support and advice. A mixed-method, sequential 3-Stage design was developed to gather the insights, responses, and perspectives of stakeholders who provided, worked in, used, attended, or supported ECEC and/or OSHC settings. Stakeholder feedback included survey ratings and written comments, focus group and panel discussions, educator documentation and video-diaries, and the writings, talking, and drawings of children and young people. Evaluation methods focus on the number, diversity, and depth of stakeholder responses. In conclusion, we reflect on the usefulness, benefits, limitations, and effectiveness of our approach to participatory engagement to inform government policy development and decision making.

KEYWORDS

education and care, stakeholder engagement, policy, early childhood, participation, multi-method, outside school hours care

1 Introduction

Australian National Law requires licensed providers of education and care, better known as 'approved providers', to ensure that a program is delivered to all children being educated and cared for by the setting that is based on and delivered in accordance with an Approved Learning Framework (ALF) (Australian Government Department of Education Employment and Workplace Relations, 2009). There are two national ALFs legislated under the Australian

National Quality Framework (NQF) (Australian Government Department of Education Employment and Workplace Relations, 2009, 2011) for the education and care of children and young people:

- Belonging, Being and Becoming: The Early Years Learning Framework for Australia (EYLF) – for young children from birth to 5 years (Australian Government Department of Education Employment and Workplace Relations, 2009)
- My Time, Our Place: Framework for School Age Care in Australia (MTOP) – for school age children (Australian Government Department of Education Employment and Workplace Relations, 2011).

Recognizing the importance of the ALFs remaining contemporary and relevant to ECEC and OSHC settings, in 2021, the State, Territory, Australian Government and Commonwealth Education Ministers commissioned a review and update of the two ALFs. The purpose of the update was to strengthen their contribution to the objectives of the National Quality Framework and their value to the ECEC and OSHC sectors by ensuring greater alignment of the frameworks with current education and care programs, international practice, and research evidence. The update also sought to improve consistency across the two ALFs and, where appropriate, align them with Australian school curriculum requirements, and related areas of policy and practice. To achieve this purpose a national consortium, led by six key writers, was engaged by Australian Children's Education and Care Quality Authority (ACECQA), who are the national body who works with all State/Territory governments, to undertake a comprehensive investigation to identify the aspects of the ALFs that would benefit from refinement. Underpinning the investigative review and update was a robust stakeholder engagement strategy.

2 Why stakeholder engagement is important for policy initiatives and informed decision making

The adoption of participatory approaches in early years policy initiatives and decisions is increasingly viewed as a democratic right necessary for legitimizing policy making at local and national levels (Commission of the European Union, 2001; Gramberger, 2001; Lloyd, 2014). Participatory cycles of involvement resist linear models of policy implementation to support inclusivity (Commission of the European Union, 2001) and active citizenry (Barnes et al., 2007). The International Association for Public Participation (2015), p. 2 is "recognised as the International standard for public participation and practice" for community and stakeholder engagement and responds to the growing shift from governments and policy groups to engage with stakeholders in developing policies or new program initiatives. The association has developed a model - *IAP2 Public Participation Spectrum* (International Association for Public Participation, 2019) which supports organizations to involve stakeholders "affected by a decision to have a say in the decision-making process" (2015, 3). IAP2 argues acknowledging context-responsive engagement strategies means moving beyond one-dimensional methods of expert delivery of a question (s), to consider community motivations for engagement (internal or external), how responsibility is dispersed, and the nature of communications as contributions to impact outcomes (International

Association for Public Participation, 2015). Another model - the International Finance Corporation's (IFC), Good Stakeholder Engagement (International Finance Coperation, 2007) model, is a sustainable stakeholder engagement framework with planning and implementing tools and approaches focused on building relationships and communication with community stakeholders to ensure issues are identified, information is shared, and consultation processes integrated. This model supports the formation of partnerships, stakeholder feedback, and reporting across the project, as well as the management of processes, timelines, and progress (International Finance Coperation, 2007). Researchers in the health sector, such as Bird et al. (2021) note drawing on diverse perspectives serves to enhance creative solutions and innovative ideas as multiple sides of the same issue are brought to the fore. Therefore, engagement strategies and analysis must keep in mind differing community needs, ideas, and expectations to ensure interpretations and recommendations are reflective of all voices (Bird et al., 2021).

While there are emerging stakeholder engagements occurring in ECEC research (e.g., see Irvine and Farrell, 2013; Degotardi et al., 2019; Waniganayake et al., 2019) this is limited in OSHC research. Dissemination of the benefits of these collaborations are also rare but the few available studies that have documented this process, provide crucial insights into political forces impacting processes of co-production and dissemination. Beginning with the Australian-based study of Caldis (2014) involving Australian Geography Teachers Association (AGTA), the extent of the AGTA's influence on development of the Foundation to Year 10 geography curriculum was analyzed. While the influence of this professional body was felt, "the increasingly political nature of curriculum development" meant that as a negotiated document, final decision-making rested within the "political jurisdiction" of "each state and territory" (Caldis, 2014, p. 58). Similarly, the England-based research of Lloyd (2014) and that of Vasconcelos (2013) conducted in Portugal provide crucial insights into political forces impacting processes of co-production and dissemination. Beginning with Lloyd, participatory models of engagement introduced by the Department for Education (2013) were found to be problematic, with inconsistent co-production in published early years policy (Department for Education, 2013) and the top-down withdrawal of ministerial political support creating a lack of stakeholder input (Lloyd, 2014, p. 134). Lloyd (2014) argues this resulted in diminishing sector enthusiasm to participate in future policy development and public skepticism of policy proposal benefits (Jozwiak, as cited in Lloyd, 2014).

Looking at the work of Vasconcelos (2013), stakeholder participation via the National Council for Education (CNE) was sought in the drafting of 11 recommendations in 2011 for improving educational quality aligned with OECD (2006) Starting Strong II principles for children aged birth-three. While the public statement presented by CNE was met with overwhelming approval, change to a conservative government meant public dissemination of the public statement did not occur (Vasconcelos, 2013). While the politics of policy co-production to date appear somewhat disheartening from a stakeholder perspective, Lloyd (2014), p. 135 notes that despite political 'blockers' put in place to limit the strength and power of co-production, evidence suggests engagement in the process has itself "generated greater awareness among the early years sector of the power and potential of an alternative group-based influencing mechanism." Likewise, Caldis (2014), p. 58 offers some hope in

acknowledging the importance of bodies such as the AGTA contributing to curriculum development processes despite ultimate responsibility resting in the political domain.

Other researchers such as Degotardi et al. (2022) posit that engagement processes that allow for multidisciplinary voices empower stakeholders and provide avenues of communication sometimes not offered to families, young people, and children from diverse backgrounds. Effective stakeholder engagement brings together context responsive "strategies and processes" (Rogers et al., 2022, p. 1133) with purpose based on shared interest, change action, place specific concerns, shared practice and activities, or collective response to an external circumstance (Millington, 2010). Co-designed approaches with the end user involvement are also critical (Bird et al., 2021).

2.1 Engagement approach for the ALFs Update project

Adapting strategies and processes from International Finance Coperation (2007) and International Association for Public Participation (2019) models to reflect ECEC and OSHC contexts, as well as the documented studies outlined above the engagement processes identified (see principles 1–8 below) guided the research approach and design of the ALFs Update project. These principles served to strengthen communication networks, collegiality, and engagement in the ECEC and OSHC sector by striving for positive outcomes for children and young people, and other stakeholders. The engagement process actively sought the views and advice of Aboriginal and Torres Strait Islander peoples across all stages. The ALFs Update stakeholder engagement approach was values-based and guided by the following eight principles:

1. Inclusion – To maximize engagement with individuals, settings and organizations involved in or with an interest in the provision of high quality, inclusive ECEC and OSHC settings across all jurisdictions tailored and targeted strategies were adopted to encourage and facilitate diverse stakeholder perspectives.
2. Respect – In recognition and respect for diversity in education and care and the broader community, we sought to encourage and facilitate diverse perspectives to inform the ALF updates, with a view to supporting better decision-making.
3. Accessibility – Commitment to providing open access to user-friendly information and consultation tools to enable diverse stakeholder engagement.
4. Ethical collection and use of data to ensure all methods, collection and use of data were guided by the principles of the National Statement on Ethical Conduct in Human Research (National Health and Medical Research Council, 2018a), the Ethical conduct in research with Aboriginal and Torres Strait Islander Peoples and Communities: Guidelines for Researchers and Stakeholders (National Health and Medical Research Council, 2018b) and the Early Childhood Australia Code of Ethics (Early Childhood Australia, 2016).
5. Positive and strengths-based approach – Our engagement approach was underpinned by a positive and strengths-based

view of the two ALFs, a shared purpose in ensuring their ongoing currency and relevance within diverse Australian ECEC and OSHC settings and communities.
6. Timeliness – Our communication and engagement strategies were embedded from the beginning of the project and integrated across all three stages of the project to allow multiple opportunities for stakeholders to review information and to reflect, consider and share their perspectives.
7. Transparency – Engagement with stakeholders in dialog connected policy, research, and practice to support informed feedback and decision-making.
8. Collegiality and collaboration – At the heart of the project, collegiality and collaboration underpinned all communication and engagement activities. Stakeholder input was valued and considered.

3 Stakeholder engagement approach and research design

The ALFs are generally highly regarded in Australia and, increasingly, as exemplars of good policy practice internationally (Barblett et al., 2021). It was important when refreshing these national frameworks that stakeholders were engaged to garner a wide range of perspectives from different user interface points. This encompassed insights from those who used the ALFs in their program and planning, voices of children and young people attending settings, views of families who utilise the settings and community members with connections to the sector and/or settings. Within the context of the 2021 National Quality Framework (NQF) ALFs Update project, 'engagement' meant that stakeholders can play a meaningful role in informing policy decision-making through the provision of proactive, timely and user-friendly information and multiple opportunities to voice their opinions throughout the three Stages of the project.

The Stakeholder Engagement Strategy informed a coordinated, timely and focused sequence of diverse engagement activities designed to inform and facilitate two-way communication about the ALFs Update, and to encourage and enable the participation of a wide diversity of stakeholders. The objectives of the stakeholder engagement strategy were to:

- communicate and build sector awareness of the ALFs Update project, including the purpose, scope and value of the project, and ways for stakeholders to have input into the policy decision-making process.
- gather authentic contextualized data from the ECEC and OSHC sector to inform the updates of the two ALFs.
- enable children and young people to have a voice in determining changes and updates to the ALFs.
- critically evaluate stakeholder feedback informed by contemporary research and practice.
- consult with the governments' ALFs update steering committee and ACECQA.
- facilitate a dialog with the ECEC and OSHC sector that supports stakeholder understanding of proposed changes and a shared sense of ownership of the final approved updated ALFs.

A participatory approach to facilitating stakeholder engagement was adopted, including universal and targeted strategies and a mix of open-ended and focused engagement tools to identify gaps in the ALFs and invite new ideas. The project progressed through a sequence of three Stages. In Stage 1, the six lead writers (Hadley, Harrison, Irvine, Barblett, Cartmel and Bobongie-Harris) developed a set of online surveys for families, educators, other professionals, and approved providers to ascertain the strengths, gaps, and silences of the two frameworks and priorities for updating. In addition, online focus groups with state/territory policy and regulatory officers were held, and multi-modal methods were developed to gather children and young people's voices. In Stage 2 a discussion paper with 20 recommendations for updating the ALFs, based on the analysis of Stage 1 data and a review of international literature and curriculum frameworks (Barblett et al., 2021), was developed and circulated. Stakeholder feedback on the 20 recommended areas was gathered through online surveys, written submissions, methods to gather children's voices, and a series of Delphi panel discussions with invited representatives of sector stakeholders. In Stage 3 drawing on the consolidated analysis of Stages 1 and 2, the six lead writers who buddied with six practitioners wrote the draft updates for the EYLF and MTOP. These documents were piloted in 16 ECEC and OSHC settings across Australia. Feedback from the participating leaders, teachers, educators, and children were gathered through weekly video-diaries, pedagogical documentation and focus groups, and analyzed using qualitative methods to inform the evaluation of the updated EYLF and MTOP. This paper describes and reflects on the methods, approaches and strategies used in all stages to engage with stakeholders and gather feedback from them to inform the updates.

Table 1 outlines the engagement approach for the 2021 NQF ALFs Update project. Our strategy was informed by several engagement models including the International Association for Public Participation (2019) and International Finance Coperation (2007). The mapping in this table shows that while the level of engagement with particular stakeholders varied, overall, the engagement included all five categories: Notify; Confer; Engage; Work together; and Enable informed decision making, which are discussed next. The goal of the

engagement was to obtain stakeholder feedback on analysis, alternatives, and decisions.

Stakeholders were informed, listened to, and received acknowledgement of their perspectives and contributions. In the next section, we outline how this was enacted for each engagement strategy category.

3.1 Notify

In this category the purpose was to provide balanced and objective information and disseminate widely with all stakeholders in the sector. This was achieved through a designated website and key presentations to stakeholder groups.

3.1.1 Website and email distribution list across all stages

Lee-Geiller and Lee (2019), p. 208 argue that a "website should facilitate democratic processes involving not only information sharing and delivery of better public services, but also deliberation and coproduction." To both disseminate information and engage stakeholders in the consultation process across all three Stages the website provided clear entry points for ECEC and OSHC for family members and communities, educators and approved providers, and other stakeholder organizations. The website was designed to ensure inclusion, respect for and accessibility of diverse perspectives, as well as feedback loops that demonstrated how stakeholder engagement had informed the updates being made. The updates on each stage of the project were provided on the website, which included videos for the stakeholders, as well as animations pitched at children and young people. This information was also disseminated via an extensive email distribution list which included services and providers, regulatory authorities, teacher regulatory authorities and curriculum bodies, peak bodies (national, state and territory, large/medium service providers, unions, child and family organizations, and other key groups). Bespoke social media communication was also used to attract stakeholders to the website. ACECQA distributed these media

TABLE 1 2021 NQF ALFs update engagement strategy.

	Notify	Confer	Engage	Work together	Enable informed decision making
Components to engagement strategy	Deliver transparent and objective information to assist understanding of the problem, strengths and weaknesses and potential resolutions	Collect feedback on the problem, strengths and weaknesses and potential resolutions	Work with stakeholders to ensure their feedback and potential resolutions are comprehended and reflected upon	Collaborate with stakeholders on the decisions including alternative resolutions	Empower stakeholders with final decision-making and resolutions
ALFs methods	• Website and email distribution (Stage 1, 2, 3) • Presentations to key organizations and stakeholders (Stage 1 & 2)	• Literature review (Stage 1) • Authorized Officer focus groups (Stage 1) • Surveys (stage 1 & 2) • Stakeholder submissions (Stage 2)	• Delphi Panels (Stage 2) • Pilot sites (Stage 3) • Focus groups (Stage 3) • Children and young people (Stage 1, 2, 3)	• Consortium members and practice buddies (Stage 1, 2, 3) • ACECQA and Steering Committee (Stage 1, 2, 3)	• Discussion paper for stakeholders (Stage 2) • Final report to Steering Committee (Stage 3)

communications through their networks as well. Ensuring there were feedback loops provided regular progress updates and a rationale for the recommended updates to build shared understanding of the decision-making process and shared ownership and transparency of the project outcomes and updated ALFs.

3.1.2 Presentations to key organizations and stakeholders in stages 1 and 2

These presentations occurred via key stakeholder meetings and conference or symposium presentations by consortia members which both advertised the project, disseminated the findings from the Stages so that stakeholders could engage with the process to ensure they felt informed and included throughout the 15-month project.

3.2 Confer

Conferring with all stakeholders was seen as critical in obtaining their input and feedback throughout all Stages of the project. We employed four key strategies to reach this objective.

3.2.1 Literature review in stage 1

The purpose of the literature review was to provide a concise review of contemporary Australian and international literature, empirical evidence and ECEC and OHSC curricula to identify potential areas for updating the ALFs. The literature review (Barblett et al., 2021) was disseminated widely as part of the Accessibility and Transparency principle and notify strategy, adding strength to the analyses emerging from the surveys and other sources of data informing the Stakeholder Discussion Paper for Stage 2.

3.2.2 Regulatory officers (RO) focus groups in stage 1

These are the people in each jurisdiction who assess ECEC and OSHC settings in relation to the NQF. Focus groups were conducted with the ROs to glean insights on areas for updating the EYLF and MTOP based on their interaction with services through the Assessment and Rating process, concentrating on QA1 Educational Program and Practices for ECEC and OSHC settings. The focus group framework was informed by findings from the recent National Quality Improvement project (Harrison et al., 2023). The focus groups were designed to capture the "what, "who" and "how" in relation to the current strengths and priorities for updating in the ALFs which then informed the Stage 2 Stakeholder Discussion Paper.

3.2.3 Surveys in stages 1 and 2

Addressing the principles of inclusion and accessibility the surveys provided an easy to understand method for gathering feedback from a wide and diverse range of stakeholders. These included family members, educators and approved providers, and other stakeholder organizations, Aboriginal, Torres Strait Islander and Australian South Sea Islander peoples and communities, culturally and linguistically diverse families and communities and families with children with additional needs. Survey 1 focused on strengths or concerns regarding the current frameworks, and suggestions for additions or changes to the EYLF and MTOP, including top priorities for the future. Using the analysis of the data from Phase 1, survey 2 used a series of reflective questions, using

rated scales and open-ended comments, to gather responses to components of the stakeholder discussion paper which would guide the updates to be piloted in Stage 3. The surveys were translated into five community languages to engage culturally and linguistically diverse families and communities. The surveys were designed to collect demographic information on the participants, and characteristics of the ECEC and OSHC settings the participants worked in, provided, or used. This allowed for fine-grained as well as broad-brush analyses of the quantitative and qualitative data.

3.2.4 Stakeholder submissions in stage 2

In stage 2 stakeholders had the option to submit a written submission which provided an opportunity for stakeholders to present their responses and rationale for their views as a more formal written response. This option was used by individuals and organizations, with many responding to particular recommendations within the discussion paper. This approach related to the engagement principles of Inclusion; Accessibility; Timeliness; and Collegiality and collaboration.

3.3 Engage

Engaging directly with stakeholders was seen to be a critical component of the engagement principle of Collegiality and collaboration to ensure their aspirations were understood and considered. There were four key strategies we implemented for this stage of the engagement strategy.

3.3.1 Delphi panels in stage 2

Based on an adapted Delphi panel model (Crisp et al., 1997; Green, 2014), these panels brought together a purposeful mix of people with experience, expertise, and leadership in ECEC and OHSC curriculum, pedagogy, and practice to consider the Stage 2 consultation outcomes. These panels provided a communication structure for critical examination of stakeholder feedback to generate prepared and supported decisions. This strategy is linked specifically to the engagement principles of Inclusion; Respect; Transparency; and Collegiality and collaboration.

3.3.2 Pilot sites in stage 3

Analysis and synthesis of sector feedback on the recommended changes and improvements described in the Stakeholder discussion paper (Stage 2) resulted in draft recommendations for the pilot and methods for testing these Updates. To test these proposed updates of the EYLF and MTOP we worked with 16 ECEC and OSHC settings across all jurisdictions in Australia. This strategy linked to all eight engagement principles.

3.3.3 Focus groups in stage 3

At the completion of the 6-week pilot we conducted focus groups with the educators in these 16 sites to elicit high level practitioner informed feedback on the efficacy of the changes and improvements in the ALF Updates. These focus groups provided insights and advice on the implementation processes and challenges for educators, children, and families which informed recommendations in the final report for the States, Territories, and the Australian Government.

3.3.4 Children and young people in all stages

Respecting children and young people as informed contributors to the updating of the ALFs, we sought to uphold their right (Article 12, UN CROC) to participate in decision-making that affects their lives. The methods used to gather children's voices have been described elsewhere (see: Barblett et al., 2022; Cartmel et al., 2023) but it included engagement with children and young people of all ages (1–12 yrs), Aboriginal, Torres Strait Islander and Australian South Sea Islander children, children from culturally and linguistically diverse backgrounds; and children with additional needs.

3.4 Work together

To ensure that updates were informed by the sector it was critical that we partnered with stakeholders in each aspect of the decision making. This happened across all three Stages and included two key strategies to achieve this. These strategies linked specifically to the engagement principles of Inclusion; Respect; Transparency; and Collegiality and collaboration.

3.4.1 Consortium members

A large group of 42 people that represented all jurisdictions and included both EYLF and MTOP experts formed the consortium. The consortium comprised six lead writers who were buddied with six practitioners, transdisciplinary and consortium expert groups, lead educators and their teams in 16 pilot sites. This group facilitated targeted engagement with diverse stakeholders across all three stages and supported the evaluation of all evidence (research and practice) to inform the final recommendations for updating the EYF and MTOP. The six practice buddies worked closely with the six key writers to write the updates to both frameworks. The approach taken is supported by researcher such as Farrell et al. (2021), p. 2 who argue 'research-practice partnerships' provide opportunities for "locally driven, collaborative approaches to research in support of educational equity."

3.4.2 ACECQA and steering committee

ACECQA appointed a Project Manager who was a key conduit between the six key writers and the ALFS Steering Committee. This position facilitated a collegial and collaborative relationship, whereby ACECQA liaised with ECEC and OSHC government representatives from every state and territory alongside the federal departments that assisted with the final decision-making process by - the education ministers for the relevant state, territory, and commonwealth government departments. The meetings were planned across the 15-month project and the Project Manager and lead Chief Investigator (first author) also met weekly to facilitate the engagement strategy.

3.5 Enable informed decision making

This part of the engagement strategy was about placing the final decision-making in the hands of stakeholders, linking with the Collegiality and collaboration principle. There were two key strategies implemented to achieve this.

3.5.1 Discussion paper in stage 2

The Discussion Paper identified current strengths as well as 20 opportunities for clarification, expansion and updating the ALFs. To gather targeted feedback and enable informed decision making from a diverse range of stakeholders there were two Discussion Papers to ensure content was accessible (Principle 3). Firstly, a more detailed paper for educators and stakeholders working in ECEC and OSHC services identifying current strengths as well as 20 opportunities for clarification, expansion and updating the ALFs. The other was an abridged version for families that outlined 13 opportunities for clarification, expansion and updating. The two Discussion Papers ensured all stakeholders were able to provide feedback on what the updates should include. These were then tested in Stage 3 – pilot sites.

3.5.2 Final report and updated ALFs submitted to steering committee in Stage 3

To inform the Steering Committee and the Education Ministers the final report included the findings of Stage 3, the updated EYLF and MTOP, and a recommended implementation plan for the sector. This report enabled the key government stakeholders to make an informed decision about the final updates to the EYLF and MTOP.

3.6 Ethical considerations

In terms of ethical approvals these were granted by the University Ethics Committees that the researchers worked at (52021991827988 and 20210009395). Across all three Stages explanations about consent were explained and for children and young people, assent as well. All responses were de-identified.

4 Evaluating the effectiveness of our approach

Our evaluation of the effectiveness of engagement with stakeholders was based on the results of three strategies – (1) Notify, (2) Confer, and (3) Engage, which together were the vehicles for strategies (4) Work together, and (5) Enable informed decision making. Our evaluation methods focused on the number, diversity, and depth of stakeholder responses which are outlined next.

4.1 Notify

Two communication strategies were evaluated by their reach and response rates from stakeholders.

4.1.1 Direct email, social media, media, newsletters

In Stage 1, the Chief Investigators and Consortium Members sent personal emails to over 230 stakeholders from ECEC, OSHC, peak bodies, unions and child and family organizations and used their Twitter accounts and Facebook sites to promote the ALFs Update website.[1] Twitter postings were re-tweeted by recipients, resulting in 10,800 unique hits to the ALFs Update website in the early weeks of

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1   https://www.mq.edu.au/faculty-of-arts/departments-and-schools/macquarie-school-of-education/our-research/research-groups/approved-learning-frameworks-update

the project (13/06/2021–4/07/2021). Users of the website were from every capital city in Australia (Sydney, Melbourne, Adelaide, Hobart, Canberra, Perth, Brisbane, Darwin) as well as many regional towns. A total of 280 people registered their email through the ALFs website to receive future updates. Website FAQs were a key feature, with 188 unique page views and an 185% increase in traffic. Website users represented a diverse age range, with the majority being females aged 25–34 (see Figure 1).

In Stage 2, emails were sent to 280 contacts who had registered on the website for updates on the project. An additional 230 stakeholders from ECEC, OSHC, peak bodies, unions and child and family organizations were emailed personally by the six key writers and Consortium Members. Twitter and Facebook were utilized to promote the ALFs Update Discussion Paper and invite stakeholders to provide feedback via surveys and/or submissions. Newsletters and articles announcing the launch of the Discussion Paper were published by ACECQA, Departments of Education, and stakeholder organizations; e.g., https://thesector.com.au/2021/08/30/approved-learning-frameworks-update-project-seeks-stakeholder-feedback-for-stage-2/. These efforts generated 13,700 unique page views of the ALFs website during the Stage 2 feedback period (22/08/2021–19/09/2021) with an increase in traffic of 761.9% over the 4-week period. A further 243 people registered their email through the ALFs website, to receive future updates. Users of the website came from every capital city and many regional towns. The demographic distribution of Stage 2 users was similar to the distribution for Stage 1.

4.1.2 Presentations to key organizations and stakeholders

The six key writers received many invitations to present on the ALFs Update project from peak bodies and ECEC and OSHC organizations. In Stage 1 and Stage 2, the six key writers gave 22 face-to-face and online conference and symposium presentations that reached over 4,500 participants. These presentations not only provided information about the Updates and the ways in which stakeholders could engage and offer feedback, they were also an opportunity for stakeholders to share and discuss their opinions on the Updates and the recommendations outlined in the Discussion Paper.

The effectiveness of these notification strategies was further evidenced by unsolicited emails and verbal feedback from organizations and individuals who commented on how inclusive

FIGURE 1
Website users.

(Principle 1) our approach was and offered their support in disseminating information about the project (Principle 8).

4.2 Confer

Four data collection strategies were evaluated by their reach and response rates from stakeholders.

4.2.1 Focus groups

In Stage 1, a total of 27 Regulatory Officers, early education advisers and other policy colleagues participated in three online focus groups with representation from the eight state and territories and the federal Australian Government. Drawing on their experience of the National Quality Standard assessment and rating process, the aim was to elicit their unique insights on strengths, gaps, challenges, and priorities for updating in both ALFs. These focus groups were facilitated by two members of the research team, using a loose framework of semi-structured questions to engage participants in a professional conversation.

4.2.2 Surveys

In Stage 1, the online surveys were accessed by a total of 3,496 ECEC and OSHC service providers, educators, families, and other professionals who provided ratings on the importance for their work, or their children of the EYLF and MTOP vision, principles, practices, and learning outcomes. They also rated the usefulness and their overall satisfaction with the current frameworks, and were invited to provide written comments to explain their ratings or respond to questions about priorities for change or other suggestions. Responses represented views of stakeholders from all states and territories, and all types of ECEC and OSHC services (See Figure 2).

The Stage 2 surveys invited feedback on 20 recommendations in the Discussion Paper for updating the ALFs and were accessed by 2,637 stakeholders. The survey for approved providers (AP), educators and other professionals who were directly or indirectly involved in the provision or ECEC or OSHC services was completed by 1,623 participants. The survey for families who use ECEC and/or OSHC services was completed by 310 participants. Participants were representative of all types of ECEC/OSHC services, including Family Day Care (FDC), Child and Family Services (CFS) and other services, and all states and territories (see Table 2).

4.2.3 Submissions

A total of 65 written submissions were received, with representation from every Australian state and territory. Submissions were received from ECEC and OSHC, Peak Bodies, Registered Training Organizations (RTO), Individual/Stand-alone Services, Large Provider Organizations, Universities and/or academic teams, as well as from individuals. The distribution is summarized in Table 3, and identifies feedback received from Aboriginal and Torres Strait Islander (ATSI) stakeholders. Note that individual submissions could refer to a combination of service types.

4.2.4 Children and young people

Engagement with children and young people was facilitated in Stage 1 by the 11 Consortium practice buddies and practitioner leaders who worked in ECEC and OSHC settings. A total of 102 children from
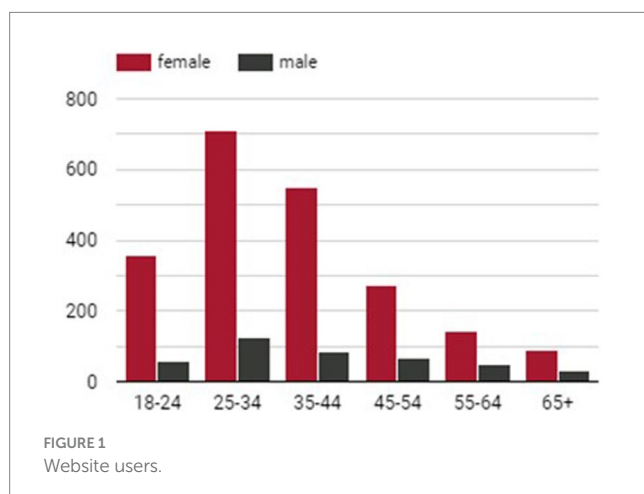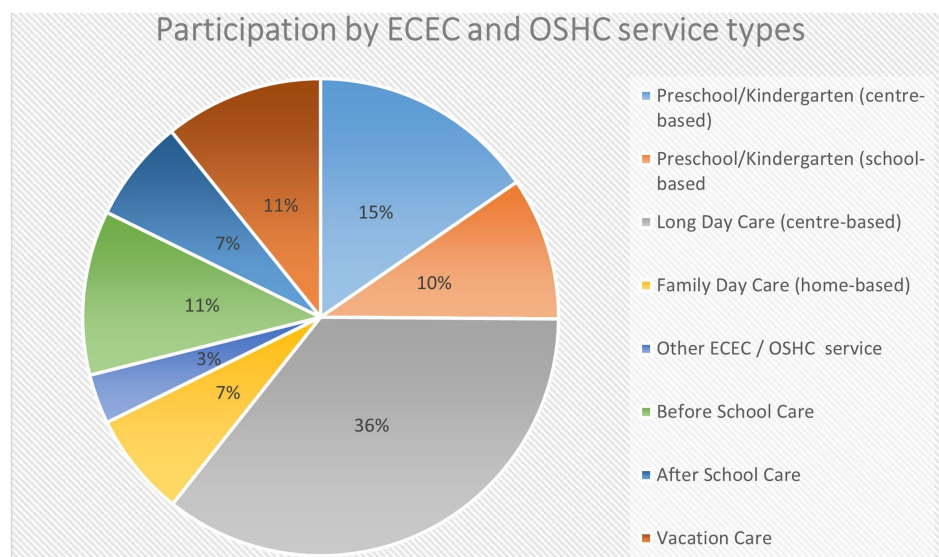
FIGURE 2
Stage 1 survey.

TABLE 2 Stage 2 survey participation by service type and state/territory jurisdiction.

	AP/educator/other professionals					Families			
	TOTAL	ECEC services	OSHC services	ECEC & OSHC		TOTAL	ECEC services	OSHC services	ECEC & OSHC
				FDC/CFS	Other				
Australian Capital Territory	90	69	13	7	1	15	10	2	3
New South Wales	718	445	186	72	15	164	63	83	18
Northern Territory	36	17	5	10	4	6	3	2	1
Queensland	227	113	76	29	9	86	61	18	7
South Australia	78	44	22	10	2	5	2	2	1
Tasmania	30	12	6	11	1	1	0	0	1
Victoria	302	205	59	30	8	29	24	3	2
Western Australia	97	76	15	5	1	4	3	1	0
Multiple jurisdictions	45	19	10	15	1				
TOTAL	1,623	1,000	392	189	42	310	166	110	33

ECEC settings, including preschool/kindergarten, long day care centers, and FDC homes, and 51 children/young people attending an OSHC setting contributed their perspectives. In Stage 2, children and young people from these 11 settings along with ECEC and OSHC settings across Australia were invited to participate. Participation was facilitated by their familiar educators, who were invited to view an animated video on the ALFs Update website that gave detailed instructions for collecting the children and young people's voices.[2] A total of 506 children and

young people from ECEC and OSHC settings contributed their perspectives across the three stages, which included responses from children and young people who identify as Aboriginal and Torres Strait Islander. The distribution of responses by jurisdiction is shown in Figure 3.

4.3 Engage

Three strategies were employed to engage and work directly with stakeholders: Delphi Panel Discussions, Piloting the updated ALFs, and Focus Groups.

2   https://www.youtube.com/watch?v=QZ0T9PQ33-g

TABLE 3 Stage 2 written submissions by service type and state/territory jurisdiction*.

State / territory	ECEC services	OSHC services	Peak bodies	RTO	Stand-alone services	Large provider organization	Other	ATSI	Total per jurisdiction
Australian Capital Territory	3	1	0	1	2	0	1	0	4
New South Wales	21	17	3	5	11	6	5	3	30
Queensland	4	1	0	2	2	1	0	0	5
South Australia	1	1	0	0	0	1	0	0	1
Tasmania	2	2	1	0	1	1	0	0	2
Victoria	3	1	2	2	0	0	0	1	5
West Australia	4	3	2	1	0	1	2	0	6
Northern Territory	1	1	0	0	0	0	0	1	1
Federal / multiple jurisdictions	9	6	3	1	0	1	5	1	10
Not specified	1	0	0	0	1	0	0	0	1
TOTAL = 65	49	33	11	12	17	11	13	6	65

*Individual submissions could refer to a mix of service types; also, ATSI representation is independent of the other columns.
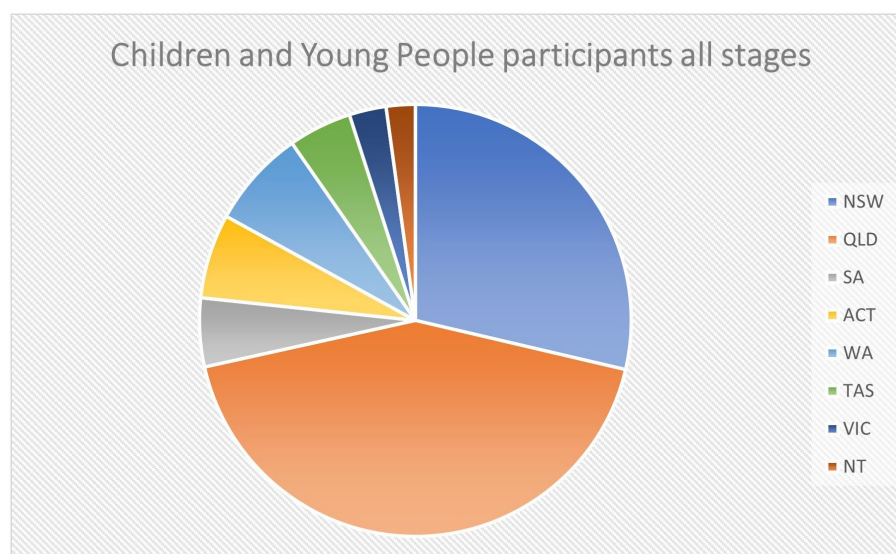
FIGURE 3
Children and Young people participants all stages.

4.3.1 Delphi panel discussions in stage 2

Stage 2 held two rounds of Delphi Panel discussions. The first round involved 146 participants over five panels, each with a purposeful mix of ECEC and OSHC researchers, practitioners, and professionals from diverse contexts (e.g., policy, peak bodies, unions) and locations (metropolitan, regional, rural) across state and territory jurisdictions. Key areas that were explored in the discussions were: critical reflection; embedding Aboriginal and Torres Strait Islander perspectives, learning outcomes related to children's identity, and accessible professional language.

The second round was held with the six key writers and Consortium members (discipline experts, lead researchers and practitioners) to collaboratively reflect on Stage 2 feedback, including key themes emerging from the first round of Delphi Panels. Discussions concentrated on priorities that emerged in the analysis of Stage 2 surveys, submissions, and children/young people's

TABLE 4 Service characteristics of Pilot Settings.

Type of Provider	State/Territory	Location	ATSI	CALD	Disability	Type
Not-for-profit	ACT	Metro	Yes	Yes	Yes	LDC
Not-for-profit	NSW	Metro	No	Yes	Yes	LDC
Not-for-profit	NSW	Metro	No	Yes	Yes	LDC
Not-for-profit	NSW	Regional	Yes	Yes	Yes	Kindergarten/ Preschool (standalone)
Not-for-profit	NT	Remote	Yes	Yes	No	LDC/OSHC
Not-for-profit	QLD	Regional	Yes	Yes	Yes	OSHC
Not-for-profit	QLD	Remote	Yes	Yes	Yes	OSHC
Not-for-profit	QLD	Remote	Yes	Yes	Yes	Kindergarten/ Preschool (standalone)
Not-for-profit	QLD	Metro	No	No	Yes	FDC
Not -for profit	SA	Metro	No	Yes	Yes	FDC/OSHC
For profit	SA	Metro	No	Yes	Yes	LDC
Government operated	TAS	Regional	Yes	Yes	Yes	Kindergarten in school
Not-for-profit	TAS	Regional	Yes	Yes	Yes	OSHC
Not-for-profit	VIC	Metro	Yes	Yes	Yes	Kindergarten/ Preschool (standalone)
For profit	VIC	Regional	No	Yes	No	LDC
Government operated	WA	Metro	No	Yes	Yes	Kindergarten in school

perspectives, giving particular attention to those areas where the proposed changes were considered more complex and/or where there were differences in views.

4.3.2 Pilot sites in stage 3

The Stage 3 pilot invited educators and educational leaders from 12 ECEC, 2 OSHC and 2 ECEC/OSHC settings to engage with the recommended updates to the EYLF and MTOP. The pilot settings included 11 lead practitioners who were members of the ALF Consortium and four settings that were purposely selected to strengthen the diversity of the pilot. Table 4 outlines the distribution of the 16 sites according to type of service (LDC – long day care, kindergarten/preschool, FDC – family day care, OSHC); provider management type (private for profit, not for profit, government operated); Jurisdiction; geographic location (metropolitan, regional, remote); cultural context (ATSI – Aboriginal and Torres Strait Islander and CALD – culturally and linguistically diverse backgrounds); and the provision of services for children with a disability.

A total of 115 educators and educational leaders participated in the 6-week pilot, and collectively provided 277 examples of their curriculum documentation, 91 video diaries, and 191 examples of documentation produced with or by the children and young people in their setting.

4.3.3 Focus groups (stage 3)

At the conclusion of the pilot, the six lead writers hosted 11 online focus group discussions to provide a forum for participants to share their views and experiences of using the updated EYLF/MTOP. The

80 participants included AP, educational and setting leaders, early childhood teachers and ECEC educators, FDC educators and OSHC educators.

5 Discussion and conclusion

This article has outlined a conceptual model for engaging stakeholders in updating and/or informing policy documents. Updating the ALFs was both a top-down and bottom-up endeavor. The Australian Government funded this policy update but also required the winning tender to have a clear engagement strategy that gathered diverse stakeholders' perspectives on what should be included in the ALF updates. The approach we took aligned with Farrell et al. (2021), p. iv assertion that research practice partnerships should be "intentionally organized to connect diverse forms of expertise and shift power relations in the research endeavor to ensure that all partners have a say in the joint work." For example the traffic to the ALFs update website, built specifically for this project, and the number of responses gathered across the three Stages illustrate the effectiveness of applying a systematic engagement strategy. Also having a consortium of experts and practitioner buddies who worked closely with the key writers and reviewed all changes made to the updated Frameworks ensured that all expertise was valued.

The eight principles and five categories that guided this strategy (outlined earlier in the paper) ensured that all activities were designed by the consortium to be inclusive, respectful, accessible, ethical, strengths based, timely, transparent, collegial, and collaborative.

Applying these eight principles across the five categories of notifying, conferring, engaging, working together led to informed decision making on updating the ALFs. This approach ensured context-responsive strategies to garner and motivate engagement from a diverse range of stakeholders which is recommended by International Association for Public Participation's (2015) *Quality Assurance Standard for Community and Stakeholder Engagement*. For instance, in relation to inclusivity all videos included closed captioning and an Auslan interpreter to ensure those with a hearing or vision impairment could access the information. Another example included the family surveys being transcribed into five community languages (Arabic, Chinese, Hindi, Korean and Vietnamese) to reflect the diversity of the Australian population. These were translated and fed into the updates. Another example includes the six lead writers operating as '*boundary spanners'* whereby they navigated multiple spaces within the sector to facilitate connections, engagement and feedback. Farrell et al. (2022), p. 198 argues operating across boundaries can "foster social networks, improve communication pathways" to facilitate learnings. Boundary practices (Farrell et al., 2022) were also enacted whereby the lead writers engaged with practitioners, peak bodies and ECEC and OSHC organizations. Fundamental to the design of this project was the inclusion of the six practitioners who acted as writing buddies to the six lead writers. This was another example of boundary crossing to reduce the research-practice divide.

The participatory approach adopted by the consortium to engage diverse stakeholders was also a successful method. The high levels of engagement and buy in across all three Stages provided the consortium with both qualitative and quantitative data that informed the 20 recommended updates. Although this is an emerging approach, previous research has argued for this approach for democracy and to legitimize policy making by including both bottom up and top-down voices (Commission of the European Union, 2001; Gramberger, 2001; Lloyd, 2014). The support from stakeholders, both individuals and larger organizations across all stages of the project illustrates a sense of citizenship which Barnes et al. (2007) argue is essential. The final step, which was the category of enabling informed decision making, was curtailed due to the timeframe set by the Education Ministers who approved the final updated ALFs in December 2022 and released them to the sector in January 2023. However, the six key writers are committed to sharing and discussing the updates with stakeholders and also disseminating the findings through professional and peer reviewed journals.

Although policy shifts establish the need for a clear engagement strategy and robust approach to ensure empowerment, the socio-political contexts shaping policy-making can impact effectiveness (Vasconcelos, 2013; Caldis, 2014; Lloyd, 2014). As an emerging area of scholarship in the ECEC and OSHC context, this paper contributes to the growing body of stakeholder engagement research in early childhood policy. We argue the steps we developed for universal and targeted strategies, with the eight engagement principles and five strategies guiding the processes of this project provide a progressive evaluative framework of engagement. This paper contributes to conceptualizing the effectiveness of an impactful engagement strategy which could guide future researchers and ECEC and OSHC stakeholders in policy development and revisions. This approach could also be adopted for reviewing curriculum and pedagogical

documents within ECEC and OSHC organizations to ensure local and contextually driven policies and practices.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

FH, LH, LB, SI, JC, and FB-H contributed to conception, design of the study, analysis of the data, and engagement strategy. FH, LH, and LL wrote the first draft of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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Serving families who face economic and related adversities: the '5 As' of effective ECEC service delivery

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Introduction: Families with young children who face economic and related adversities are the most likely group to miss out on the advantages of regular sustained participation in high quality early childhood education and care. In Australia, there are an estimated 11% of children assessed by teachers to have two or more developmental vulnerabilities and many of these children are living in economically disadvantaged contexts. Government policy in Australia aspires to provide universal access to Early Childhood Education and Care (ECEC) services to support children's outcomes and ensure workforce participation, but policy falls short of ensuring all families can take up high quality early childhood education and care. Government responses to the Covid crisis saw significant changes to the ECEC policy and funding mechanisms. It is timely therefore to reflect on the level of 'competence' in the Australian ECEC systems. Coined this term to refer to a system that is sustainable, inclusive, and effective for all families.

Methods: Using a Delphi methodology, we coalesced the insights of high-level stakeholders who have expertise in delivering services to families experiencing adversities and noted points of consensus and of divergence among these stakeholders. We have taken up the challenge of considering the Australian system from the point of view of families who typically find services hard to use.

Results and Conclusion: We put forward a model that frames the characteristics of services that can inclusively engage with families - Approachable, Acceptable, Affordable, Accessible and Appropriate. We argue that more needs to be known about appropriateness and what effective pedagogy looks like on the ground for families and children.

KEYWORDS

early childhood education, policy systems, economic disadvantage, families, partnerships

Introduction

Child poverty gets under the skin. It shapes how children grow and what they know. It can trigger chronic, debilitating, enduring health conditions (Boyce et al., 2021). Poverty influences how people on the street and in institutions speak to them and to their family. As one young mother noted: *'teachers judge people like me like a horse – by my teeth and my shoes'* (Skattebol et al., 2014). Poverty dictates the confines of everyday life and limits young children's experiences. Parental income is the key influence on educational trajectories (Spencer et al., 2019; Burley et al., 2022). Despite Australia's significant wealth, one in six Australian children live in poverty with nearly 200,000 of these children living in 'severe poverty' (Duncan, 2022). Whilst Australia

has higher rates of intergenerational income mobility than many other advanced nations, rates of widening income inequality are likely to result in less upward intergenerational mobility in coming generations. Currently, nearly a third of those who experienced childhood poverty themselves are likely to have children who also experience income poverty in their lifetime and this proportion is rising not going down (Corak, 2020). Further, the opportunity for mobility has a regional dimension and is associated with school attendance and the strength of regional labour markets (Deutscher and Mazumder, 2020). Those living in severe poverty are often also living in deep isolation from services and family/friendship networks (Duncan, 2022). There is wide consensus across health, economics and education disciplines that show that intervening early in children's lives is not only critical for the child themselves but it also makes economic sense (Wood et al., 2020). Universal high quality Early Childhood Education and Care (ECEC) holds promise as one of the few rare policy interventions that can offer significant economic and social dividends. As noted by the 2023 Productivity Commission inquiry into universal childcare, "*a great early childhood education and care system pays a triple dividend – it sets children up for a great start in life, helps working families to get ahead, and builds our economic prosperity by supporting workforce participation.*"[1]

This paper will showcase aspects of service delivery that work for families who experience poverty. We coalesce insights from high level policy makers and provider organisations that have experience of delivering effective ECEC services to these families. We address the question of what an effective inclusive service is, offer a framework for thinking through the elements that make services easy to use, and identify gaps in our current policy and practice knowledge.

Investments in equitable ECEC

The last two decades have seen policy makers, providers, practitioners and philanthropists all make considerable efforts to tune policy settings and service design to the needs of families in disadvantage so they can engage with ECEC. Administrative data indicates more children are enrolled in ECEC in the year before school, but these efforts still miss a significant minority of young children (Goldfeld et al., 2022). Whilst policy sometimes rationalises children missing out on ECEC as an effect of parental choice, research demonstrates ECEC service systems are unresponsive *at a macro leve*l and there are structural barriers facing families in disadvantage (Vandenbroeck and Lazzari, 2014).

International reviews of effective inclusive services and interventions shows they are embedded in competent macro, meso and micro systems (Urban et al., 2012). These authors state:

> '**competence**' in the early childhood education and care context has to be understood as a characteristic of the entire early childhood system. The competent system develops in reciprocal relationships between individuals, teams, institutions and the wider socio-political context. A key feature of a 'competent system'

is its support for individuals to realise their capability to develop responsible and responsive practices that respond to the needs of children and families in ever-changing societal contexts. At the level of the individual practitioner, being and becoming 'competent' is a continuous process that comprises the capability and ability to build on a body of professional knowledge and practice and develop professional values. Although it is important to have a 'body of knowledge' and 'practice', practitioners and teams also need reflective competences as they work in highly complex, unpredictable and diverse contexts. A 'competent system' requires possibilities for all staff to engage in joint learning and critical reflection. This includes sufficient paid time for these activities. A competent system includes collaborations between individuals and teams, institutions (pre-schools, schools, support services for children and families…) as well as 'competent' governance at policy level. (p.21).

Australia's mixed market system of ECEC provision does not deliver equity and so cannot be considered a 'competent' system. Studies of Australian ECEC administrative data show that enrolment, attendance, and length of time in programs are proportionally lower in regional, remote, and disadvantaged communities (Hurley et al., 2022). There are lower enrolments in early years services amongst single parent families; families from non-English speaking backgrounds; families with lower levels of education; where both parents are unemployed; families of Aboriginal or Torres Strait Islander descent; and families who live in rural or remote areas or socioeconomically disadvantaged communities (Beatson et al., 2022). Furthermore, the programs and initiatives offered in these settings may be more limited rather than more comprehensive. A recent study showed that meal provision – a basic service offering typically associated with children experiencing food insecurity – *is less likely to occur in disadvantaged regions* than in regions with strong competition for families who can pay high fees (Thorpe et al., 2022).

The Australian government monitors and regulates its marketized system via the National Quality Standard with the aim of improving quality in services. However, National Quality Standard data shows that high quality in educational programming and practice, staffing arrangements and leadership are less common in disadvantaged areas and more common in high income areas (ACECQA, 2021). Settings in disadvantaged areas are more likely to have a waiver on regulations that ensure levels of qualification amongst staff (ACECQA, 2021). One of the largest studies of Australian ECEC quality reported that only 7% of children from low SES families attend services in the top quintile for quality 'instructional support', compared to 30% of children from high SES families (Torii et al., 2017). Siraj et al. (2019) argue that the National Quality Standard tools are not comprehensive enough to scaffold the improvements in practice needed in communities where there are high rates of developmental vulnerabilities.

Whilst the National Quality Standard aims to improve services across the board, a recent study on the predictors of improvement trends over time on a national scale show there is greater quality improvement in the not-for-profit sector (compared to the for-profit sector) and in large multi-site organisations (compared to stand alone providers). The Australian mixed market system is comprised of 51% for-profit providers and 80% of these are operated by stand-alone providers. National Quality Standard improvement trends indicate the system does

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not offer sufficient support for standalone providers to make significant quality improvements over time (Harrison et al., 2023).

Governments have also committed to ensuring each child receives 15 h of early education in the year before school. Improvements in children's outcomes are strongly associated with the amount of time (sometimes discussed as a 'dose' that impacts on outcomes) spent in high quality ECEC. A randomised control trial that delivered high quality ECEC with wrap around services to families with complex needs found significant learning and development benefits from 20.4 h per week of formal early years care and education, compared with a control group receiving 15.7 h per week (Tseng et al., 2019). This 'dose' of over 20 h is typically beyond the subsidised hours in childcare and available hours in preschools because many ECEC services structure their daily charges around a 9 (or 12) hour day regardless of how many hours the child attends (Bray et al., 2021). Furthermore, there is growing international evidence that high-quality ECEC from age 3 improves children's long-term outcomes and that many Australian children do not receive this amount of time (Beatson et al., 2022; Newman et al., 2022). Market mechanisms perpetuate disadvantage for families on lower incomes because parents have less capacity to find, access and pay for high quality care and education which suits their needs (Brogaard and Helby Petersen, 2022). The subsidised or free hours of ECEC provided to families are not sufficient to ensure children get the most out of ECEC. At a macro level, there are not only issues with the availability of high-quality services in disadvantaged areas, and with the system's potential to improve quality in these areas, but also with the hours of subsidised care available to families experiencing disadvantage.

Families experiencing disadvantage also have higher servicing needs than their better off counterparts. The current system requires service providers to be entrepreneurial and creative in accessing the resources needed to deliver effective services. These challenges are exacerbated in high poverty contexts because community needs are high across a range of domains and communities are often superdiverse and with high rates of forced housing mobility (Skattebol et al., 2016). Services that integrate children's education with family support services reduce the burden on families of using multiple services, are responsive to local conditions, and offer higher quality ECEC (Geinger et al., 2015), but these services are not available to all that need them. Furthermore, these services need to be able to retain staff over time, and those staff require specific skills for working with crisis situations.

Importantly, attitudinal studies of professionals across education, social work and child protection sectors suggest that 'poverty-blindness' is endemic (Simpson et al., 2017; Roets et al., 2020). In line with meritocratic logics, professionals assert they treat people 'the same' and address individual risk factors (Fenech and Skattebol, 2021). This approach often renders the systemic barriers families face invisible and places undue burden on families and individuals to meet their needs in a fragmented system. Educators require high levels of reflective and professional skill to navigate socio-emotional dynamics with families in times of crisis and who have experienced negative interactions in the past with professionals. So, whilst a variety of models for effective interdisciplinary work exist, they all require practice structures that support liaison across disciplines and professional communication skills in order to effectively meet the needs of families (Wong and Press, 2017). So for educators and allied professionals to be effective, they need to learn to accommodate a range

of disciplinary viewpoints and have good understanding of poverty, how it shapes everyday circumstances and gets under the skin.

Poverty: a multi-layered and diverse condition

Poverty is a multi-layered condition and manifests in highly varied ways in everyday life. Policy and practice responses need to respond to broad-brush effects as well as to situated understandings of the challenges in people's lives. Whilst poverty is broadly about inadequate resources, it is comprised of intersecting compounding conditions – insufficient income for basic needs, low quality precarious housing, unsafe and polluted neighbourhoods, and reduced access to high quality health and education services (Boyce et al., 2021). Broadly speaking, economic structures of Australian society reproduce disadvantage. Government benefits are well below the poverty line, whilst housing costs increase far more than rent subsidies (Duncan, 2022). People may rely on benefits, on precarious underpaid work in the cash economy, on top ups from family and welfare organisations or all three. Children and families face increasingly precarious labour markets and inequitable schools, so it is difficult to rise out of poverty.

In relation to upward economic mobility, Baldwin (1961/1992) famously observed that "anyone who has ever struggled with poverty knows how extremely expensive it is to be poor." This statement draws attention to the complex social processes that contribute to poverty. Goods and services are provided by operators who structure pricing in ways that benefit those with good cash flow and disadvantage those with limited expenditure ability. Payment plans without securities often attract higher overall costs. Families with no or poor rental track records often resort to renting properties above market prices. These added costs involve subtle interactions between human and non-human actors, histories and the disruptive force of events. Small cash or resourcing shortfalls can produce cascading shocks that lead to an array of complex problems – schooling change, breakdowns in familial or social networks, homelessness, and mental health struggles. A shock experienced in one domain or part of a social network can produce a shudder in another (Hancock et al., 2018). We know, for example, when some families cannot afford to feed children, they keep them out of school to avoid the stigma of going without (Skattebol et al., 2012). Furthermore, economic geographies determine what is available to be used and to be bought. As families slip into severe poverty, they cluster in places where it is cheapest to live.

Over 20% of Australia's young people in disadvantaged households live in areas of concentrated disadvantage. Importantly for policy and service provision, 80% are living in mixed SES areas (Abello et al., 2016). Nevertheless, a focus on areas of concentrated disadvantage is critical because these areas rarely improve over time (Duncan, 2022). They are typically in regional or remote areas or regions on urban peripheries with significant public housing and low-quality housing stock and far from vibrant labour markets. As online platforms become more ubiquitous as a starting point for receiving most government and non-government services, the challenges of everyday life are compounded by inadequate digital infrastructure. Poor connectivity is a feature of low-income areas on the periphery of large cities, regional and remote areas (Seymour et al., 2020). Overcrowded houses and unsafe local parks further ramp up the pressures on families with children (Goldfeld et al., 2021).

Australian policy claims that all children – regardless of background or circumstances – have equal educational opportunities. Public resources are distributed universally, some children/areas receive targeted 'top-ups' and the underlying policy logic is that with hard work and merit anyone can secure upward mobility. This logic is widely accepted by all economic classes across all developed countries (Mijs and Savage, 2020) and it supresses attention to deep system structures which reproduce inequalities and asserts a 'cruel optimism' that anyone can achieve social mobility. Conditionality in welfare (social security) policies suggest that recipients of social benefits are locked into cultures of dependence (Klein et al., 2022). When children face multidimensional disadvantages, parental/caregiver capacities are questioned (Edwards et al., 2015). In short, our safety nets are structured in a way that supports prevailing beliefs that people in poverty lack the grit for upward mobility.

It is important that policy makers and practitioners respond effectively to the debilitating effects of stigma that is associated with poverty. Stigma undermines human dignity and operates as a felt disgrace. Stigma is widely experienced, highly debilitating and associated with toxic stress which can undermine the building blocks of health development (Shonkoff et al., 2021). When a person presents as visibly 'poor', they are vulnerable to micro-interactions with others which leave them feeling they have been disgraced. These feelings can flare up in supermarket and pharmacy queues, at school gates, in classrooms, watching television, and in the mirror. Stigma can be public, institutionalised, or internalised (Friedman et al., 2022). People in poverty buffer themselves and those they love from stigma. Children as well as adults may minimise resource shortages, adapt preferences, isolate from better-off counterparts or from services, and build community with others who are similarly marginalised (Redmond et al., 2016; Peterie et al., 2019). Furthermore, families struggling with poverty often have attenuated or closed social networks that can result in limited knowledge about service supports that are available (Mitchell and Meagher-Lundberg, 2017). Children in families experiencing poverty are often protected from the most detrimental effects by their family, who may go without or downplay difficult experiences. They are likely to have different needs, assets and experiences to other children (Hedegaard and Fleer, 2013; Leseman and Slot, 2014; Redmond et al., 2016).

Finally, there is enormous diversity in localised conditions of poverty and how people live in those conditions. Some people live in large, tightly connected family groups and others are in deep isolation, some people are living amongst their better-off counterparts, and some are in areas of concentrated disadvantage. Some have highly developed money management skills and others do not. Some people have intergenerational histories of institutional failures in Australia and others are new arrivals. Ameliorating the effects of poverty in young children's lives thus requires broad understandings of the conditions of poverty as well as situated knowledge that is developed from the ground up with the people that experience it.

Participation in high quality ECEC programs

The barriers to participation are well rehearsed in the literature. Structural factors such as affordability and accessibility (available places) continue to headline as barriers to participation in ECEC (The

Smith Family, 2020). Low-income parents have fewer financial resources to purchase care, places where they live are often unavailable, and many have little information about costs and subsidies. They may lack transport, be time poor, experience disability and high housing mobility (Wood et al., 2020; Beatson et al., 2022). Effective services respond to this challenge by making themselves easily **approachable** through outreach initiatives and/or brokerage organisations (Mitchell and Meagher-Lundberg, 2017). Outreach and other brokerage activities intentionally place key service information in places where families go–near supermarkets, health services and local parks (Fenech and Skattebol, 2021).

Cultural safety has been identified in the literature as a significant barrier to the take up of ECEC services. Value dissonances in child rearing, dietary or disciplinary practices can tap into a lack of trust families have in institutions and leave families feeling culturally unsafe (Gilley et al., 2015; Fenech and Skattebol, 2021). However, when families feel culturally safe, they can entrust their children to staff in services. Services are **acceptable** to families when early interactions are compatible with family communication styles, protocols, and values. Cultural 'brokerage' is widely accepted as an important practice for engaging Aboriginal and Torres Strait Islander families (Barratt-Pugh et al., 2021). The importance of learning from and engaging cultural insiders also applies to other disenfranchised groups including refugees (Mitchell and Meagher-Lundberg, 2017). However, cultural knowledge must be locally specific and developed through respectful relationships with local community members. Local knowledge and diversity training can support educators to attend to micro-interactions, learn about specific family practices, and understand community alliances. Here, situated knowledge of poverty (Skattebol et al., 2016) and how it plays out in people's lives, is critical.

Another barrier identified in the literature concerns the **availability** of places. Areas of disadvantage and areas that are further from urban hubs are often 'under-supplied'. A 2022 report that mapped childcare provision to demographics across Australia found that 568,700 children aged 0–4 years, or 36.5%, live in neighbourhoods classified as 'childcare deserts' defined as such because there are over three children per childcare place (Hurley et al., 2022). Similar trends have been observed in studies of attendance rates (Pascoe and Brennan, 2018). For families struggling with basic resourcing, the idea of 'availability' needs to be considered over a range of timeframes – daily, weekly and over the stages of a year. Flexible session times support Aboriginal and Torres Strait Islander families who need to return home to country to sustain family and spiritual connections and are critical for families who are mobile for periods because of family violence (Barratt-Pugh et al., 2021).We know that surplus capacity is financially challenging for services viability (Bray et al., 2021, p302), but when a service is run at full capacity they often cannot accommodate families whose days and hours of employment change (Cortis et al., 2021). In terms of competent ECEC systems that can accommodate family needs for flexible hours, governments would need to systematically monitor childcare availability and develop targeted solutions that involves funded spaces to be held available for families with complex needs (Wood et al., 2020).

Affordability is a key barrier for many families. Attendance in ECEC services decreases the lower the family income and the higher the level of financial stress. Only 18.2% of families with an income of <$600 per week income were using formal childcare compared to 33.8% of families whose income exceeds $1,000 per week [Australian Bureau of

Statistics (ABS), 2018] Furthermore, the capacity to pay is not fixed and many families have changing income and financial circumstances. These families also face significant administrative burdens in constantly updating income statements to access subsidies.

Lastly, sustained attendance in ECEC requires that services are **appropriate** and useful for families and help them meet the goals they have for their children – such as learning for school readiness or learning that helps children establish cultural group membership. Literature on pedagogical approaches to children experiencing poverty is scarce. We do know that educators do not always seek to understand the knowledge children bring to ECEC settings. Simpson et al. (2017) noted that practitioners working in high poverty contexts lack poverty sensitivity and deliver standardised rather than responsive practices. Similarly, in Australia studies have found that educators are most likely to consider family cultures and knowledge without finding out how the socio-economic conditions of everyday life intersects with culture and knowledge (Nolan, 2021).

Learning experiences are most effective when they are tailored to knowledge that children have gained through daily experiences so they can engage in sustained shared thinking with educators and peers (González et al., 2006; Hedegaard and Fleer, 2013; Taggart et al., 2015; Siraj et al., 2019). This knowledge has been termed children's funds of knowledge (González et al., 2006). In this approach to pedagogy, educators seek to identify the knowledge of the family, informed through culture and history as well as the practices of teaching and learning in the child's home. Children are most competent in the knowledge and practices they are most familiar with, so this foundation is used in teaching to ensure developmental gains are made through the zone where established and new knowledge interact.

A small body of research indicates that it can be challenging for teachers and practitioners to access the funds of knowledge of people who have been stigmatised and excluded. Families may doubt their own knowledge due to past experiences of deficits being attributed to them as individuals or to their family situation and may value their privacy (Llopart and Esteban-Guitart, 2017). There are examples of effective practice from practitioners and teachers who are trained in theories of cultural capital, Critical Race Theory, culturally relevant pedagogies, anti-deficit theory and strategies for critical reflection. Although much of this research is focussed on school aged children (Lampert and Burnett, 2016) there are some good ECEC examples (see Hedges et al., 2011; Arndt and Tesar, 2014). One of the most valuable contributions of the funds of knowledge approach is that it challenges the idea that poor families have less knowledge, poorer organisational skills and less capacity to learn than other people. It leverages the knowledge in families in the learning experiences to improve children's learning outcomes.

A framework for the 5 aspects of engagement

We position the above enablers of participation in quality ECEC in an ecological framework – originally designed to assess the health service characteristics that support the people who find health services hard to use (Levesque et al., 2013). It was adapted for assessment of ECEC services (Archambault et al., 2020). The benefit of the model is that moves away from deficit understandings of families who find services hard to use and focuses instead on the material, social and internal resources that families have and how service structures and practices interact with these resources. We have adapted the model further (Figure 1) to place family resources as the starting point. We labelled the continuum of service characteristics using alliteration (approachability, acceptability, accessibility, affordability, and appropriateness) to make it easy to remember. This model maps well to our findings as well as to the literature.

In the 5 Aspects of Engagement framework, we have conceptualised the aspects as *what families need to see and experience from services so they can engage with them.* On the left, at the most minimum level – approachability – families need to know of a service and connect before any engagement can happen. On the right, at the deepest level of engagement – appropriateness, services meet all the needs of children and their families. The sequencing of the aspects follows the steps a family in deep isolation goes through as they take their child to preschool. The different aspects may be more or less important as the family's connectedness to the system develops. Furthermore, the aspect of acceptability may be vitally important at every step for some families yet recede in urgency for others. The framework emphasises the importance of the complementarity of interventions between different partners working towards the common goal of equitable access to services.

This model does not address all the elements required to make a competent early childhood and care system in the definition coined by Urban et al. (2012). Questions about workforce attraction and retention, leadership and governance are outside the scope of this paper and of the model. The model is concerned with what families might need to see and experience from educators and the processes and structures in services to they are easy to use.

Methodology

This paper draws on data from research that aimed to identify the characteristics of services that effectively address the needs of families experiencing adversities and disadvantage. We conducted a review of international literature (including the 'grey' literature) and interviewed high level stakeholders (policy makers and large organisations) using a Delphi methodology. A Delphi method approach was used to elicit the perspectives of policy makers and service providers known for their interest in service delivery to families experiencing disadvantages. The Delphi technique (Diamond et al., 2014) is a two-step iterative communication process aimed at conducting detailed examinations and discussions of a specific issue, in this case, equitable access to high quality ECEC. The method allows participants to think independently and researchers to build consensus, identify outlier opinions and neutralise the power relations between experts. It supports co-thinking of complex problems and enables participants to scrutinise each other's responses and revise or refine their thinking. It allowed us to address the potential halo effect of key ECEC policy architectures – the National Quality Standard and Early Years Learning Framework which have been collaboratively developed in the sector over a long period of negotiation with all sector stakeholders and government (Sumsion et al., 2009). The halo effect occurs when high profile experts, or in the ECEC case, when groups of high-profile experts have designed something together and others are wary of expressing dissenting opinions. Our interest was to investigate if these guiding practice architectures are effective enough to support high quality

Framework: Five Aspects of Effective Engagement in Early Education and Care
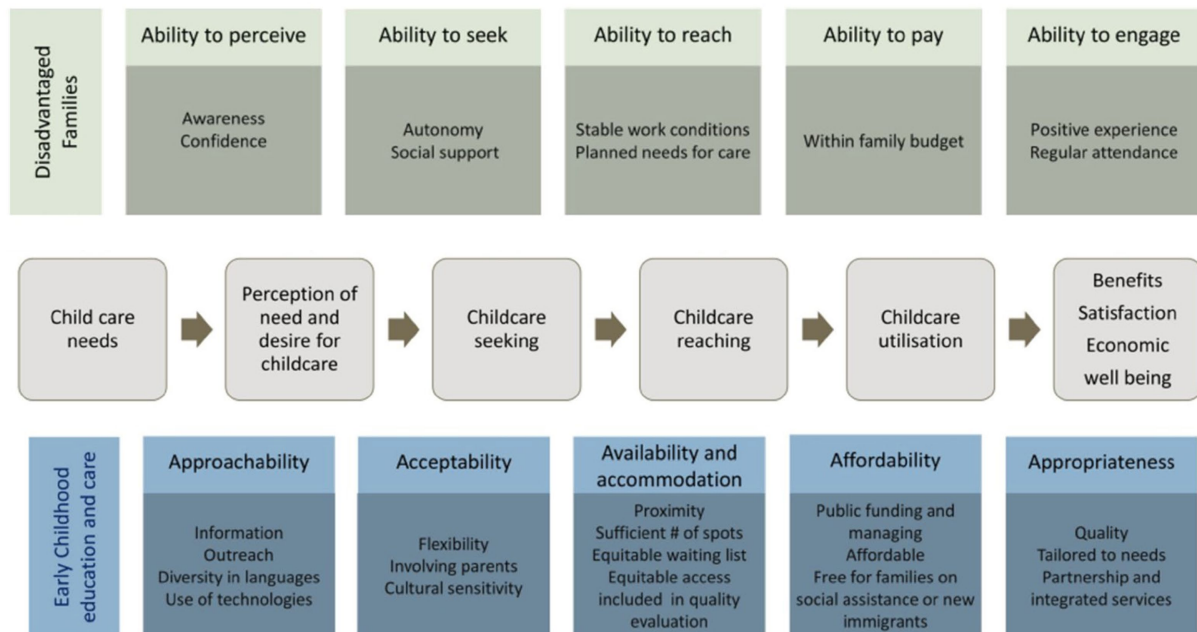
Source: Skattebol, J., Blaxland, M., & Adamson, E. (2021). *The Five Aspects of Effective Engagement in Early Childhood Education: Approachability, Acceptability, Availability, Affordability, Appropriateness*. Sydney: UNSW Social Policy Research Centre. http://doi.org/10.26190/5fa0c6861b8af

FIGURE 1
A conceptual framework of access to quality ECECs for children from disadvantaged backgrounds.

practice in disadvantaged contexts. The project aimed to understand whether there are aspects of effective practice that sit outside existing quality practice architectures, such as the Early Years Learning Framework and National Quality Standard.

We established an advisory group from key advocacy organisations to help identify participants with expertise on services in high poverty contexts and to shape findings. The selection criteria were that the participants were at senior executive level in an organisation with a track record of including children who typically miss out on ECEC. We did not include participants in stand-alone services. Our participants were in not-for-profit[2] provider organisations (both large and medium size; $n = 9$), in senior government policy positions ($n = 3$), training organisations specialising in services in high poverty contexts ($n = 3$), allied services – in partnership ($n = 2$), philanthropic brokerage organisations ($n = 3$), Indigenous specific services ($n = 2$), a university/government partnership aimed at improving pre-school attendance ($n = 1$). We conducted 23 semi-structured telephone interviews with participants. A review of the literature informed the first round of questions which included identifying the characteristics of families who find services hard to use, utility of subsidy processes, provider costs, strategies for access, strategies for

settling families into services, pedagogical practices, quality standards and monitoring, challenges specific to regional, remote, and Indigenous communities, and reflections on the ideal ECEC system. The research team then conducted an iterative thematic analysis (Neale, 2016) of the interviews, beginning with codes based on a review of the literature. Participants were then sent a summary report that noted points of consensus and dissensus and were invited to further reflect on the scope and geographical reach of brokerage available, the outreach, access and flexibility approaches summarised, costs of inclusion and how these can be financed, examples of pedagogical excellence, and the comprehensiveness of existing quality frameworks. The second round of data collection encouraged the expression of opinions, critique, and revisions of judgement by enabling participants to comment on the positions of anonymous others in a cyclic data refinement process. Subsequent data was then subject to higher order coding and the 5 Aspects framework was developed.

Findings

This section presents the strategies and practices that stakeholders had seen ease the engagement process for families who find services hard to use. They identified families with the following characteristics as more likely to find services hard to use – low-income families (in particular, those facing intergenerational disadvantage with negative experiences of institutional failures), families with contact with the child protection system, children and families experiencing trauma,

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2 For-profit providers were included in the potential sample, however none were nominated who met the selection criteria of having a strong record of inclusion.

families with mental health issues, as well as Aboriginal and Torres Strait Islander families, asylum seekers and refugees. The findings are presented below and organised through the 5 Aspects of Engagement framework.

Approachability

Participants discussed outreach and brokerage as essential activities aimed at bringing ECEC services to families who are isolated or excluded. The outreach/brokerage continuum moved from connecting directly with families to enabling families to connect with other organisations. Stakeholders emphasised the need for resources that build family's knowledge of what is available in the early years system, opportunities to build relationships with services before committing to enrollment, practical help with administration and paying childcare debts. Most highlighted the need for professional networking so educators could build trusting relationships with other professionals who may have the trust of families in deep isolation.

Overall, there was a high level of consensus on strategies for outreach. Examples of access and outreach principles and practices included:

- Soft entry points – playgroups, BBQs and other community events.
- Opportunities for families to observe what happened in services without being formally enrolled.
- Information sharing about the Australian ECEC system to families.
- Practical supports such as coordinating transport.
- Connecting with other support services, such as disability services, health providers, child protection.
- Peer to peer engagement/activities.
- Strong service networks and interagency collaboration.

Many organisations offered light touch community events throughout the year.

> We offer a community hall where there might be a day for young parents to come in and just connect with others. It could be focused around reading. Generally, they are fairly broad sorts of occasions to connect community, resident to resident, not-for-profit to not-for-profit. We work with probably a dozen different community groups like this and run a variety of these types of things.

Some participants noted that organisations need to continually reflect on who lives locally but are not using services and why.

> "Who is not here?" is important for thinking about who is not accessing ECEC services and what could be done differently to support their engagement. A local organisation, agency or professional is likely to know these families and children but an ECEC service might not have any idea or the capacity to identify them.

Effective outreach was offered by a range of service types – integrated child and family services, standalone long day care or kindergarten services. Typically, brokerage initiatives found places for

families and created conditions which enabled families to use services. Those that offered financial help to support with debts were funded through philanthropic organisations. They were often embedded in place-based initiatives where there were concentrations of families who do not use ECEC. Importantly for policy, most respondents saw that outreach initiatives were highly successful but that the distribution of outreach activities was 'ad hoc' across the sector and missed many families in need.

Acceptability

The challenge of delivering acceptable culturally safe services to families starts at the first point of contact and continues throughout the family's connection to the service. Participants noted that cultural safety for families was essential but required support and training to establish. They described acceptability as a feeling that needed to be generated rather than a set of prescribed cultural practices.

> I think if it's really high quality, you can walk into a service and right from step one, you'd be able to feel that the service really wants to work with me and my child. And even that might take a long time, but you can feel it every step of the way.

Our informants agreed that strong relationships with families involved reflecting and valuing cultural difference. Cross-cultural competence based in reflexivity was considered foundational to effective practice.

> staff need to be able to acknowledge and be really aware of their own biases, and the way they may interact with a family, based on their bias and they need to be able to put that to one side.

Learning about how children are reared in different cultures was essential. One informant described the need for service providers to be 'researchers of their own community', so they could meet family needs for safety. Another noted:

> You definitely have to have a good knowledge of their culture, and what are cultural norms for them, and how is that reflected in your services; are they the same thing?

> Like, we encourage children to take their shoes off, and run around and play, and get muddy and dirty; but that's not cultural norm for some of our families. When the family comes to pick them up, and they don't have their shoes on, or they're missing a sock, that's a really big thing for them. We've got to think, "Okay, well, what is their cultural norm? What are we doing? Are they reflective of that?"

Staffing that reflected diverse cultural groups in the community was seen as a good starting point for delivering services that are acceptable to families. One participant explained this as follows: "*they can see themselves in there…that their type of family is okay [there].*" Staff who shared a cultural background with families could potentially provide insights into the parents' views and knowledge about their children's development. Where educators and families shared a first language other than English, staff could provide translation and

interpreter support, and sometimes socio-political histories which supported educators to have better situated understandings of families and what was important to them. Significantly, these activities were often conducted by staff in unpaid time.

Guidance from cultural insiders was considered critical in establishing cultural safety for Aboriginal and Torres Strait Islander families but most participants felt there were different ways of accessing cultural support to ensure their service was culturally safe and responsive. Some participants emphasised the importance of designated positions in their own organisation.

> We do have at least around about four Aboriginal staff members, and we have a community liaison officer, an Aboriginal community liaison officer, who helps us support our families, our Indigenous families, with enrolments, and doing home visits, following them up and things like that.

Other participants felt that 'cultural brokers' from within Aboriginal and Torres Strait Islander and migrant communities can be, but do not necessarily need to be, directly employed at the setting. They recognised the importance of responding to the needs of families rather than having a single approach to inclusion. One service provider stated:

> We work really closely with an Aboriginal corporation. They partner with us, and we employ an Aboriginal worker. People need choice. So Aboriginal people don't necessarily want to work with an Aboriginal organisation, but they want to have the choice to, or not, and still be able to get safe services.

In addition to employing and building relationships with representatives from the local community, services attempted to design their physical spaces so they could interact with families in ways that were acceptable to them. Interactions needed to be handled with great respect for people's privacy. Many families did not want others in the community to know their business, so first point of contact services needed to offer discreet places where conversations with families could take place.

The issue of providing safe environments for families who had experienced trauma was raised by all informants. Various trauma and attachment-based approaches that worked with families and children with complex trauma were cited. This work is highly specialised and we cannot do it justice in the scope of this paper. The important finding from these stories is that teams need adequate training and support to address trauma.

Importantly, the need for specialised training extended beyond trauma practices. Participants identified a need to develop skills amongst ECEC staff and educators to build effective and trusted relationships. For this, there is a need for professional learning for existing staff and new graduates about the conditions of poverty broadly and about its many manifestations.

Accessibility

Informants noted that families experiencing poverty often required help navigating government systems and websites, gathering required documentation, finding an available place, completing enrolment forms and practical supports – like transport, printing forms, getting birth certificates and immunizations up to date. We heard examples of providers working to establish this trust directly, and also examples where brokerage agencies established this trust and then made 'warm referrals' so that families could easily access services they would find useful. Warm referrals are when service providers select specific services for families and follow through until connections are made (Goldberg et al., 2018). One informant from a small service offering wrap around support observed that warm sustained brokerage was needed with families in deep isolation:

> This is easier said than done. You need someone to scaffold the family to move to a service, and almost hold their hands for a while. We quite often had the scenario of a vulnerable family coming to a supported playgroup, where they got to know other people. The playgroup facilitator scaffolded them in that situation, and then they would enroll their child at childcare. The transition could be fine, but other times, maybe it wasn't. If they didn't feel as comfortable doing that, we would actually have that worker scaffold the family a bit.

Brokerage organisations supported ECEC services to be accessible as well as supported families to gain access. If small stand-alone providers were not able to provide the support families required brokerage agencies stepped in. One brokerage agency said:

> We've made it really clear with all the [local] centers we support that if you have families who you think are going to walk away, and you need extra help to make it work for them, give us a call and we'll see how we can all come up with something together. And that might just be that the centers don't have the time to sit there, or to go through all the things online with them or apply for birth certificates.

Affordability

As noted above, many families are not familiar with the ECEC fee and subsidy system. Our informants noted that a significant number of families they worked with were not aware that subsidies were available. In addition, some families did not have the required documentation to apply for fee subsidies (called the Child Care Subsidy) so the process could be challenging and time consuming. The director of a long day care service said:

> I will say 50% or more [of newly enrolling families] are not familiar with the Child Care Subsidy. They need advice on how to go about it, what to do, what they need. If we ask, have you enquired about your Child Care Subsidy, some would say, what's that? So, you have to tell them where to go, what to ask for and how that would influence their enrolment.

Stakeholders also talked about delays in the processing times for families' fee subsidy applications. Some organisations responded by offering families various kinds of fee relief – reducing or waiving enrolment bonds, or not charging families extra if children stayed overtime. As noted earlier, some brokerage organisations paid childcare debts so families could re-engage with childcare services.

Appropriateness

The appropriateness of a service is determined by how well a service can meet a family's needs over time. Organisations sequenced their orientation and engagement processes in different ways. Some used very light and unstructured processes, whilst others conducted meetings focused on goal setting for children with detail and clarity about how goals would be met.

At the informal end of the spectrum of orientation processes, few demands for information were placed on families. One participant described the need to set up the physical entrances to the service in ways that encouraged families to come with their children and observe without having to speak or engage with workers. They suggested that some families want to get the look and feel for a service before they are given information about the processes and requirements. This service set up a welcoming seating area near the street where families could stop, rest, and allow their children to wander in. Families were enabled to return and remain in this observing space as many times as they wanted. In a similar vein, one provider noted they needed to look at their processes from the point of view of families:

> Many of our families have not had any positive experience with any kind of authority, any kind of formal processing. Families who have had difficult immigration processes, fled from a country, come to the country through the 'not straight' pathway, even some who have come through the legal straight pathway. It wasn't until we actually started to reflect on why we were struggling to get a full enrolment process completed and then when we could see we're throwing all of these documents at families who have just had a life full of documents."

At the more formal and structured end of the spectrum of orientation processes, families were scaffolded through every element of the service induction via carefully structured relationship building.

> So orientation tours- we sit down with the families, talk to them about their needs. It's sort of like a chat, where we build relationships [and find out] what they want the children to have or experience while they're here, and what experience previously they've had. Then we go around, showing them the premises. We talk about what we teach the children, what the children might learn or do while they're here, what services we provide – like meals, nappy changing, all the records and charts that are available to them, or how we document and how we get the parents' input, and what they want the children to learn, too.

Highly structured and thorough orientation process were understood by these stakeholders as central to strong relationship building. Whilst there were different strategies implemented, our informants concurred there needed to be multiple opportunities for families to share concerns and that attachment-based structures were a critical support for educator/family relationships. This typically involved a primary caregiver system where each family is assigned a key worker for their daily communications, with service directors and/ or other personnel following up with the families regularly.

Whilst there were differences in approaches to orientation, there was consensus that many families could only stay connected with services when those services were flexible.

> Sometimes family circumstances change in an absolute heartbeat. The standard procedure is that if the child is going to cease care with us, we ask for a four-week notice period. But we absolutely need to be flexible if we've got a family, which we've had a number, who need to go to protective custody, you know, you can't just say, "Oh, but hang on. We need four weeks' notice" There are times where you just need to go, "Okay. You need to leave the state. If you can give us a call in a couple of weeks to let us know, we'd love to hear from you"

The need for flexible enrollment and attendance was emphasised for Aboriginal and Torres Strait Islander families.

> They have often have cultural obligations to respond to the needs of family members, attend funerals and other sorry business, to go back to country for important cultural events, social and spiritual rejuvenation.

The structures of mainstream services and subsidy systems often make it difficult to meet these obligations which are central to the wellbeing of communities and individuals.

When asked about pedagogy there was a high level of consensus in the interviews about the need for quality learning in high poverty contexts. Informants talked about partnerships between families and educators that supported children's learning. However, there was little discussion about how this could be operationalised in pedagogical practice and few examples were given. Similarly, the Australian Early Years Learning Framework was cited by participants as an effective approach to pedagogy but there was very little elaboration about how experiences of poverty shape children's existing knowledges and how to work with this.

One informant elaborated on the types of pedagogical support she had witnessed working in professional development in services in high poverty contexts. She noted educators typically held low expectations of children's learning. Importantly, she observed that educators tended to have an exclusive focus on children's needs in social–emotional and life skill areas rather than on what they already know:

> I've found that educators already have a belief that children will not achieve because of what the educator sees as the family circumstances in which the children are experiencing their lives. So, they won't say these kids have got no hope. It won't be like that, but it will be, "Oh, we have to take account of the fact that we have to spend a lot of time on routines with these children."

She proposed that culturally responsive pedagogies required educators to become researchers of their local communities because children learn through playing with familiar things – re-enacting behaviour that they see in the community using pretend and imagination.

> This understanding of how children learn underpins what we regularly see in early childhood settings and kinder classrooms where children are offered a play corner where they re-enact going to a restaurant with menus and tablecloths and so on. However, if this experience is unfamiliar to children, it has no meaning. In high poverty contexts, educators need to research the familiar experiences children have like going to the doctor and or a clinic – seeing how oral transactions take place and having a chance to re-enact this experience.

Overall, the interviews suggest that pedagogical approaches are heavily focused on social emotional skills and that dialogic strength-based educator/family partnerships are a key domain of underdeveloped expertise in the sector.

Conclusion

These findings from interviews with 23 high level stakeholders identify the way that micro, meso and macro levels interact in a way that both creates, yet also work to overcome, barriers to engaging with high quality ECEC for children experiencing poverty. A high-quality equitable system requires more than subsidies and available places. It requires multi-level understandings of the effects of living in poverty, policy and practice architectures that address all the barriers families face.

Our study found that we need better understandings of the practices that galvanise the assets in these families and to rethink the training for educators who work with complex issues. Whilst a recent systematic review showed that the qualification levels of educators are paramount for delivering high quality ECEC (Manning et al., 2019), the findings here suggest that practitioners working in high poverty settings must possess knowledge and skills beyond that which is typically credentialled (for elaboration on this argument see Jackson, 2022). Educators go to enormous lengths to mobilise to support in their own and other organisations so that low-income families can engage with ECEC services. These practitioners on the ground are integral to driving these meso-level changes in their organisations, and often play important roles in advocacy to the meso- and macro-level.

Our findings emphasise the importance of outreach and brokerage models that make services approachable, as well as the range of innovative practices and strategies that staff utilise to provide acceptable, accessible, and appropriate services. It is evident that many of these practices are costly and made possible by cross-subsidisation in large organisations, buckets of philanthropic funding and unpaid staff time. These practices are not well accounted for in service budgets or in inclusion funding. This gap in knowledge about what it costs to deliver these services is a critical barrier to the development of inclusive ECEC policy.

Whilst stakeholders recognised the benefits of the National Quality Standard, they also believed that quality in services needed to calibrate to the needs of the local context and much unfunded essential work needs to be acknowledged in quality frameworks. The stakeholders we spoke with all operated within areas of concentrated enduring disadvantage. Investment in ECEC for low-income children and families is largely targeted in low-socioeconomic locations, where there is a concentration of

complex needs. Services in these areas tend to be well-rehearsed and networked with other social services. It is also important, however, to consider how providers in mixed socioeconomic areas reach children experiencing poverty (~80% of people in poverty live in mixed SES areas). The service systems in mixed socio-economic areas differ from high poverty contexts and are likely to have far fewer outreach and brokerage programs and/or access to free or low-cost community and social services. Families and children in these areas are often 'hidden' and harder to reach if they are not already connected to services. There is not strong evidence about what is needed in these areas.

The knowledge shared by stakeholders provides valuable evidence for providers. However, government investment and strategic planning is required at the systems, or macro-, level to realise these high-quality practices for all children experiencing poverty in socioeconomically diverse and complex geographic locations. Current government policy prioritises investment in fee subsidies for families to improve the affordability of services, yet more investment is required to enable the system to implement effective outreach that reflects the local context and cultural values of families and communities. Consistent with literature that overviews the ECEC system (Bray et al., 2021), stakeholders reiterated that the subsidy system is too complex and creates administrative barriers to children and families trying to access ECEC services. System-wide changes to skills and qualifications required would support educators to enhance their skills in culturally relevant pedagogies and improve the capacity of staff to mobilise the strengths of children and families who experience adversities. Furthermore, there are significant workforce, leadership and governance challenges documented elsewhere that governments need to address (see for example commentary such as "As ECEC battles ongoing workforce crisis, managers need to focus on culture https://thesector.com.au/2023/01/18/as-ecec-battles-ongoing-workforce-crisis-managers-need-to-focus-on-culture/").

We have seen the governments respond to the sector needs and deliver supply side supports through the Covid pandemic (Plibersek, 2020). These temporary changes at the macro level arguably relieved some of the stresses and barriers previously – and since – experienced by children living in low-income families. Governments have the capacity to make changes, but the early childhood education and care sector still requires more investment for children in disadvantaged contexts to accrue the benefits of high-quality education and care.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by UNSW Human Research Ethics Committee. The patients/participants provided their written informed consent to participate in this study.

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Conceptualising the education and care workforce from the perspective of children and young people

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Children are significant stakeholders within education and care settings. Their views can be invaluable in thinking about what matters to conceptualising, assessing and improving quality in Early Childhood Education and Care (ECEC) and Outside School Hours Care (OSHC) settings. As stakeholders, children's views are rarely listened to by Australian policy makers to assess what constitutes quality and how the quality can be improved. In the process of updating two nationally approved Australian Learning Frameworks (ALFs): *Belonging, Being and Becoming*: *The Early Years Learning Framework for Australia* 2.0 and *My Time Our Place: Framework for School Age Care in Australia 2.0*, children's responses provided meaningful insights into their perceptions of the practices of the educators. The children's perspectives were gathered in a combination of research methodologies of talking circles, dialogic drawing, and visual elicitation. Their responses about experiences in Early Childhood Education and Care (ECEC) and Outside School Hours Care (OSHC) contexts were analysed to provide a deeper understanding about the characteristics of their experiences in the settings. The research process delivered information about children's perspectives about pedagogical principles and practices that describe the Australian children's education and care workforce and environments. The process of gathering the children's perspectives is not without limitations, however the information is invaluable in considering the assessment and improvement of quality in children's services.

KEYWORDS

children, children's voices, education and care, workforce, relationships

1. Introduction

The Australian children's education and care workforce develops and implements programs for children based on two national curriculum guidelines [known as the Approved Learning Frameworks (ALFs)] –*Belonging, Being and Becoming*: *The Early Years Learning Framework for Australia 2.0* and *My Time Our Place: Framework for School Age Care in Australia 2.0*. These Frameworks guide practice in kindergartens/preschools, long day care centres, family day care and outside school hours care (OSHC). The Frameworks are part of the National Quality

Framework (NQF) (2021) and contain explicit examples of the ways in which educators use pedagogical practices to engage children to achieve quality outcomes for learning, development and wellbeing. These Frameworks were updated in 2023 by a collaboration of six researchers who worked closely with a consortium of professionals and academics. The writing of the first versions of the ALFs did not have any contributions by children. As part of this research project the researchers examined research tools that would invite children to give their perspectives about the principles and pedagogical practices of the workforce that facilitated the programs of care and education in ECEC and OSHC settings. In so doing children were recognized as key stakeholders in the project and contributed to the updating of these pivotal policy documents that are part of the quality assurance process in children's services.

The research project was intended to examine the relevance of the frameworks and update the content to be relevant to the field. This article describes the process of facilitating the inclusion of children's voices as part of this larger research project to review and refresh the ALFs. In particular, the research question about the principles and practices of the workforce that contribute to quality education and care settings. In the project, engagement with children made visible diverse perspectives characterizing their experiences in ECEC and OSHC particularly as it pertained to the quality and characteristics of their experiences and interactions with the children's services workforce. This included the descriptions of pedagogy, principles and practices that inform workforce roles and responsibilities. Children's rights to have a say about their experiences were upheld. The children made unique insights about criteria to use when assessing the quality and characteristics of the workforce.

The introduction to the paper sets the context for discussing the quality of the workforce characteristics in Australian education and care services. It introduces the significance of research processes that include children. It highlights how the research design to update the Frameworks from the outset honored the voices of children in the choice of methodologies. Also, the paper includes insights children proposed about the characteristics of the workforce and environment they expected in the education and care settings they attend. The conclusion of the paper advocates for the use of methodologies that could be adopted more broadly in children's services settings to provide rich insights when assessing both children perspectives of their learning, development and wellbeing in conjunction with assessing the quality of settings.

2. Education and care sector in Australia

The Australian education and care sector comprises a diverse mix of settings catering for children prior to compulsory school entry such as kindergartens and long day care, schools and before and after school care services for older children. The current service system, a term used loosely here, is the outcome of an historically piecemeal approach to policy, funding and administration in education and care (Irvine and Farrell, 2013). Now seen as a quasi-market (Carey et al., 2020), the sector comprises around 16,500 services which are delivered by a range of providers, most often characterized as private for profit (50%), private not for profit (community managed and other organizations, 34%), government managed (State and Local, 7%) and

school based (State, Independent and Catholic, 8%; ACECQA, 2021, p. 8). Regardless of service type or provider, the vast majority of ECEC and OSHC services operate under a National Quality Framework (NQF), the exception being some preschool education programs in the year before compulsory school that sit within the school system. The NQF includes legislation and regulations, a National Quality Standard and two nationally ALFs. Designed to drive continuous quality improvement and enhanced educational and developmental outcomes for children, the NQF is founded on a set of guiding principles including recognition of children as capable and agentic learners and their right to participate in decisions that affect them (ACECQA, 2021).

Realization of the intent of the NQF is dependent upon Australia attracting, supporting and sustaining a skilled, engaged and professional workforce (McDonald et al., 2018). The current workforce is estimated to comprise around 200,000 teachers and educators; the majority holding vocational qualifications (Education Services Australia, 2021). However, demand continues to outweigh supply, with predictions of growing workforce shortages attributed to a range of persistent challenges, most notably the lack of recognition of the professional nature of this work and associated remuneration (Irvine et al., 2016; Education Services Australia, 2021). Increasing, government and community expectations and work intensification have also been recognized as impacting attraction and retention (ACECQA, 2021). Despite the number of children and families using ECEC and OSHC settings there appears to be a paucity of research about the determinants for assessing high quality services (Vermeer et al., 2016). A small but growing number of Australian studies (McDonald et al., 2018; Harrison et al., 2019) highlight key factors contributing to engagement and retention of educators including their sense of purpose, enjoyment working with children, and knowing they are making a positive difference. However, in these studies children's contribution to assessing the quality of the services in which they are stakeholders are not featured.

3. Children's right to have a say about their education and care

The Children's Rights agenda draws on The Convention on the Rights of Children (UN, 1989) and states that children should have a say on matters that affect them (Article 12). It has cultivated child research by nurturing a realization that children have a right to be consulted (Smith 2013; Lundy et al., 2015), heard, and to appropriately influence the facilities and services that are provided for them (Quennerstedt, 2014; Nolas, 2015; Farina and Scollan, 2019). Adopting such a "rights-based" framework actively positions children's contribution as an inclusive approach to connecting "children's rights, research methods and research ethics" (Mayne and Howitt, 2015, p. 37). If children are going to be heard and influence policies and services provided for them, real and tangible acceptance of their rights is necessary to amplify their voices and allow change to occur.

The relationships between adult/ researcher and child can influence the opportunities for them to 'have a say'. Child-adult relationships are situated within a negotiated framework of process and representation. Consideration needs to be given to adults' positioning, to enable children to participate. Nicholson et al. (2015) highlight the importance of situating child-adult narratives alongside

each other to provide a more holistic view of children's experiences. Understanding their perspectives about research methods used makes visible their motivations to engage (Lundy, 2018, 2019). In research with children, it is not enough to gather what they want to say, as the context in which they were invited to participate should also be noted.

Contemporary perspectives of children and childhood frames them as active global citizens. Theories of childhood focus on children as strong, capable and rich (Corsaro, 2014; James and Prout, 2015; Warming, 2019). Within the theoretical framework of the sociology of childhood, it is assumed children are capable of expressing their views and perspectives which are different to adults. Valuing children's perspectives as different to adults, acknowledges children's unique, distinctive and important contribution. Furthermore, recognizing children as capable and competent contributors in research through a shared ownership of the process enables a co-construction of meaning and richer data.

Children have often been excluded from participating in research about services for children with reasons cited as ethical considerations, researcher skills, perspectives of childhood along with research design and approaches that can influence children's level of inclusion (Lundy, 2019; Halpenny, 2021). However, in this research project, it was important to consider adult's attentiveness within the process. This consideration included the analysis process and adults' looking beyond the drawing to consider children's intentions informing meanings represented, along with sequences of thought and action defining relationships, objects, and events depicted (Harrison 2014). These considerations informed the data collection methods which empowered children allowing them to contribute to the project for updating of the ALFs.

Countries such as Sweden and Scotland have utilized consultative processes with children. The use of these processes demonstrates the value placed on children as "citizens and learners" to contribute to the development and design of curriculum and resources (Harris and Manatakis, 2013, p. 9; James and Prout, 2015; Trevarthen et al., 2018). Children's voices assume central importance in research when reconsidering existing practices and policies designed to support their participation as active citizens in ECEC and OSHC settings. Swedish researchers (see Klerfelt and Haglund, 2014; Lager, 2016) report studies to examine workforce characteristics as well as learning curricula. In Scotland policy makers have legislated children's rights in policy to ensure voices are listened to and quality improvements achieved (Trevarthen et al., 2018). These examples motivated the ALF project researchers to consider the value in consulting with children in the updates.

3.1. Active participation: ethics, consent, and approaches

Thoughtful processes are required to ensure the integrity of gaining insights about childhoods and children's participation in ECEC and OSHC services from the inclusion of their perspectives. Seeking children's participation in research involved reflecting on research intentions with consideration of how their knowledge will be used to influence policy in ways that improve their lives (Johnson et al., 2014). Children need to feel that their agency and safety are a priority (Gibbs et al., 2018). These intentions should be reflected in promotion of the research and for the informed consent processes.

Lundy (2018) promotes selecting and developing research approaches and strategies to support children's involvement and their detailed recounts by adopting active listening and responding to them in a timely period. Rather than passive recipients of knowledge, children can be positioned as active agents who process and construct meanings and identities (Press et al., 2020; Smith and Coady, 2020; Hurst, 2021). However, given that children remain outside of major political and social power structures, their rights are only manifested through adults' perceptions and provisions for them. The researchers were cognisant of the paradoxical nature of children's rights and agency to influence their lives that need to be addressed before real and dynamic agency can be enabled to positively impact children.

Attempting to navigate these tensions, democratic participatory approaches offer children "a fuller range of participation," enabling *authorship* of their ideas and experiences (Blaisdell et al., 2021, p. 1). Such an approach examines children's agency against their participatory rights. Criteria is established to include reflection on the appropriateness of information communicated in response to children's capacities, opportunities for expressing experiences, and the influence of data generated on decisions affecting them (Mayne et al., 2018). One approach is to conceptualize capturing children's voices as a shared co-constructed process. Further recognizing children as capable research participants creates valuable insights into their worlds and a democratic approach acknowledges their views on matters of personal, community and global importance (James and Prout, 2015). This requires the use of creative methodologies to authentically engage and support children's contributions (Clark, 2017; Mayne et al., 2018).

4. An exemplar of children's contribution in the research design of the Australian approved learning frameworks update project

The task of the ALFs Update Project was commissioned by the Australian Children's Education and Care Quality Authority to ensure the Frameworks reflected contemporary knowledge in programs and practices used in ECEC and OSHC settings. The Frameworks are populated with examples of children's experiences and educators' practices. The project occurred across three sequential stages, and was supported by a detailed engagement strategy involving a broad cross section of stakeholders (children, educators, parents, managers, policy makers) linked to education and care settings. At each of the stages specific research tools and protocols were used to explore children's understandings and experiences (see Table 1: Children's involvement in the three project stages).

The research design was informed by a review of literature on researching with children, as well as ethical considerations informing their consent and ongoing participation in educational research (see Johnson et al., 2014; Lundy, 2019) was undertaken. This noted the benefits of adopting a participatory framework (Gibbs et al., 2018) in conjunction with using consultative policy approaches shaping children's educational experiences (e.g., Harris and Manatakis, 2013). The review also revealed the ethical, social and experiential forces influencing children's agency and their voice in research (Mayne and Howitt, 2015; Halpenny, 2021). Building on these findings, the research team developed specific/tailored protocols for engaging with

TABLE 1 Children's involvement in the three project stages.

	Stage 1	Stage 2	Stage 3
Research aim	To gather perspectives on the strengths of the ALFs and to identify opportunities for improvement.	To elicit stakeholder feedback on 20 opportunities for updating the ALFs, spanning the vision, pedagogy, principles, practices and learning outcomes	To respond to questions about the practices and principles used by educators during a 6 week period of the pilot of the updated frameworks
No of chn	$n = 105$ ECEC $n = 51$ OSHC (ages 2–12 years)	$n = 92$ ECEC $n = 92$ OSHC (ages 2–12 years)	$n = 148$ ECEC $n = 43$ OSHC (ages 2–12 years)
	Educators in 11 settings were asked to gather children's perspectives	An explanatory video was scripted to invite the children to participate, voiced by 8 year old child, available on the project website.	Educators provided artefacts - photographs and drawings collected during pilot period (6 weeks)
Questions asked	ECEC *What do you like doing? What is something we do not do here that you'd like to do?* OSHC *What is the best thing about out of school hour care? What activities do you do here that you do not get to do anywhere else? Describe your friends at out of school hours care? How could OSHC be better?*	*What does learning look like in ECEC/ OSHC? (Pedagogy)* *What do you think are the most important things educators do here at ECEC/ OSHC? (Relational Pedagogy)* *What is your favorite place to play inside or outside or things to do here at ECEE/OSHC and why? (Practices)* Some additional prompts *What is it like being here?* *How does that make you feel?* *Why is that important?* *What do you like about that place/game/experience/ activity?How do educators help you?*	Similar to Stage 2 *Tell me about what happened?* *How did you feel about what happened?* *How does it link to other things we do here, with your family or in your community?* *How should we do this in the future?*
Data gathered	Drawings; writing	Drawing, writing, transcripts of conversations	Drawing, writing, transcripts of conversations

children alongside other stakeholders. The review noted tensions associated with agency, inclusion and the use of democratically informed processes and representation (Doel-Mackaway, 2016; Dalkilic, 2020; García-Carrión et al., 2020; Parsons et al., 2021), as well as the benefits of adopting co-constructed forms of communication to fully capture children's perspectives (Blaisdell et al., 2021). Therefore, as part of the larger project, children contributed their perspectives about their experiences in education and care settings, including the qualities of the educators with whom they spent their time.

The ALF project researchers used multiple modes and methods for communicating with children. This ensured support to differing capacities for communication and expression (Johnson et al., 2014) and using developmentally appropriate pedagogical approaches (Arnott et al., 2020). These approaches prioritized relational and playful methodologies. The researchers developed protocols highlighting that trusting relationships were established, and that children were well informed about how their ideas are going to be used.

4.1. The participants

The children were aged between 2 and 12 years, attending either an ECEC or OSHC service across urban, regional, and remote areas of Australia. The educators at the ECEC and OSHC services were recruited to broker the research with children. As trusted figures in the lives of children, educators assumed a pivotal role in providing a

supportive and encouraging context to stimulate children's thinking about and response to specific research questions. The familiarity of the educators with the children was intended to alleviate the challenges associated with communicating with them. The choice of research tools was guided by the criteria of developmental appropriateness, language barriers and potential differential between adults and children (Pyle, 2013). Central to children feeling at ease in the research process was the role of the educator. Educators who know the children are critical to the research process to ensure full meanings about the issues being discussed are captured (see McCormick, 2018). Reflective of the diversity of children participating in Australian ECEC and OSHC settings, included were Aboriginal and Torres Strait Islander children, children from culturally and linguistically diverse backgrounds and children with a disability. The children's written and drawn contributions reflected their experiences in ECEC and OSHC services. The children were assigned identifiers that were linked to their contributions. Some children participated in all three stages (see Table 1: Children's involvement in the three project stages).

4.1.1. Ethical considerations

Researching with children and young people requires careful consideration of ethical practices (Kellett, 2011; Lundy, 2018; Cheeseman et al., 2022). Ethical approval was granted by the research team's University Ethics Committees (52021991827988 and 20210009395) and guided by the Early Childhood Australia's (ECA) (2016). In all three Stages explanations about assent were given. All children and young people were asked for their assent and had signed

consent from a parent/carer. Furthermore, in the invitation to participate, the research was explained with opportunities given to withdraw at any time. All data were de-identified and pseudonyms are used to report the findings in this paper.

4.2. The data collection process

The ALFs project placed significance on the potentials of creative methodologies with multiple forms of expression and these were used in three stages. Reflections on the use of these approaches foregrounds the development of a methodological framework for perceiving, connecting and expressing children's contributions in partnership with educators as co-researchers (Cohrssen, 2015). Educators were given briefings and written information on how to use a selected set of research tools with children. The research tools of talking circles, dialogic drawing and visual elicitation were used in integrated ways. A flexible inductive thematic analysis was used to examine the data by the researchers (educators were unable to be included in this part of the process as they did not have release from their everyday work). The thematic analysis was across the data sets looking for similar patterns, particularly to the similar questions that were asked in Stages 2 and 3. It had an analytical focus that looked for patterns of meaning and was also linked to the literature review (Barblett et al., 2021). The researchers had also made visits to all of the sites in Stage 3 so they were aware of the context in which children made their responses.

4.2.1. Research tools

Working in collaboration with educators, three methods: Talking Circles, Dialogic Drawing, and Visual Elicitation were used in conjunction with the research questions for each stage to gain insight into children's perspectives of their experiences in ECEC and OSHC settings. The researchers kept a diary of notes and reflections about the processes. No audio or video data were collected. Educators participated in focus groups with the researchers pre and post the data collection.

4.2.1.1. Talking circles

Talking circles are a guided conversational process (Cartmel et al., 2020). Talking circles are a relational model to support conversations with and between children in a culturally safe space (Schumacher, 2014). The format for a talking circles creates time and space for children to make connections and build trust with each other and the educator, making the way for open and genuine conversation. Each session starts with an activity designated as 'getting connected'. This is to help the children to get to know each other and build relationships. Then, it ends with a closing activity that involves children and educators reflecting on what happened for them during the session. During this project, the educator was asked to make a written record of the children's responses to the question 'what have you heard or thought about during this conversation that is interesting or important'.

4.2.1.2. Dialogic drawing

As a recognized form of communication and source of data (e.g., Kress, 1997; Pahl, 1999), drawings provide children with a powerful means to express their ideas and experiences. With a focus on meaning-making, symbolism within children's drawings offers

insights into their understanding of events and issues affecting their lives (Wright, 2007). Whilst engaged in processes of creation, children often communicate their intentions, with drawings-in-action shaped by reflective 'tellings' (Wright, 2007). Attending to children's dialogic reflections not only reveals their process, but also helps to clarify what they know and key people of importance and connection (Coates and Coates, 2006; García-Carrión et al., 2020). Building on the work of Einarsdóttir (2011) using draw and talk methods as an intentional strategy, Ruscoe (2021) further developed this method and named it 'dialogic drawing'. In this project, educators were asked to prompt children to make a response, listen respectfully, pause for children to draw, and then clarify children's representations and comments. Some educators annotated the children's drawings as part of the process, particularly the contributions from children under 3 years of age.

4.2.1.3. Visual elicitation

Visual elicitation can involve drawings or photographs to prompt conversations (Bagnoli, 2009; Orr et al., 2020; Shaw, 2021). Using visual prompts provided by children can help to negate privileged adult interpretations as they capture children's voices. Further, it is recommended that children are active participants in the data collection. This means that photographs used in the research process are the ones taken by the children. This can empower them to share meanings more openly thereby facilitating richer data. In this project, some of the concepts linked to the update of the practices and principles of the Frameworks were abstract so the use of photographs or drawing co-constructed by the children were valuable.

4.3. Results – what children communicated

The children's drawings and conversations documented by educators were analysed through an iterative process (Cohen et al., 2017). The drawings were analysed for their content as to what they depicted, applying the principles of open coding and inducing categories from common content in the drawings (Merriman and Guerin, 2006). The practices of the educators emerged as a theme when the data were coded. The data collected from the various methodologies were themed for common ideas and it was also categorized into the principles and practices as described in the ALFs. The children's responses offer unique insights into the quality of the education and care workforce. The majority of the children's responses in the theme about the practices of educators exposed the multiple roles that educators undertook to meet the requirements of the children attending the service:

"Educators should 'protect and entertain' kids and love being outside but also going to the school library. My OSHC is a good time to play with my friends and I like it when educators teach us new skills such as knitting. It is also a 'really good idea' to talk with Educators if you have a problem. The most important thing about OSHC is 'being protected by adults" (Chloe, 10 years, Stage 2, Talking Circle).

The knowledge and abilities of educators to establish and maintain relationships was the top priority for children. They valued communication skills highly. The children also acknowledged that educators' knowledge and understanding of child development was significant. The communication skills of educators were valued by children as they identified the educators as someone that would

be responsive to them when they felt they needed help from a trusted other. Examples of their perspectives are:

Yvonne (11 years, Stage 2, Talking Circle): "*I have made some good relationships with specific educators and if I have a problem I feel comfortable talking to those educators.*"

Wade (4 years, Stage 2, Talking Circle): "*I like being here, the educators make me feel safe.*"

Children spoke about the practices of educators. The children also listed personal qualities they looked for in their educators.

They were mindful of the practices used by educators in undertaking their responsibilities.

Emma (10 years, Stage 2, Talking Circle): *'believes that an educator should be 'confident, have a sense of humour but not be too nice'.*

Lionel (4 years, Stage 2, Talking Circle) shared: "*A good teacher is someone who is smiley.*"

Children also listed the kinds of support they needed to help develop their capabilities and confidence.

Michael (5 years, Stage 2, Talking Circle): "*Grown ups help me to learn when I cannot do something.*"

Isabel (3 years, Stage 2, Dialogic Drawing): "*My teachers teach me to dance to music.*"

Eva (7 years, Stage 2, talking Circle): "*They take care of us for fun activities and help you cook things.*"

In an ECEC setting, the children described how educators helped them to learn.

Ronald (5 years, Stage 2, Talking Circle): *"When we learn, we sit on the mat and cross our legs and look at the teacher. Our teachers are kind to us.*" In OSHC settings where children are more independent and seeking to manage their time and activities one child noted that educators allow them time and space to pursue their interests. Anya (9 years, Stage 2, Talking Circle): "*What the educators do or do not do is important.*"

The children reported information about the relationships with educators. They described what they perceived to be important for the workforce of educators, for example understanding of children's development, in particular social development and emotional wellbeing, their interests, ways to organise the indoor and outdoor environments that are available to them.

Most responses from children about the support given to them was about meeting their physical and emotional needs. For example:

Dean (9 years, Stage 2, Talking Circle): "*Teachers always care and give us food.*"

Jana (3 years, Stage 2, Talking Circle): "*I only like cuddles from some teachers if I am sad saying goodbye to my mum. They help me if someone is mean to me.*"

Children talked about educators with knowledge of first aid and helping them when they are unwell as important. For example:

Elise (12 years, Stage 2, Talking Circle): *Noticed that the staff who are studying nursing often put their hand up to provide first aid which she thought was 'cool'.*

Reflecting on a desire for agency, children noted the different qualities of educators who provided them with opportunities to 'have a say'.

Children are social participants in their own right with power and agency. For example, in a dialogic drawing opportunity, a younger child expressed their value for educators' support when making decisions (see Figure 1):

"*This is me putting the rubbish in the garbage bin. The teachers help me decide where things go.*"

The children made varied comments about practices of the workforce of educators. The children noted a higher level of engagement in the education and care setting when the workforce and the environment were presented to them in certain ways. The children answered the questions with responses about the principles and practices of the workforce that contribute to quality education and care settings. These practices can be used as criteria in the processes of assessing quality. In addition, they could be used to inform the recruitment of educators who practice in ways that improve the lives of children (Johnson et al., 2014). The children made positive comments about all aspects of the service delivery.

5. Discussion

This research shows that children can contribute to assessing and describing their experiences in rich and meaningful ways. It highlights the importance of using research methodologies with children alongside supportive educators. This process can uncover and transform understandings about the quality of the experience and interactions with the educators in education and care settings. Children were able to convey the significance of experiences that could be used as an assessment of quality.

The exemplar of the ALFs research project underlined the strengths of adopting a multi-layered approach for uncovering children's perceptions and ideas about ECEC and OSHC settings. Each chosen approach (by 'doing' something different) assisted the researchers to piece together the ideas contributed to form a more complete picture of children's experiences in ECEC and OSHC. This, in turn, provided important insights into their expectations of settings that makes them feel safe and valued, and provides opportunities for them to engage in play, leisure and learning experiences. The theme about feeling safe occurred across all age groups. The data included references to emotional and physical safety. Educators should heed this information when assessing children and young people's learning and wellbeing. Policy makers and service leadership should heed this underpinning knowledge in workforce development plans and developing assessment reports. Children's agency should be recognized and respected in ECEC and OSHC settings. The National Quality Standard provision of child-centred practice requires educators who can elicit and respond to children and young people's perspectives. Quinn and Manning (2013) assert that in order to inform policy and the provision of high quality education and care, there is a need to gain children's perspectives rather than relying on adult perceptions of children's perspectives.

The recognition of children and young people's perspectives is, therefore, imperative to ensuring child-centred practice is at the forefront of everyday assessment practices.

5.1. Reflections on tools, processes and relationships

Educators that participated in the process remarked on the depth of knowledge that the children expressed about the characteristics and qualities of the workforce (Researcher Diaries). As reflected in

FIGURE 1
David (4 years, Stage 2 dialogic drawing).

children's responses, there was great awareness of the educators' role, with importance placed on emotional connectedness, enjoyment of learning, and establishing an environment of care for each other. For instance, Henry commented- *"The teachers do everything. It's good being here"* (Henry, 4 years), another stating- *"Pick up scissors if someone is barefoot. Teachers look after the group. Teachers are nice to us. It's fun at pre-school."* (Kelly, 4 years), and *"I'm happy when I learn and have rest time. Teachers help us to make the right choices."* (Tina, 4 years).

The educators were surprised at how willing children were in contributing their ideas (Focus group: Educators). This was purposefully supported in the research design as processes were focused on relational and playful methodologies, reducing adult-child power imbalances.

5.1.1. Relational methodology

Children have always communicated with adults. However, a deeper appreciation of how this communication plays out in the complexity of the systemic features of education and care services is needed. An understanding of how to communicate with those not yet classified as adults is increasingly a skill one needs to have. Key to this is understanding how to build secure relationships. This requires time to spend 'going alongside' children in their everyday lives (Noonan et al., 2016) and the adult does not view themselves as more superior in the communication process. In this way children and young people will engage in conversations between themselves and adults to make meaning together. So, as adults are listening and talking, they are mindful of interpreting and co-constructing meanings about the content of the conversations with children and young people. As Noah 4 years said: *"I think educators should ask us lots of things. We know lots of things."* Adults who are self aware provide children and young people with an environment where they will feel confident and safe to express themselves.

5.1.2. Playful methodologies

The creative methodologies used in this research project were playful approaches. Gathering the voices of children does not always happen easily. When researchers use play and playful behaviors to interact with children, they will find they relate to more easily to children (Zosh et al., 2018). As noted in the response by Didi 5 years: *"My educators keep me safe and play with me. If I am 'really sad' I can talk to them comfortable to talk to an educator."* Children express their pleasure in playing and like their interactions with the adults who play with them. In addition, play can be a tool used with children in order to get to know them and to build trust with them. Building trust creates safe spaces where children feel confident to be accepted for who they are and to express their ideas about the matters that affect them.

5.1.3. Cautions

There are alternative perspectives to gathering the voices of children. In particular, there is a consciousness that children may not want to invest time in an adult agenda such as an investigation about the qualities of the workforce. Children may be intent on participating in their own agenda of play and leisure pursuits and not prioritize the opportunity the adults give them to have a say about policy matters, such as the workforce. If researchers are to include children's perspectives in research requires thoughtful and inventive ways to ensure the approaches meaningfully capture their voices (Mayne et al., 2018). Gibbs et al. (2018, p. 93) use the term as *co-researchers* to acknowledge and reflect the way in children's contributions are made. Researchers are reminded to reflect on the research intentions of seeking children's participation. Consideration should be given to how children perceive the relevance of research to their lives and how children's knowledge will be used to influence practice in ways that improve their lives (Johnson et al., 2014).

Children may ask how their views are being used. Researchers who engage with children should discuss with children how their views have been heard and used.

5.2. Assessing using a multilayered approach

The meaning making experiences using creative methodologies provided a process for children to express their ideas about matters that affect them. This included their perspectives on the physical and social environment, the qualities of the children's services' workforce and the policy and practices embedded in the functions of providing care and education for them.

The involvement of trusted educators across all stages of the project supported access to children's perspectives of their experiences in ECEC and OSHC contexts, providing opportunities to understand more deeply what they valued (Ergler et al., 2015; McCormick, 2018; Halpenny, 2021). Using methodologies such as talking circles, dialogic drawing and visual elicitation can also positively impact developing tools to the assessing the quality of the outcomes for children in ECEC and OSHC settings. These methodologies may have also contributed to the lack of adverse comments made by the children. The use of additional prompts may have expanded the breadth of children's comments. Knowing more about children's expectations can help to provide a more authentic understanding of the demands of professional work and pedagogical practices.

6. Conclusion

The perspectives of children need to be highlighted in assessing quality of ECEC and OSHC settings. If adults are able to consider children's perspectives, then it is possible that children will acquire the skill to see adults' perspectives. The ability to understand each other's perspectives is pivotal to the development of secure and reciprocal relationships between children and the adults who work with them and to assessing the quality of requirements for example the National Quality Framework. Acknowledging children's perspectives are different to adults, ECEC and OSHC settings are modeling a fundamental skill that will support children to acknowledge and assess their own learning, development and wellbeing.

The update of the Australian ALFs has been a valuable opportunity to gather the voices of children to have a say on matters that affect them in policy and practice. This project used methodological tools that prioritized children's voices for assessing the vision, pedagogies, principles underpinning practices, and

learning outcomes that educators are expected to use in their daily work. The contributions of children have extended beyond just listening to their ideas. Children's responses have provided meaningful insights about perceptions about quality, responsive environments, self-care, and relational pedagogies. This information will be invaluable to supporting ways to assess and improve the quality of settings for children.

Data availability statement

The datasets presented in this article are not readily available because the data sets are unable to be shared. Requests to access the datasets should be directed to fay.hadley@mq.edu.au.

Ethics statement

The studies involving human participants were reviewed and approved by the Macquarie University Ethics Committee. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

JC, SI, LH, LB, FB-H, and FH contributed to conception and design of the study. JC, SI, LH, LB, FB-H, LL, and FH performed the statistical analysis and wrote sections of the manuscript. JC wrote the first draft of the manuscript. All authors contributed to manuscript revision, read, and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Pockets of promise: exploring innovation and complexity of remote ECEC service delivery in Australia

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Introduction: The existing funding architectures for early childhood education and care (ECEC) services in Australia are incompatible with the needs of remote and First Nations communities. The Australian system relies on a market-based model for ECEC – characterized by demand-led funding mechanisms where funding flows to users to choose what service to use. This model is not viable or sustainable in remote and First Nations communities. In this paper, we ask what we can learn from alternative models of ECEC that serve remote, largely Indigenous communities.

Methods: This research is based on interviews with 10 key stakeholders. Potential participants were identified using three selection criteria which established their expertise in relation to: advocacy and experience in delivering ECEC services in remote locations (evident in relevant parliamentary reviews and inquiries), in-depth knowledge about First Nations perspectives about ECEC models, and broader understandings of the ECEC system in Australia. Three themes were explored in the interviews: (1) funding context (including impact of recent changes to Budget Based Funding, and role of philanthropy in the ECEC sector); (2) Quality and regulatory context (including workforce challenges and cultural considerations); and (3) Future research (including research gaps, opportunities, and considerations). The study design and analysis of data was guided by policy studies frameworks that advocate for collaboration and coordination among researchers and stakeholders in order to address complex problems.

Results: Analysis of the interviews illuminated the complex structural and cultural elements shaping the design of, and access to, ECEC in remote communities. Stakeholders argued that the ECEC system should be universal in that it delivers services that meet the needs of young children and their families. This requires the development of a definition of 'universality' that enables communities to define their own ECEC needs and the types of services best suited to meet those needs. Stakeholders' views about the importance of community-led design and delivery highlighted the need to align structural and cultural aspects of quality standards and workforce needs, and also to strengthen consultation with First Nations organisations to better understand community-specific solutions.

Discussion: The paper outlines the complexities and nuances of ECEC service delivery in remote communities. The findings are intended to foster discussion about current initiatives, challenges, and futures possibilities for ECEC in remote communities in Australia. These findings concur with other research that argues for community led service delivery and for stronger equity-based partnerships between First Nations and non-First Nations researchers and organizations.

1. Introduction

Advocacy groups argue that early childhood services are essential for strong First Nations[1] child outcomes in the formative 0–8 years. Longitudinal research has clearly demonstrated that sustained engagement in high quality early childhood education and care (ECEC) can narrow the educational achievement gap between children from marginalized communities and their better-off counterparts. However, it is well recognized that the policy architectures and funding models that underpin Australia's ECEC system are incompatible with the service needs of First Nations communities. This problem is not uniquely Australian. Urban (2015) observed that ECEC policy across EU countries fail to serve marginalized populations effectively. He argues that European Close the Gap and ECEC policies are based in the hegemony of western ideals – workforce participation and education that builds human capital – and that policy is out of step with the everyday needs and cultural priorities of many marginalized groups. Like European ECEC policy, Australian policy settings do not yet deliver a system that is accessible and responsive to the needs of many families. These failures are most pronounced in the case of Indigenous families and remote communities. SNAICC, Australia's peak advocacy organization for First Nations children, emphasizes that early childhood services must be '*accessible for and effectively engage with families*' and stress the importance of local consultation about community needs.

The scale of policy failure is evident in statistics that capture the availability of ECEC places across the community and the developmental outcomes of First Nations children, whom are overrepresented in remote communities. In a study that combined licensing data for services in two Australian states, plus census data showing characteristics from local areas in which the service is located, researchers found that children from small and remote communities are more likely to miss out on high quality ECEC (Cloney et al., 2015). This trend continues in spite of targeted government investment. Recent research using data from the Australian Children's Education and Care Quality Authority (ACECQA) data found that "the current policy settings means that many towns with a population under 1,500 lack childcare services" (Hurley et al., 2022, p. 33). Similar findings from Canada demonstrate this inequity in access is a common trend in countries that operate with a market model (Prentice and White, 2019).

Of all the states and territories in Australia[2], early years education policy failures are most stark in the Northern Territory (NT) where

there is the largest concentration of First Nations people in *very* remote communities. In the NT, Indigenous people make up 89.6% of people living in very remote areas. Indigenous disadvantage and disparity occur most acutely in remote and very remote areas (Gregory, 2022). In the Northern Territory specifically, First Nations children aged 0–5 years represent 39.8 per cent of the community, yet only 15.9 per cent of children participate in approved childcare services (Productivity Commission, 2022, Table 3A.12). The impact of poor servicing is reflected in children's outcomes data. The Australian Early Development Census (AEDC) shows that First Nations children from remote and very remote locations are more than twice as likely as those living in major cities to be developmentally vulnerable on one or two (out of five) domains (Commonwealth of Australia, 2019).

The challenge of developing policy settings responsive to the needs of Indigenous and remote communities is not new. Policy makers and researchers have been grappling with the problems and trialing solutions for decades (Fasoli et al., 2004; Fasoli and Moss, 2007; Brennan, 2013; SNAICC, 2015). Current policy initiatives, including the Productivity Commission's inquiry into Universal Early Childhood Education and Care (Productivity Commission, 2022), the Closing the Gap Implementation Plan (Commonwealth of Australia, 2021) and NIAA's Close the Gap Implementation Plan (National Indigenous Australian Agency, 2021; National Indigenous Australian Agency, 2023), highlight the ongoing urgency of addressing barriers in the current policy system. Some Indigenous communities have stopped waiting for government action and have moved away from government supported services. They have developed ECEC services in line with community priorities and need.

In this paper, we ask what is not working; and, what we can learn from alternative models of ECEC that serve remote, largely Indigenous, communities. We know that services developed outside of the 'formal' service system often move beyond the circular problem definitions that drive policy (Urban, 2015). Much of the research that informs ECEC policy development construct the achievement gap 'problem' in terms of children missing out on the early education *that is currently on offer*. In this logic, the solution of 'increased participation' is narrowly conceptualized in terms of existing models of ECEC. This eclipses the question of whether some families do not participate in ECEC because the education on offer does not meet their needs or is delivered in a way that is hard to use. Urban turned to countries outside the EU to explore what a competent ECEC system might entail when it is developed to meet social priorities other than those enshrined in OECD and European policy.

In a similar vein, we have asked Australian Indigenous and non-Indigenous stakeholders, with knowledge about ECEC in remote communities, what is needed for an inclusive ECEC system. We offer this paper as two non-Indigenous ECEC policy researchers at a time when the Australian government has again turned its attention to universal ECEC provision (Productivity Commission, 2023). We are not experts in service delivery in remote communities or the needs of young children in these communities. However, we strongly believe

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1   The terms First Nations, Indigenous and Aboriginal and Torres Strait Islander are used interchangeably to reflect the context and source or reference.

2   Like Canada, Australia has three levels of government – Federal, State and Territories, Local governments. Education funding is primarily delivered *via* State and Territory governments.

the needs of remote communities should not be sidelined as governments work to lift their game on universal ECEC provision and deliver a national early years strategy. We ask about the needs of services in remote communities in terms of how funding is delivered and quality is supported. Furthermore, we explore what can be learnt from communities providing services for their young children that are 'out-of-scope' of the mainstream system. What do these community-controlled out-of-scope services tell us about being user friendly for families? What and how are children learning? What are the concepts of quality that drive service delivery? What knowledge, practices and arrangements in these services could strengthen the capacity of mainstream systems to be inclusive? What are the research priorities for ECEC advocates and organizations in remote communities?

Before turning to our method and findings, we offer a sketch of the Australian system and key policy developments aimed at addressing issues of ECEC access and quality in Indigenous communities, with particular attention on the NT. This overview provides insights into why communities would source their own funding for services for children's wellbeing and development. From here we describe our study, its methods, and participants. We explore how these stakeholders saw the impacts of existing policy on communities, what universal provision and quality standards means from an Indigenous worldview and what is needed moving forward.

2. Background

2.1. The Australian ECEC system

Australian governments continue to spend less on ECEC (relative to Gross National Product) than most OECD countries and far less than Nordic countries. Accordingly, Australian households pay more towards ECEC services than other countries (Grudnoff, 2023). The Australian system is based in a mixed market provision delivered through government, for-profit, not for profit and community-based providers (Adamson and Brennan, 2022). Furthermore, there are significant differences in each of these broad provider groups. Some for-profit organizations are large multi-national listed companies making profits for shareholders, while others are small family-run businesses. Australia has three tiers of government – federal, state and local. The Commonwealth government funds ECEC services through demand-led funding mechanisms that emphasize user 'choice' and directs funding to users to spend in the 'approved' service they choose. They also fund some targeted programs to support inclusion and the National Quality Standard which sets consistent minimum standards across the states and supports quality improvement over time (Brennan and Adamson, 2014). The state governments vary in terms of what they deliver – direct funding to services and/or funding support, and in some jurisdictions local governments also are involved in funding and delivering ECEC services. The logic behind the mixed market model is that service providers compete for consumers because they rely on full utilization to be financially sustainable. This competition is meant to drive up the overall quality in the system (Newbury and Brennan, 2013).

The mixed market model does little to support service viability, sustainability and quality in many remote communities (Standing Committee on Employment Education and Training, 2020; Centre for Policy Development, 2021; Hurley et al., 2022). Market models

incentivize providers to establish services in larger and more advantaged locations where demand is higher (Hurley et al., 2022, p. 33). There is little to incentivize providers to deliver services in 'thin' markets where there is limited demand (Penn, 2009). Even with state governments and philanthropic organizations stepping into 'thin' markets, there is no guarantee or entitlement that all children can access ECEC (Centre for Policy Development, 2021). The Northern Territory is a geographically large jurisdiction in the north of Australia. It has a population of over 200,000 people, with over 25 per cent Aboriginal or Torres Strait Islander background, compared with approximately 3.2 per cent in the rest of Australia. The Northern Territory also has a higher proportion of children 0 to 4 years (7 per cent), compared with the rest of Australia (5.8 per cent) (Australian Bureau of Statistics, 2021). The NT is characterized geographically by its remote communities, home to mostly First Nations people.

2.2. Policy context of remote ECEC delivery

It is well recognized across government portfolios that the financial viability of services in remote locations cannot be assured through market approaches. Historically, Indigenous-focused ECEC services have been established under a variety of supply-side funding programs to address the issue of financial viability. In 2003, these were consolidated into the Budget Based Funding program (Department of Social Services, 2021). The BBF program was designed to *"provide access to childcare in communities where mainstream or conventional childcare services are [sic] not available or viable, and where there is a need for culturally competent services, in particular Indigenous focused childcare"* (ANAO, 2010, p. 39). Importantly, it provided flexibility for communities to identify their own needs and to fund specific wrap-around supports that met those community needs – such as providing transport or services for older children (Fasoli and Moss, 2007). A further 38 Aboriginal Children and Family Centres (ACFS) were established under the National Partnership Agreement on Indigenous Early Childhood Development in 2009 (Brennan, 2013). The BBF and ACFS models supported service integration so families could access an array of health and education services from a single-entry point. Integrated child, family and community services are widely recognized as best practice in Indigenous and other disadvantaged communities (SNAICC, 2012a,b; Brathwaite and Horn, 2019; Moore, 2021).

In 2013, a review of these Indigenous-focused ECEC services found that holistic community-led services built on community strengths to address a wide range of physical, social, emotional and learning work. The review noted that these services had much greater scope to address complex community needs than mainstream ECEC services. They provided a trusted community-owned entry point to tackle the trauma, poverty, dislocation and disempowerment faced by many First Nations families. Communities and families could determine the learning priorities for their children and galvanize the rich learning opportunities in remote communities. Children were able to build their capabilities in line with the cultural practices and kinship arrangements of their own community including 'community languages, bush tucker and navigating the bush, and care for country' (Brennan, 2013, p. 5).

Community control is a critical element of 'what works' in ECEC in Indigenous communities (Fasoli and Moss, 2007; SNAICC, 2012a,b). It is important to note that the funding mechanisms of the

BBF and ACFS services emphasized community control and local flexibility and so were more responsive to community needs than the subsequent policy. However, there were significant sustainability issues not addressed by these programs. Most BBF services had poor quality infrastructure and found it difficult to recruit and retain qualified staff (Brennan, 2013). Further, BBF services were excluded from the provisions of the ECEC system that monitor and support quality improvement (Department of Education Employment and Workplace Relations, 2012).

Funding for the BBF program and the ACFS was only assured until 2014. In 2018, the Commonwealth increased expenditure and restructured the subsidies and targeted programs under what became known as the Child Care package. Under this umbrella, many Indigenous focused services were formally transitioned to the demand-side market model (with targeted grants including one funding stream restricted to these services – Community Child Care Fund-Restricted). Early reviews of the impact of a demand-side funding model had already indicated that for services to break even fees would have to be up to or over $100 per day. Further, the strict eligibility and administrative requirements made it impossible for many families to claim subsidies. Importantly, eligibility requirements mandate the number of 'allowable' absence days. This requirement, based on workforce norms, does not reflect where and how children's learning takes place and the cultural obligations that generate belonging in Indigenous communities (Brennan, 2013). The evaluation of the Child Care package found the change in policy had significant *negative* impacts on over 65% of former BBF services. The evaluation noted that policies were driving former BBF services to change what they deliver and many now 'no longer respond to the community's circumstances and needs' (Bray et al., 2021, pp. 317–318). Moreover, the evaluation found that targeted grants (CCCF-R, Inclusion funding etc.) were not designed in a way that is easy for services or communities to use, the restricted grants were small and did not enable adequate infrastructure development, the package as a whole did not support service integration (Bray et al., 2021).

Under the BBF program, services fell outside of the remit of Australia's National Quality Standard (NQS) that mandates the level of quality in services eligible for federal demand-side subsidies. Most studies that review service quality in Australia utilize data from the NQS so little is known about quality in Aboriginal controlled ECEC services. Indigenous advocacy groups argue the need for high quality in Indigenous-focused services but caution that the notions of quality that manifest in regulations and quality standards do not align well enough with the cultural priorities and knowledges in Aboriginal and Torres Strait Islander communities or with the resources at their disposal (SNAICC, 2019a). There is a handful of studies that have investigated the adaptability, implementation, appropriateness, and acceptability of evidence-based programs in ECEC (Elek et al., 2022). SNAICC produced service profiles of good practice of Budget Based Funded services across Australia (SNAICC, 2015). These service profiles, and other studies (Fasoli et al., 2004; Hutchins et al., 2009; Bowes and Grace, 2014; Leske et al., 2015; Harrison et al., 2017) demonstrate that quality manifests differently when culturally informed practice is central to service provision.

While there are many aspects to quality, Dr. Sue Lopez Atkinson observes that 'one of the real differences between western pedagogy and Indigenous pedagogy is the position of Elders as knowledge-holders: "I think the position of elders as teachers is not as prominent in some western communities. So knowing you need to consult with someone before doing particular things might be quite alien to some practitioners. You cannot do what you think is appropriate, there are times you need to contact someone and say 'is this appropriate? Is this respectful'. So … practitioners need to exercise patience, because our Elders have got huge responsibilities within their own communities, locally and internationally" (Atkinson, n.d.). This observation offers a process for defining quality in First Nations contexts.

2.3. Policy goals, calls for action and action

Improving early childhood outcomes for First Nations children is an enduring but unmet aspiration of Australian policy. The Closing the Gap Implementation Plan (Commonwealth of Australia, 2021) includes a goal to increase the proportion of First Nations children enrolled in ECEC in the year before fulltime schooling to 95% by 2025. The Aboriginal and Torres Strait Islander Early Years Strategy asserts the need to "improve early childhood education and care programs and funding models to increase access and engagement for Aboriginal and Torres Strait Islander children" (Commonwealth of Australia, 2021, p. 17).

In remote NT communities, these goals are compromised by ongoing funding uncertainty (SNAICC, 2018; Standing Committee on Employment Education and Training, 2020). Since 2018, 46 NT services have lost BBF funding, and 41 of the 225 early childhood education and care services are out-of-scope of government funding and regulations. Policy makers and key stakeholders have identified the urgency of developing a new funding model designed to sustain existing services, and expand promising practice models to more remote locations (Centre for Policy Development, 2021). The paucity of research into quality and 'what works' in remote communities has been repeatedly identified as a problem. There is a need for monitoring the effects of policy and for building an evidence base on service arrangements and practices that fall outside the remit of current policy structures.

The Select Committee on Work and Care recommended the Australian Government commit to long-term increases in funding to First Nations community-controlled Early Childhood Education and Care, with a particular focus on regional, remote and some urban areas" (Select Committee on Work and Care, 2022, p. xiii). In 2020, SNAICC proposed three evidence-based measures to ensure First Nations children can access quality ECEC. This included a minimum of 30 h per week of 95% subsidized care per week, a sector development initiative to establish regional intermediary services to build capacity, an alternative community focused funding program for Indigenous focused services.

These calls for action resulted in increases in investment in the October 2022–23 Budget. The government committed to subsidizing up to 36 h per fortnight of ECEC for First Nations children. However, this commitment falls short of assuring all First Nations children can access quality ECEC as it is focused on childcare places *in mainstream services* and amounts to 18 h per week. The budget also included $10.2 million over 3 years from 2022–23 to establish the Early Childhood Care and Development Policy Partnership with Coalition of Peaks and First Nations representatives to develop policies on First Nations early childhood education and care (Department of Education, 2023). This second investment can

potentially support an alternative funding program and intermediatory capacity building services.

Several First Nations communities and organizations have developed early childhood education and care services outside of the formal service system of funding and regulation. These services (often called out-of-scope) rely on philanthropic funding and short-term grants from government agencies (see Barhava-Monteith, 2020; Children's Ground, 2020). They operate on varying models of service provision around the NT, and elsewhere, and are delivering innovate, culturally safe early childhood services. Examples include Indi Kindi, Children's Ground and mobile services such as the Katherine Isolated Children's Services (Katherine Isolated Children's Service, 2020). Other Government programs, such as Families as First Teachers (Page et al., 2019; Gapany et al., 2022) and KindiLink (Barblett et al., 2020) are demonstrating positive impact for the communities they serve.

While these services can offer enormous insight into the question of what works in remote communities the models are not currently well documented (with the exception of examples noted here). Children's Ground – a community-led and evidence-based model of service delivery that is committed to combining First Nations and Western learning and development – is also calling for better monitoring of what works. They note 'there is still no clear understanding or documentation available about homelands/ outstation service delivery across the NT' (Children's Ground, 2020, p. 10). This absence of documentation about many remote services creates barriers to identifying gaps and opportunities for reform. This paper contributes to this gap with findings of a small pilot study that sought the perspectives of stakeholders who have diverse, insider perspectives on remote service delivery.

3. Method

The findings from the study are based on interviews with 10 stakeholders with knowledge and expertise of the ECEC landscape and community needs.

3.1. Theoretical framework

The study aimed to better understand the complexities and identify promising practices related to funding, regulation, and research to improve ECEC service delivery in remote communities. It is grounded in critical policy analysis and the recognition that the design and delivery of ECEC in remote communities, and for First Nations families, can be considered a 'wicked policy problem' that requires systems thinking, collaboration and coordination (Head and Alford, 2015). As such, the study is inspired by a solution driven research approach that prioritizes research that is relevant to partners, stakeholders and end users (Western, 2019). In this way, the study was designed to identify solutions to ECEC delivery in remote communities and identify opportunities to collaborate in future research. Given the study was undertaken as a pilot project to inform a longer-term research project in collaboration with First Nations organizations, the study was also informed by community-based participatory research with First Nations organizations, particularly an openness to learn from each other, have trust and prioritize community leadership (Snijder et al., 2020).

3.2. Sample and recruitment

Stakeholders were identified primarily through relevant parliamentary reviews and inquiries with a strong focus on the Productivity Commission inquiry into expenditure in the Northern Territory (Productivity Commission, 2020), and the 2020 Parliamentary inquiry into education in remote and complex environments (Parliament of Australia, 2020). These inquiries specifically sought submissions from organizations and service providers with an interest and expertise in improving access to ECEC services for children living in remote communities, and thus offered rich data and context for understanding key stakeholders with expertise.

The first author, Elizabeth Adamson invited the participants using publicly available contact information and, in some instances the researcher had contact information for professional contacts. Stakeholders were also identified and invited via the author's professional networks, some of whom also had contributed to one of the above inquiries. Stakeholders were asked if there were any other stakeholders who may be interested in participating, with three of the 10 participants ultimately being recruited through this snowballing method.

The participants were selected based on their known expertise in advocating for and delivering ECEC services in remote locations, their broader understandings of the ECEC system in Australia, and local perspectives about ECEC models for First Nations children. Of the 13 organizations and stakeholders identified through submissions to the above inquiries and known professional connections, three First Nations organizations did not respond to invitations or declined to participate in the study. It's understood the reasons were due to not having organizational capacity, as well as internal ethics processes that made participation difficult for a project of this small scale. Half of the interview participants ($n = 5$) had a particular focus on the Northern Territory. Of the 10 participants, three were First Nations stakeholders, or were employed by an Aboriginal or Torres Strait Islander-led organization or service. Of the remaining seven participants, three had NT-specific experience and/or perspectives, and four had broader ECEC policy and sector expertise with a particular focus on servicing or advocating for remote and disadvantaged communities. Two interviews were undertaken face-to-face, and eight were undertaken via Teams/Zoom video conferencing.

3.3. Analysis

The semi-structured interviews were guided by three themes: (1) funding context (including impact of recent changes to Budget Based Funding, and role of philanthropy in the ECEC sector); (2) Quality and regulatory context (including workforce challenges and cultural considerations); and (3) Future research (including research gaps, opportunities, and considerations).

The first author tested the interview topic guide and research questions with two stakeholders. The interview guide was adapted throughout the interviews to align with the participants' own expertise and background, and to ensure their own priorities, views and concerns were not restricted by narrow questions, or the author's pre-empted research interests. With participants' consent the interviews were voice recorded and transcribed. The transcripts were uploaded to NVivo, where the researcher undertook an initial analysis to identify the key themes that emerged. These themes broadly aligned with the research

questions' focus on funding, regulation, quality and research gaps, yet other themes and sub-themes emerged. Using an iterative approach to analysing the data, both authors reviewed and adapted the themes to better capture the nuances of the participants' views, particularly in relation to literature, policy papers and developments that reflected the background of the study (outlined above). This second round of analysis informed the identification of the three key themes, presented below, in relation to: funding complexities and the concept of universality, Community-led delivery and cultural knowledge, and workforce challenges and prioritization of local staff.

3.4. Ethical considerations

The team was committed to undertaking this research in a culturally informed and ethical way. It received Ethics approval from the UNSW Ethics Committee (HC220477) and the Top End Ethics Committee (HREC-2022-4394). The project was designed to ensure the perspectives of First Nations individuals and organizations were sought and their unique expertise recognized. Given the importance of research about First Nations people to be led by First Nations people (NHMRC, 2018), the authors were cognizant to not assume research questions were relevant or priorities of participants. The interview questions and protocols encouraged participants to talk broadly and define their own priorities for ECEC policy and delivery.

4. Results

4.1. Untangling effective funding and service design for remote communities

Stakeholders talked at length about the complexity of the different funding streams, and various changes in recent years. There was overall consensus that the current, and recent, programs are not successfully tackling the challenge of equitable access to ECEC for families in remote communities. While the quote below refers to the Northern Territory context, this sentiment also captures the view of stakeholders from other regions.

> So I think that there's been ebbs and flows and changes in the challenges of remote delivery that governments have dealt with - the NT government have dealt with in various ways but never achieved equitable service delivery (Stakeholder 4).

Stakeholders noted that targeted funding streams like the BBF program were developed because government *recognized* that a market model does not work in remote communities. In spite of this recognition, new governments sometimes tried to reimpose market models:

> there was quite a swing away from that [BBF approach] and towards bringing many services within what we might think of as a more market based or market-oriented idea of funding. […] but I'm hoping that with the current government, there may be some recognition that that's not an appropriate approach to funding certainly for remote communities and possibly for other communities as well (Stakeholder 1).

A couple of stakeholders referred to how the layers, or intersection, of funding and programs create complex circumstances for services and families, whereby funding seems to cancel each other out, hindering service sustainability. In the following quote the stakeholder observes the service could seek state/territory funding for a preschool program, they could seek funding for operational costs via a federal funding stream for Indigenous services and/or could seek subsidies for families via the mainstream federally funded CCS program. They explained that:

> the preschool would be fully funded if that's approved, for a short period of time. But from my understanding the CCCF-R guidelines don't allow for two funding models. So we have to look at how that can work. And there's a CCS layer as well. So we're trying to look at how three funding models can value add, rather than cancelling each other out (Stakeholder 6).

The issue here for the service providers is that all the funding streams are a poor fit for the community's needs – which extend beyond pre-school hours and the traditional remit of childcare and pre-school. There are multiple funding streams available but all are narrow and inflexible in scope which creates a tension for First Nations services as most communities have broader objectives to support whole communities. Referring to the most recent changes under the 2018 Child Care Package, one stakeholder stated:

> Aboriginal services are not just trying to provide childcare for kids, they are trying to empower a community, trying to provide cultural safety for children, and CCS [Child Care Subsidy] doesn't recognize that. So I think those services are really really struggling, so no I haven't seen anyone thrive under the new model (Stakeholder 8).

Stakeholders identified the benefits of place-based funding, opposed to multiple federal and state/Territory program funding. One research participant emphasized the importance of place-based funding where communities could define their own needs and noted the precedent established by the Communities for Children model (Katz et al., 2010) which delivers a package of services and programs across portfolios (education, health, and child protection) determined at a local area level in 52 disadvantaged communities. She commented:

> There is no reason that the government couldn't fund nation by nation for First Nations people, like they've got the model there but they need to value and respect the differences between nations which is critical in policy, and you can't have Aboriginal people from different nations representing other nations at a senior government policy level which is what we do at the moment as a country (Stakeholder 4).

Overall, stakeholders talked about the complexities, limitations and lack of calibration of current funding streams and initiatives – both for families and service providers. Stakeholders recognized there is a need for 'parallel' streams where targeted funding accompanies universal funding (Stakeholder 5). Many wanted to be included in the universal system so children in remote communities could receive the same quality early childhood education as other children but emphasized the need for targeted flexible funding for the additional family and

community services necessary for this aspiration to be achieved. As one stakeholder explained an inclusive universal system would overturn the

> endles[sic] picking out groups as the neediest or most disadvantaged, it's just simply not the way to go […] because it leaves so many groups vulnerable to not being seen, not being viewed. But [also] because it carries within it a whole weight of, I guess, discrimination and treating people as other (Stakeholder 1).

Similarly, another stakeholder stated:

> [With] a new federal government in and a bit of a commitment to reform, to actually undertake a more substantial process around funding model reform. […] I think we've put pretty clear positions that tinkering with the kind of individual subsidy-based model isn't going to solve the problems for service delivery, especially in remote communities and especially for, for highly vulnerable populations (Stakeholder 5).

Three stakeholders explicitly talked about the need to unravel what exactly 'universality' means and looks like in policy. For example, as two stakeholders explained:

> it would be wonderful to have fleshed out an ideal of universality for remote communities […] And I think that if the commitment [to universal access] is genuine, then what governments and all the other organizations are going to have to do is really is really deep consultation with communities and their leaders as to what that that should mean in their contexts (Stakeholder 1).

> I think definitely universal access, what does that mean, what does it look like in different environments. And understanding that universal access will look different for different children, so having universal access to what a child needs. So I think there's a lot that needs to be unpicked there (Stakeholder 8).

Thus, stakeholders tended to agree that 'universal' delivery will manifest differently across communities because a responsive, inclusive universal system requires a commitment to community-led design and delivery. They noted the poverty of policy language in the mainstream system and suggested change to key terms like 'childcare' and even 'work.'

As will be discussed further in the next sections, language needs to reflect people's worldviews and everyday realities in order to realize the concept of universality in these communities. For example, one stakeholder commented,

> The childcare model itself, the language around it, in remote communities, has to change. It cannot be a 'well you drop your child here and go to work', because that's not happening in [most] remote communities […] the parent needs to be involved in the model, they need to be growing with the child. Because nothing is going to change if it's a bunch of [western] educators and a coordinator bringing up children. Community change is what's needed…so parents and elders have to be involved in that (Stakeholder 7).

It is also important to note that out of scope services may rely on a mix of philanthropic money, small government grants, and royalties and other community income streams. Further many remote communities are comprised of more than one community group, which can create challenges for investing income that comes to some but not all families, and for inclusive community representation in leadership and workforce development. This intra-community diversity can create an additional layer of funding and governance complexity which is not fully explored in this paper.

Stakeholders had diverse perspectives about the role and potential of philanthropy and how it shapes the sector. Some were uncertain about the role of philanthropy within the current market model of ECEC and what this means for universal entitlements. However, they recognized the value of the initiatives funded by these organizations in relation to broader sector development. They noted this funding allowed innovation, new practices to be trialed, programs to be built from the ground up and could resource advocacy (Stakeholders 2, 8). They recognized that philanthropically funded initiatives create a challenge because systems are not in place to monitor and measure outcomes from the various programs and initiatives funded by philanthropic organizations. (Stakeholder 6). A stakeholder from a community-led organization funded through a philanthropic foundation agreed with this general view, stating:

> we're still doing a million little data reports for a lot of different funders. But, you know, it is that collective investment that enables us to deliver and report to government with the flexibility from the philanthropy (Stakeholder 4).

Stakeholders also identified the positive role philanthropic organizations could play in building a strong evidence base, which will be discussed further in the Discussion.

4.2. Prioritizing community-led delivery and alignment with local knowledge

Aboriginal-led service delivery is increasingly recognised as a central pillar for effective service delivery in Aboriginal communities (SNAICC, 2015; Department of Social Services, 2021; Early Childhood Australia, 2022), 'guided by Indigenous ways of knowing' that prioritizes culture, and the role of family and kin in pedagogy (Harrison et al., 2017, p. 191). Stakeholders offered examples of how policy systems, service design and delivery should be community led and these typically aligned with the published examples of promising practices (SNAICC, 2015). They emphasized the need for better recognition of, and creative ways to foster, cultural knowledge and skills of the local workforce, which is discussed further in the next section.

There was consensus about the important role of community members in designing and delivering services. One stakeholder believed that one way to address this challenge would be to have stronger leadership from local women elders, who were often not represented in community leadership structures and organizations.

> If there was a strong women's group then the coordinator would be taking direction from them, and there would be more opportunity for sustainability (Stakeholder 7).

Stakeholders often talked about community-led delivery in relation to broader concepts of quality and culture, including how and why regulations should be adapted to community circumstances and needs. They believed in the value of ensuring community leaders have their say about "what children need," stating:

> I think we need to open up space to allow communities to have some real say about modifications and adaptations […] I think it has to be, it has to be a much more considered and thoughtful and joint collaboration, I think, between regulatory agencies, leaders and families to figure that out. But we all know that the workforce challenges across Australia are so acute. There's no way we are going to be meeting all of those requirements anytime soon in very remote areas (Stakeholder 1).

This prioritization of community-led policy extended to community-led delivery at the service level. One stakeholder felt strongly the local female elders, in particular, should be more involved, providing direction to service coordinators. With ongoing turnover of non-Indigenous staff in remote communities, the stakeholder believed this model would improve the sustainability of services (Stakeholder 7).

> And [community name] is really interesting because the families don't like sending their children to childcare, they see that as shame. Because why should someone else have to look after their children? But they'd come to Families and First Teachers program because they're part of one family. So what we find is the ladies who work in childcare, it's actually the family that enroll in the creche. You won't find people coming to enroll who aren't related to the ladies (Stakeholder 7).

One stakeholder argued that a First Nations education system could be "generic enough to be planned, developed and reflected nation by nation" and could sit alongside a mainstream education system (Stakeholder 4). Many early childhood services in the NT have funding for designated First Nations positions. However, community members are often paid as support workers rather than educators. This remunerates local Indigenous knowledge holders less than those who hold western teacher credentials. One stakeholder argued First Nations staff need to be equally remunerated and valued to address the hierarchy of knowledge between Indigenous and western knowledge and workforce sustainability. They explained that, in the early years, the

> emphasis on cultural knowledge is as important and remunerated as much as western knowledge and if not more so sometimes, particularly for the little ones the cultural knowledge and learning in language is the most important - and then when they start to get that 3, 4, 5 age you really start to bring in more extensive western learning (Stakeholder 4).

Many stakeholders emphasized the importance of an ECEC that delivers two ways of knowing – traditionally oriented local knowledge including knowledge accrued by Aboriginal people post-colonization and western/global knowledge. Pedagogical leadership by community elders means that children (and potentially local

workers) can receive the right knowledge at the right time. One stakeholder stated:

> So we are not expecting non-Aboriginal teachers to read books about Aboriginal culture and teach the kids' language and culture, we would never expect that. But we need to have, you know, Aboriginal kids need to have access to their language and culture and all of that in their education settings and recognize that (Stakeholder 4).

However, stakeholders emphasized that while they intended to work with traditionally oriented and western knowledges, there is a power imbalance between the two that requires vigilance (and the critical knowledges accrued by Indigenous people post colonization). One stakeholder from this First Nations organization explained their approach to early childhood delivery includes a combination of western trained and cultural expertise. This blend of knowledge structures everyday practice:

> [it's] at least two days a week it's learning on country which is fully in first language on country led by the cultural educators, and our western educators are there but they're in the background. And then we have the remaining days are generally at a center […] And that is where you - it's still in language but it's also in English, but it's also where you're learning your English, your literacy, numeracy, all of those kinds of things that Aboriginal kids need to become global citizens […] (Stakeholder 4).

In the long run, this service aspires to having all "First Nations people delivering those services, so even your western education should be in time delivered by an Aboriginal person" (Stakeholder 4). The aspirations and ideals advocated by many stakeholders were often followed with caveats about the structural barriers to achieving Aboriginal-led service delivery, discussed further below.

4.3. Promoting quality through investment in, and valuation of, local workforce

Most out-of-scope services (funded through the CCCF-R program or by independent funding streams) are not currently required to meet the National Quality Standards because of challenges in upskilling the workforce so they have recognized credentials. Stakeholders regularly asserted that cultural knowledges should be prioritized over Western pedagogies and qualifications. One stakeholder said credentials

> need to recognize how important cultural relationships and knowledge are in engaging families and supporting families in the local community and that those things are not recognized in qualifications or in in quality standards (Stakeholder 5).

Some suggested that policy could better recognize the skills and knowledge of local staff, rather than hold a myopic focus on their attainment of formal qualifications:

> So it's not about the qualification, it's about the gap that needs to be closed for educators who are great educators and operators, and

great connections to families and community but it's that formal qualification or literacy levels that need to be considered first [...] I think there's more benefit in figuring out how educators can show competencies in the context of how they're working, the practice is where it counts (Stakeholder 6).

However, there was recognition that it was important for local educators to be able to access training that involved western knowledges.

Ideally, we would like to see people supported so that there can be people with the qualifications able to take up these roles (Stakeholder 5).

There was broad consensus that there are significant barriers facing local community members wanting to gain this training and credentials. The logistics of undertaking Certificate IIIs were not well supported by policy. One stakeholder indicated "the RTOs that administer the Certificate IIIs aren't ready to do the remote work" (Stakeholder 7). Furthermore, they noted, "I just do not think any thought has been put into how that [requirement for credentials] is going to impact the community" (Stakeholder 7).

Recruiting and retaining Aboriginal and Torres Strait Islander educators and staff members in remote communities was identified as a significant part of the policy problem, but also the policy solution. One stakeholder identified partnerships between communities and training institutes as "potentially valuable areas to build on" (Stakeholder 5). Others noted that productive partnerships between RTOs and certain communities existed previously, but that "funding does not allow for it anymore. So that makes it quite difficult for staff to access training that is truly accessible. Because online is not an option when it's in English and that's your fourth language" (Stakeholder 6). They identified other successful local initiatives, including services partnering with local schools offering VET courses to Year 10 and 11 students. Another service organized their daily program to allow educators paid time to complete their studies:

In [community] we've got one Western coordinator, one Western educator and 3 [local] educators. But the reason we could do that is that [community] only operates until midday, and we paid them to stay on to complete their certificates (Stakeholder 7).

Cultural activities and family obligation were commonly identified as a key challenge to recruiting and retaining First Nations staff. One stakeholder explained that out-of-scope services have the capacity to be respectful of the customary activities and obligations of Aboriginal people and respond to the needs of both families and local staff:

We recognize they won't be around so then they go off and do that [sorry business]. But that can't happen in mainstream systems because there is no flexibility [...] And so for people with that level of work experience we have extremely supportive systems and variable contracts and you work when you can, where you can and all that kind of stuff, and we respect the kinship systems (Stakeholder 4).

It was recognized by more than one stakeholder that this requires a lot of resources to cover periods when staff are away, however this model was viewed as a good investment because these staff are reinvigorated with traditional knowledge and remain loyal and committed to the organization (Stakeholders 4, 7).

Stakeholders identified the challenges of attracting local women to work in the childcare and the need to prioritize cultural knowledges in the everyday running of services:

There needs to be a way to really motivate the women to do their study. If we're not running the childcare in a way that the community believes we should raise children then nobody is going to be interested in studying a Western model. I just don't think enough work has gone into it [developing a culturally safe model]. I don't think they've asked the right questions (Stakeholder 7).

In addition to these service and program level initiatives, another example that is designed to build capacity and retention among staff is SNAICC's THRYVE program, which is intended to "support the capacity of First Nations early childhood services to deliver quality early education and development supports" (p. 4). One stakeholder commented on how, through the initiative, "small teams in particular states and territories to be able to work with the Aboriginal early years services to support them around workforce development and policy and program development and providing [*sic*] that kind of intermediary or backbone support that we have been calling it (Stakeholder 5). This pilot program is operating in urban, regional and remote locations across New South Wales, Victoria and Western Australia to support and represent First Nations community-controlled early years services, and responds to the need to build capacity and among Aboriginal-controlled services and support local solutions.

5. Discussion

The three themes discussed above point to considerable consensus among a diverse group of stakeholders about the current limitations of the market model. The findings demonstrated that the market-model for ECEC and multiple, and changing, funding streams create financial uncertainty and instability in many remote communities. Stakeholders offered different views about the effectiveness of targeted funding streams. Although there was a consensus that services should be accessible to all, stakeholders explicated that universality looks different across communities and noted the need for a clear definition of universality and more thought about how a universal set of principles can align with the values in remote communities and their need for service differentiation. These findings align with other research with remote First Nations communities in relation to the need to recognize alternative approaches to early learning and care for children (Fasoli and Moss, 2007; Harrison et al., 2017).

Stakeholders articulated the need to shift to supply-side funding, but in a way that recognizes and prioritizes diverse community needs. Supply-side funding is more effective in achieving uniform quality, and a "higher degree of equity and access and participation than consumer subsidy models" (OECD, 2006 in Brennan, 2013, p. 21). Targeted approaches risk the development of a multi-track service system, which embeds different quality services for children depending on their income-level and targeted inclusion/exclusion in the national system. This type of fragmented system has the potential

to embed structural disadvantage in the early years with long-term social and economic consequences (Gambaro et al., 2014). Only a universal system has the best chance of providing sustained high-quality services for all children across the income-spectrum (Penn, 2009; Watson, 2012). Overall, the findings show that deeper consultation about community priorities is required if the ECEC system is to meet children's needs universally.

Themes about community-led delivery intersect with discussions about the qualities that should underpin practice. There was strong consensus that high quality practice relies on community elders guiding all aspects of practice (from determining the nature of services that need to be available, to communication with families, setting up learning environments, pedagogical interactions with children). This will ensure practice is embedded in cultural knowledges specific to and sustaining for the community. In this way, the findings about community-led delivery, quality and local workforce challenges and solutions are intertwined. These findings very much align with previous research about community-led delivery and pedagogical practice that have been undertaken in the Northern Territory (Fasoli and Moss, 2007; Armstrong et al., 2022). Stakeholders identified the importance of Aboriginal-owned organizations to have representation from across their communities, touching on gender, age and different family groups as cohorts that were sometimes underrepresented. In particular, stakeholders emphasized the need for local elder women to be more involved with the design and delivery of ECEC services so as to better reflect the cultural knowledges and practices of their communities. This aligns with good practice case studies of First Nations early childhood services (SNAICC, 2019a). It is important their own skills and knowledge about child rearing and education underpin the everyday practices of services, and their role is recognized and supported within the broader regulatory and qualification frameworks.

As with the sector more broadly, there are critical structural barriers to building up the local workforce. This included the structure and format of Certificate III, including language and online access; and requirements to undertake placements in different communities. These barriers are recognized in the National Children's Education and Care Workforce Strategy (Australian Education and Care Quality Authority, 2021). Importantly, there are also cultural barriers whereby stakeholders identified local women (primarily) are not encouraged to enter the sector because the purpose and practices of mainstream ECEC often do not resonate with their own cultural beliefs about childrearing and education. Stakeholders offered solutions to this, including dual systems that prioritize both Western and First Nations pedagogy and knowledge, akin to identified approaches operated by non-government organizations in the Northern Territory and across other communities in Australia (Barhava-Monteith, 2020; Children's Ground, 2020). These findings touch on some of the key themes from another study undertaken by the authors, particularly around the need to privilege local knowledge and skills outside existing quality frameworks (Skattebol et al., 2023) through better recognition and valuation of cultural practices and worldviews. Importantly there are existing ECEC frameworks and approaches that regard local knowledges as central for children's wellbeing and belonging as well as a rich foundation for learning western/global knowledge and skills. Australia has a strong heritage in two ways (both ways) education (Ober and Bat, 2007) and marginalized people in other countries have

utilized the funds of knowledge concept (González et al., 2006) to galvanize children's existing everyday knowledge the with western/global knowledge which brings power in the wider society.

One of the aims of the study was to generate a better understanding about the research gaps and priorities in relation to ECEC policy in remote communities. Stakeholders agreed that research and evaluation is critical to inform evidence-based approaches and advocate for policy reform. However, some stakeholders were also critical about how the gaps should be addressed:

> "In early childhood there's no lack of knowing what the problems are, there's a lack of evidence about the causal links" (Stakeholder 8).

The stakeholders in the study were from diverse organizations and backgrounds, including First Nations and non-First Nations participants, offering national and jurisdictional-level perspectives. The common gaps that were prioritized by stakeholders centered on workforce issues (Stakeholders 1, 2), community-controlled approaches (Stakeholder 5) and the need for Aboriginal-led research (Stakeholder 4). It is integral that communities are involved not only in research about the everyday practice and pedagogy to support children's development (Lowell et al., 2018; Armstrong et al., 2022), but also in research about how these practices can inform the design of policy and research to monitor how these programs are working (Children's Ground, 2020).

Children's Ground model for long-term evaluation offers an approach to embedding First Nations worldviews and approaches into rigorous data collection and monitoring, and which views outcomes holistically. It tackles issues integral to undertaking high quality research with and about First Nations communities, including research integrity, data sovereignty and the involvement of First Nations researchers in data collection and evaluation (Children's Ground, 2020).

6. Conclusion

The paper outlines many of the complexities and nuances of ECEC service delivery in remote communities. It also identifies challenges and tensions at the nexus of research and policy change. It is designed to prompt discussion about current initiatives, challenges, and future possibilities for ECEC in remote communities and, ultimately, it is intended to foster dialogue among policy makers, service providers and researchers in the ECEC policy field.

It is important for us, as non-Indigenous researchers, to acknowledge the limitations of our findings, while also recognizing and valuing how new data and perspectives can contribute to change. We advocate for further research in this area to be led by First Nations researchers and communities. However, given the study's focus on policy stakeholders, all who held a position of privilege within their organizations (both First Nations and non-First Nations), the findings from this pilot study offer new insights into current policy developments and build on recent sector momentum to expand and improve outcomes for children living in remote communities, particularly First Nations children. There is potential to continue to invest in collaborative projects that involve governments, Indigenous-owned organizations and ECEC

providers to improve outcomes of First Nations children and families. The Early Childhood Care and Development Policy Partnership is an example of a new initiative that aims to address the identified need for sector partnerships. It is important these types of initiatives are monitored and evaluated so that successful elements of these programs can be retained and expanded to new locations, and even difference service sectors.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The study was reviewed and approved by UNSW Sydney HREC and the NT Health and Menzies School of Health Research Human Research Ethics Committee (NT HREC). The participants provided their written informed consent to participate in the study.

Author contributions

EA developed the research questions, undertook the qualitative research for the study, analyzed the data, and drafted the findings. JS

supported the analysis and interpretation of findings, and contributed equally to writing of the article. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Defining early education quality using CLASS-observed teacher-student interaction

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In this paper we argue that the quality of early education programs or classrooms can be defined in terms of features of teachers' interactions with students observed using the Classroom Assessment Scoring System, or CLASS. We present evidence suggesting that dimensions of teacher-student interactions can be described, observed, and measured consistently across cultures and countries and that such dimensions also have modestly positive influence student development and learning. Evidence is summarized indicating that interactions can also be improved systematically through professional development interventions. The paper relies on a framework that describes core features of effective teacher-student interactions present across countries' highly varied settings and cultural contexts. Limitations of the study include exclusive reliance on the CLASS and that most countries were not low or middle income. We discuss the cross-cultural applicability of the framework and outline suggestions for education policy and practice and future directions for research.

KEYWORDS
teacher-student interactions, early childhood quality, early education policy, preschool quality, teacher effectiveness

Introduction

Large-scale studies of educational "inputs" intended to promote student learning (e.g., funding, class size, teacher qualifications) reinforce the inference that students' experiences in classrooms are the primary agent of their progress (e.g., Nye et al., 2004; Reardon et al., 2013), including in programs serving preschool-age children (Mashburn et al., 2008). This finding is not limited to studies of United States samples but has been reported in preschool and elementary grades from countries across the globe, as varied as Chile, China, and Finland (e.g., Yoshikawa et al., 2015; Virtanen et al., 2018; Hu et al., 2020), in some of which preschool programming tends to be more formalized (UNESCO, 2015; UNICEF, 2019). In efforts to better understand and improve the processes within classrooms for young children that are responsible for these results, teachers' interactions with students are among the most well-studied and promising elements from among other aspects of classroom experience, including aspects of the physical environment, structural features (e.g., class size), or programmatic elements such as curricula (Mashburn et al., 2008; Fuller et al., 2017). In this paper we discuss findings from studies using the CLASS (Pianta et al., 2008) assessment of teacher-student interaction in United States and non-United States preschool classrooms that suggest defining early education quality in terms of observable features of teacher-student interaction.

Our and others' research (see Morrison and Connor, 2002; Pianta et al., 2007; Kane et al., 2014; Vernon-Feagans et al., 2019) has generated a set of findings about teacher-student interactions that have implications for approaches to defining, measuring, and improving the impact of early education systems. Although these findings are based largely on data collected

from United States and Western European classrooms, recent work in Latin America (e.g., Carneiro et al., 2019) are not inconsistent with these results. The general conclusions are that: (1) teachers are the most potent asset that the education system provides to foster student learning and development (Sabol et al., 2013); (2) qualities of teacher-student interactions that support student engagement and effort, knowledge and thinking, problem-solving and communication skills, and positive relationships with others are the source of these teacher effects (Carneiro et al., 2019; Vernon-Feagans, et al., 2019); (3) these qualities of teachers' interactions can be observed and measured, and predict multiple aspects of student development (Morrison and Connor, 2002; Vernon-Feagans, et al., 2019); (4) effective interactions can be learned and improved (Hemmeter et al., 2015; Piasta et al., 2015); and (5) supporting effective teacher-student interactions at scale requires workforce development systems that integrate measurement and improvement support (Pianta et al., 2020a).

These conclusions also align with experience accumulated from the implementation of tools to assess and improve teacher-student interactions over the past decade, through which practitioners and policymakers alike describe the capacity created to support student learning when teachers and their interactions with students are made explicit as a developmental and educational resource (Pianta and Allen, 2008; Lemov, 2010; Hemmeter et al., 2015). Importantly, although the evidence for interactions as a key component of effective early education, we acknowledge that contemporary analysis of studies in which multiple aspects of programming are examined, including for example the rigor of instruction or dosage of exposure to content, there is also evidence that these features independently and interactively combine to support children's learning (Pianta et al., 2020a; Nguyen et al., under review).[1]

A focus on "quality" has been a hallmark of early education policy, programming, and research for over three decades (for example, see McCartney et al., 2007). This focus has persisted as expanded access to quality early education and care features prominently in educational and social policy and human capital improvement in low- and middle-income countries as well (UNESCO, 2015; UNICEF, 2019). Over the years, definitions (and measurements) of quality in early care and education have focused on (1) structural elements of programs such as ratios, length of day, staff qualifications, etc.; (2) physical features of the classroom environment and practices related to safety and health; (3) observed aspects of teacher-student interaction that children experience directly; and (4) indices that aggregate across different indicators, such as Quality Rating and Improvement Systems (QRIS). Assessments of quality can focus on any one or combinations of these wide-ranging elements including: the duration of the school day, teachers' educational levels, and child-teacher ratio; cleanliness and materials, the daily schedule, or how the setting is arranged; or teachers' behavior, language, and emotional warmth in the classroom. This cornucopia of constructs and associated measures have rendered the term "quality" challenging to interpret or to adopt as a focus of investment or improvement.

We address the multiple operationalizations of the term quality in two ways. First, we assume that "quality" refers to those features of an educational opportunity that contribute to student learning and

development, and that vary across individuals' educational experience. Efforts to identify and ensure exposure to those features are essential to building an effective system. Notably, regulable factors such as ratio, size, length of day, teacher qualifications, or practices related to safety and health as elements of program design and infrastructure which by policy, are intended to be constant across all programs, classrooms, and enrolled children. As features of design, these are valuable as foundations that assure a set of minimal thresholds for programs (McCartney et al., 2007), some of which, such as ratios or length of day, may foster children's learning (NICHD ECCRN, 2005). However, we apply the term quality to those elements of program experience that more directly contribute to student learning and that vary considerably; this application of the term quality refers to the ways that regulable factors are implemented. This framing for the use of the term quality, sometimes referred to as "process quality" (National Institute of Child Health and Human Development Early Child Care Research Network, 2005) calls attention to variation in children's experiences despite consistency in structural indicators. Assessment of such features is most often accomplished through use of different methods of direct observation or teacher/caregiver report.

In this paper we draw from a large data set of observations of classrooms across numerous non-United States countries that used the Classroom Assessment Scoring System (CLASS; Pianta et al., 2008) to extend research from United States samples that describe patterns and features of teacher-student interaction that have common value for student learning and development. The published research from which we draw (see Hofkens et al., in press) includes data collected in countries as varied as Sweden (Castro et al., 2017), rural Ecuador (Carneiro et al., 2019), and China (Hu et al., 2020) to study the nature, quality, and impact of teacher-student interaction across cultures. The use of a common observational measure across countries also affords the opportunity to examine cross-country similarities in teacher-student interactions. Admittedly, the advantage of a common measure for examining quality across contexts is mitigated by the lack of alternative measures of contrasting definitions (e.g., structural features, aspects of the physical setting). As noted above, teacher-student interaction could be assessed through varying forms of direct observation (ratings, frequency counts) or reports by teachers or program leaders, thus the paper is not only limited by framing quality in terms of classroom processes, it is also limited by using only one method to measure those processes.

We agree with the framing for this collection of papers that quality is a multi-faceted term that may have different referent points for varying stakeholders (e.g., parents, educators, community members, students). It is also relevant to note that efforts to build and expand systems of early education and care in low- and middle-income countries globally may find identifying the key regulable foundational features of programs as important as aspects of process quality that are the focus of this paper. In this multi-faceted context we suggest one perspective for defining quality is that of a trained observer focused on teachers' classroom interactions with students.

United States studies on quality as defined through observed teacher-student interaction

As noted earlier the term "quality" is often used in very general and abstract ways. Although it has a certain appeal by implying there are ingredients of early education opportunities that yield positive

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[1] Nguyen, T., Pianta, R. C., Whittaker, J. V., Vitiello, V. E., and Ruzek, E. A. (under review). Associations between classroom processes and students' academic outcomes from pre-kindergarten through first grade. *Elem. Sch. J.*

impacts on children; the term "quality" invites wide-ranging interpretations, which can impede efforts to systematically study and improve programs and their support for children, at scale. If, as we conceptualize, the term "quality," should reflect a direct link between an educational opportunity and its intended outcomes (Pianta et al., 2020a), then at least one component of defining quality should be students' direct experiences with teachers who engage them in educationally and developmentally salient learning activities.

As just one illustration of this point, we describe results from two studies that each contrasted the predictive strength of differing operationalizations of quality in the United States (Mashburn et al., 2008; Sabol et al., 2013). Many US states use multi-component assessments of several features of early education programs (often structural) as indicators that are then aggregated into a single composite marker of quality (i.e., Quality Rating and Improvement Systems). These reflect the multi-faceted nature of quality. Studies of these composites suggest that they may obscure or omit aspects of the program predictive of students' learning and development. For example, in one multi-state evaluation of the indicators included in Quality Rating and Improvement System composites (Sabol et al., 2013), observations of the classroom environment, and particularly of teacher-child interactions, were the only indicators that demonstrated significant relations with children's school readiness. In other studies comparing the predictive value of quality measures – including observations of teacher-student interactions, observations of multiple features of the classroom environment, and a composite quality indicator developed by the National Institute for Early Education Research (NIERR) – higher ratings of teachers' observed instructional interactions predicted gains in academic readiness and language while greater evidence of teachers' emotional support was related to lower levels of problem behavior (Mashburn et al., 2008). Across multiple studies, when observations of teachers' classroom interactions with children are included in models predicting student learning and development that also include other hypothesized indicators of quality (whether aggregated composites or single indicators such as teacher education, class size, etc.), assessments of observed interaction routinely yield significant associations with student outcomes. In yet another example, Ansari and Pianta (2018) used data from the NICHD Study of Early Child Care and Youth Development to examine whether the quality of early education (birth to 54 months) was predictive of children's learning and development outcomes through 5th grade. A measure of quality was formed from a rating of observed teacher/provider-child interaction in analyses that also included teacher-child ratio, caregiver training and attitudes, etc. Among all indicators of the childcare or preschool structure or experience, observed quality of teacher-student interaction accounted for the greatest variance in students' later performance.

Conceptual frameworks for quality and teacher-student interactions

The studies just described provide empirical support for defining quality in terms of observable features of teachers' classroom interactions. In the sections that follow, we present more detailed discussion and evidence related to one observational assessment of teacher-student interactions, the CLASS, drawing from work in United States and international samples. It should be emphasized that in the context of international studies of early education and care

programs, the Early Childhood Environment Rating Scale (ECERS) and its versions for younger children and more recent revisions, have been used much more widely than CLASS (e.g., Vermeer et al., 2016; Betancur et al., 2021) and recently the Measuring Early Learning Environment Scale has shown promise in observations conducted in sub-Saharan Africa (Raikes et al., 2020). In the recent work by Betancur et al. (2021) and Vermeer et al. (2016) analyses revealed teacher-student interactions to be one of only three factors (a more limited set than described in the manual) and, as is typical in observation studies, associations with child outcomes were modest.

A thorough description of theory motivating the CLASS as an indicator for quality is provided in Hamre et al. (2013) presentation of the Teaching Through Interactions (TTI) framework. The TTI framework draws heavily from earlier theoretical and empirical work (e.g., Brophy, 1999; Eccles and Roeser, 2011) and describes a theory for defining, describing, and measuring teachers' classroom interactions, as operationalized in the CLASS observational tool. The TTI framework organizes teacher-student interactions around three broad domains of teachers' support for student development – Emotional Supports, Classroom Organization, and Instructional Supports (Hamre et al., 2013; see Table 1). These are based on their presumptive salience for student development in the areas of social and emotional development, self-regulation and attention, and achievement, respectively. Within each of these three broad domains, the TTI specifies a set of dimensions of interaction (e.g., Teacher Sensitivity, Effective Behavior Management, Quality of Feedback) that provides detailed behavioral markers and descriptions of indicators of each dimension as they may appear at low, medium, and high levels. A body of work on teacher-child interactions draws from the TTI framework and the CLASS observational measure (Pianta et al., 2008).

Research using the CLASS in United States early education and care settings provides both evidence supporting the three hypothesized domains of interactions in the TTI framework as a theoretically and empirically sound approach to describing and measuring the quality of teacher-student interactions in classroom settings (Hamre et al., 2013), although other studies have pointed to a single overall quality of interactions factor as the most parsimonious descriptor (Pianta et al., 2020a). Results from a study of CLASS observational data from over 4,000 preschools to fifth grade United States classrooms (Hamre et al., 2013) supported the three-domain structure. Analysis of CLASS-based observations in upper elementary and secondary grades from the Measures of Effective Teaching sample of more than 3,000 classrooms (Kane et al., 2014), also affirmed these three broad areas as potentially useful descriptors of teachers' practices.

In the early education and care sector, studies have also converged on a general picture of the quality of interactions with teachers experienced by the typical preschooler in the United States. Using the CLASS and other observational tools, numerous studies report that quality of teacher-student interaction varies markedly, ranging from sensitive and stimulating, to dismissive and harsh. In the National Center for Early Development and Learning's study of state prekindergarten programs, only 15 percent of classrooms demonstrated high-quality interactions across 2 of the 3 CLASS domains, whereas 19 percent of classrooms scored well below the mean on emotional, organizational, and instructional supports (Pianta et al., 2005). In general, although the average level of teachers' emotionally supportive interactions is moderately positive and warm, the picture revealed by observations in thousands of childcare and

TABLE 1 CLASS framework for early childhood classroom quality.

Area	Dimension	Description
Emotional Support	Positive Climate	Reflects the overall emotional tone of the classroom and the connection between teachers and students
	Negative Climate	Reflects overall level of expressed negativity in the classroom between teachers and students (e.g., anger, aggression, irritability)
	Teacher Sensitivity	Encompasses teachers' responsivity to students' needs and awareness of students' level of academic and emotional functioning
	Regard for Student Perspectives	The degree to which the teacher's interactions with students and classroom activities place an emphasis on students' interests, motivations, and points of view, rather than being very teacher-driven
Classroom Management	Behavior Management	Encompasses teachers' ability to use effective methods to prevent and redirect misbehavior, by presenting clear behavioral expectations and minimizing time spent on behavioral issues
	Productivity	Considers how well teachers manage instructional time and routines so that students have the maximum number of opportunity to learn
	Instructional Learning Formats	The degree to which teachers maximize students' engagement and ability to learn by providing interesting activities, instruction, centers, and materials
	Classroom Chaos	The degree to which teachers ineffectively manage children in the classroom so that disruption and chaos predominate
	Classroom Management	The degree to which teachers provide clear instructions, rules, and routines that children clearly know and understand, as well as well-timed proactive behavioral strategies rather than control techniques
	Child Responsibility	The extent to which teachers provide children with the opportunity to take on roles and operate autonomously in the classroom
Instructional Support	Concept Development	The degree to which instructional discussions and activities promote students' higher order thinking skills versus focus on rote and fact-based learning
	Quality of Feedback	Considers teachers' provision of feedback focused on expanding learning and understanding (formative evaluation), not correctness or the end product (summative evaluation)
	Language Modeling	The quality and amount of teachers' use of language-stimulation and language-facilitation techniques during individual, small-group, and large-group interactions with children
	Instructional Conversation	Considers the extent to which teachers' verbal interactions with children are reciprocal and focus on the facilitation of reasoning, concept development, expression of ideas, and cognitive elaboration
	Literacy Instruction	The extent to which teachers reads to children, provides explicit phonics instruction, elaborates on books with comprehension and process questions, and exposes children to written language
	Richness of Instructional Methods	The extent to which teacher use a variety of strategies to promote children's thinking and understanding of material at deeper and more complex level

early childhood classroom settings suggests relatively positive socioemotional and organizational supports, and notably low levels of teachers engaging in stimulating, conceptual conversations or providing rich feedback on students' learning; for the most part, "teaching" in these settings is highly focused on rote learning of discrete and decontextualized knowledge. Children from low-income families and historically marginalized groups are more likely to experience fewer effective interactions in early childhood programs than their non-poor or privileged peers (Kuhfeld et al., 2019); these findings are not dissimilar to those using other observational protocols in early education settings.

Teacher-student interactions and student outcomes

Teacher-student interactions are a central element of classroom processes related to children's learning (Ansari and Pianta, 2018; Vernon-Feagans et al., 2019; Vitiello et al., 2020), whether observed using CLASS, ECERS or other observational systems (e.g., Hemmeter

et al., 2015). Learning gains appear to be modestly greater when teachers emphasize conceptual understanding, provide feedback that extends students' skills, and engage children in conversations (National Institute of Child Health and Human Development Early Child Care Research Network, 2005; Burchinal et al., 2010). Similarly, children whose teachers create an organized and emotionally supportive classroom demonstrate improvements in self-regulatory and social-behavioral outcomes; in fact, children who display problems in self-regulation appear to benefit even more from exposure to effective teacher-child interactions (Hamre and Pianta, 2005; McCartney et al., 2007; Vernon-Feagans et al., 2019). Multiple years of exposure to effective teacher-student interactions appears to be of additional benefit (Cash et al., 2018; Vernon-Feagans et al., 2019), although it is not the norm (Pianta et al., 2007).

Effect sizes obtained between observed features of teachers' interactive behaviors and student outcomes such as achievement test scores are small (Brock et al., 2008; Mashburn et al., 2008; Rimm-Kaufman et al., 2009; Burchinal et al., 2010; Pakarinen et al., 2011), with larger correlations for students with higher risk profiles (Hamre and Pianta, 2005; McCartney et al., 2007), or for associations with

students' motivation (Ferguson and Hirsch, 2014). Specifically, in United States studies, children who come from low-income families, who are dual language learners, or who have problems with self-regulation appear to benefit more from effective teacher-student interactions than do their more-resourced peers (e.g., Hamre and Pianta, 2005; Desimone and Long, 2010; Ansari et al., 2020). Children reap the most academic benefit from effective teacher-student interactions when they are exposed to such interactions for several years (Cash et al., 2018; Vernon-Feagans et al., 2019).

Most published studies have used statistical controls to reduce or adjust for selection effects. Evidence from recent intervention studies and random assignment studies support a causal link. In experimental evaluations, when teachers improve their practices after they receive training and coaching on teacher-student interactions, the children in their classrooms benefit academically, socially, and behaviorally (Hemmeter et al., 2015; Pianta et al., 2021). Professional development interventions designed to improve teacher-student interaction demonstrate positive impacts of targeted professional development on both teacher-student interaction and student outcomes in preschool and early elementary grades (Boston Consulting Group, 2019; Pianta et al., 2020a). Other evidence for a causal link comes from studies that randomly assigned children to classrooms (Campos et al., 2021). One study conducted in Ecuadorian first- and second-grade classrooms, estimated that teachers in the top 25 percent in terms of the quality of their interactions produced the equivalent of almost 9 months more of achievement growth than did teachers in the bottom 25 percent (Campos et al., 2021).

Improving interactions and student outcomes through professional development

Tools for observing teachers' classroom interaction are also a focus for professional development (PD) that targets the interactions defined by those tools. Hemmeter et al. (2013) have used the *Teaching Pyramid Observation Tool* (TPOT; Fox et al., 2014) to guide coaching focused on teachers' support for children's social and emotional skills. The TPOT measures a set of practices that promote positive behavior among young children. Coaches implementing Practice-Based Coaching conduct TPOT observations to define targets for their work with teachers; their feedback leads to changes in teachers' practice (Hemmeter et al., 2013, 2015) and observed improvements in children's social skills. PD models designed to focus on improving teachers' interactions based on the CLASS (Pianta et al., 2008) include a college course and a video-based coaching model that have demonstrated positive impacts on teaching practice and, in several studies, on student outcomes (Pianta et al., 2008; Hamre et al., 2012; Pianta et al., 2021). Evaluations of MyTeachingPartner coaching showed that when teachers received MTP coaching, children made greater gains in receptive vocabulary, task orientation, and prosocial assertiveness (Pianta et al., 2021).

Summary of United States studies

The sections above present evidence from United States studies demonstrating that dimensions of teacher-student interactions can be described, observed, and measured consistently. Studies also

indicated that dimensions of teacher-student interaction positively influence student development and learning. Finally, evidence indicates that interactions can be improved systematically through PD interventions. This line of evidence suggests a logic such that interactions could reasonably be considered a focus for describing, defining, measuring, and improving quality in early education classrooms. Below we summarize results from a recent systematic review and meta-analysis drawing from observations of classrooms outside of the United States (Hofkens et al., in press) in an initial effort to examine the extent to which these conclusions from the United States literature may extend more broadly to using observed interactions between teachers and children as a defining feature of early education quality across other countries and cultures.

International studies on quality as defined through observed teacher–student interaction

Although much of the research using classroom observation (mostly CLASS or ECERS) has been conducted in United States preschool and elementary classrooms, recent work in a variety of international settings—including Central and South America, Europe, and Asia—has also documented that teacher-child interactions support development and learning (e.g., Yoshikawa et al., 2015; Vermeer et al., 2016; Virtanen et al., 2018; Hu et al., 2020; Betancur et al., 2021). Because of broadening focus on the quality of early education in non-United States countries (UNICEF, 2019) and the use of CLASS in studies of these countries' early education systems, we conducted a systematic review of the published literature reporting data on observed teacher-student interaction from non-United States samples (Hofkens et al., in press).

Hofkens et al. (in press) culled published empirical studies cited in search engines relevant in psychology and education (PsychInfo, ERIC, Google Scholar, Academic Search Complete, Education Research Complete, Education Full Text). They also included in the search databases for masters and dissertations (ProQuest and LIBRA Institutional Repository hosted out of the University of Virginia), websites of documents from large-scale studies that use the CLASS measure (RAND, Measures of Effective Teaching, the National Institute of Child Health and Human Development Study of Early Child Care and Youth Development, and the Early Childhood Longitudinal Study Head Start Impact Study), and the What Works Clearinghouse. Covidence software was used to remove duplicates. Remaining citations were systematically screened (double screened with discrepancies resolved through consensus) using the following criteria. Journal articles, reports, briefs, or theses were retained for further analysis if they reported CLASS data for which: 1) raters were trained using standard approaches and reliability data were included; 2) the sample included at least 20 lead or subject-specific teachers in 3) the classroom was preschool (defined as serving children ages 3–4) or kindergarten (a working definition of "early education"). Thus, reports were not considered further if they focused on infants/toddlers or childcare settings, summer or after school programs, included fewer than 20 teachers, did not include CLASS data, did not report reliabilities for trained observers, or did not present evidence that observers were trained. An author from each document was

contacted to request information about other documents that met inclusion criteria and included any new documents in the database. The full database included 365 documents from 133 studies, among which 52 documents were from 19 separate data collection efforts that used the CLASS outside of the United States (Hofkens et al., in press). Notably, most of the countries included in this meta-analysis could be considered middle income and had established policies and program infrastructure for early education.

The 19 studies reported observational data using CLASS in 2,186 separate prekindergarten and kindergarten classrooms (trained raters averaged 3.3 observed cycles over 1.6 days; see Table 2 reproduced from the original Hofkens and colleagues' paper [in press]). This data set, from the standpoint of stakeholders' perspectives on early education quality around the globe, enabled us to understand if: (1) raters (as stakeholders) could, after training, agree on a common set of quality features; (2) whether the pattern of those features was similar or different across countries/cultures; and (3) if studies reported them, the extent of associations between teacher-student interaction and children's learning and development. Below we extend the analysis of Hofkens and colleagues to further elaborate on the CLASS factor structure and its meaning for defining quality, as well as the implications of a common language and lens for quality based on observing interactions.

Observing and describing interactions with a common measure across countries

The overall inter-rater reliability across all studies and corresponding CLASS dimensions in Hofkens et al. (in press) paper (reported as intraclass correlations, percent agreement, or kappa scores) was reported as good to excellent (ranging from coefficients of 0.65–0.94), with the exception of one study of Portuguese preschools (Cadima et al., 2014) which had moderate inter-rater reliability (Ranganathan et al., 2017). Furthermore, the internal consistency of CLASS domains appeared consistent across different cultural contexts. More specifically, Hofkens et al. (in press) used reliability generalization as a meta-analytic technique to establish 95% confidence intervals (Rodriguez and Maeda, 2006) for each of the three CLASS domains for the studies in which internal consistency coefficients were reported. The respective confidence intervals for the three CLASS domains (Emotional Support, Instructional Support, Organizational Support) varied between 0.81–0.89; 0.87–0.94; and 0.78–0.87′ respectively, suggesting that the internal reliability for each domain was high across the international studies. These analyses of different indicators of reliability provide preliminary evidence that the TTI framework (as operationalized by CLASS) describes aspects of teacher-student interactions that are evident in classrooms across different cultural contexts.

More specifically, several studies outside the US directly evaluated the 3-domain framework organizing teacher-student interaction (Sandstrom, 2012; Cadima et al., 2014; Gamlem and Munthe, 2014; Besnard and Letarte, 2017; Castro et al., 2017; Gasser et al., 2018; Niklas and Tayler, 2018; Pöysä et al., 2019). These analyses of the factor structure of the CLASS suggest support for the 3-domain framework in early education classrooms across the globe, including prekindergarten samples in Chile (Yoshikawa et al., 2015 as cited in Leyva et al., 2015), Denmark (Slot et al., 2018), and Turkey (Ertürk Kara et al., 2017), and in kindergarten samples in Germany (Von

Suchodoletz et al., 2014), Vietnam (Hoang et al., 2018), and in China, where there was also support for a bi-factor model (Hu et al., 2020).

The Negative Climate dimension did not appear to be a significant component of the Emotional Support domain in several countries. In a systematic examination of the CLASS Pakarinen et al. (2010) found that quality of the Finnish kindergarten teachers in their samples was best represented when the Negative Climate dimension was omitted. Similarly, noting the poor discriminate validity of the Negative climate dimension in the previous study, Stuck et al. (2016) also omitted the dimension their study of 57 prekindergarten teachers in Germany. In another study of almost 180 prekindergarten teachers in Portugal, Cadima et al. (2018) found that when they omitted the Negative Climate dimension, the three-factor model provided the best relative fit to the data. It should be noted that contemporary guidance on the use of CLASS in research and in applied implementations suggests excluding Negative Climate from the domain-level computations.

Quality of teacher-student interaction across countries

Hofkens et al. (in press) reported the first multi-country non-United States view of CLASS-observed teacher-student interaction, albeit mostly relying on studies of European or developed countries. Overall, results across this somewhat narrow scope of international studies reflect the American research: mostly mid (4) to middle-high scores (5) for the Emotional Support and the Classroom Organization domains, and lower (2) to low-mid scores (3) for the Instructional Support domain (e.g., Harnes et al., 2014). In this limited international sample, the highest scores are reported in Classroom Organization, with multiple studies reporting a high score (mean level of almost or over 6), which is somewhat higher than in the United States, in which the highest scores are typically associated with the Emotional Support domain, at least in younger-grade samples. Not dissimilar to results from the United States, this multi-national analysis indicates the mean level of Instructional Support is 2.7 across the studies; several studies reported Instructional Support in the low range (1–2), with only a few reporting mid-range scores (3–5). This pattern of low levels on the CLASS Instructional Support domain is consistent with United States findings and suggests that most of the instruction in classrooms across an even broader set of countries focuses on learning discrete facts and skills through instruction that has a rote focus. Adjusting for the reliability among raters in each study (Wiernik and Dahlke, 2020), Hofkens et al. (in press) describe similar findings to those summarized above. The resulting picture of classrooms from this small sample of non-United States classrooms suggest they may be more highly structured, on average, than in the United States, however all samples depict a high degree of variability across classrooms.

Teacher-student interaction and student outcomes outside the United States

Although the nature and magnitude of the associations between teacher-child interactions and student outcomes varies across these studies, Hofkens et al. (in press) analysis suggests that young students' quality of interactions with teachers play a modest role in their developmental and academic success. For example, overall quality of

TABLE 2 Studies of international classrooms that measure teacher-student interactions with the Classroom Assessment Scoring System.[c]

Description						Overall CLASS score			Emotional support mean			Instructional support			Classroom organization		
Citation	Country	# Teachers	# Students	Mean class size	Grade(s)	Mean	SD	ICC (Kappa)	Mean	SD	α	Mean	SD	α	Mean	SD	α
Niklas and Tayler (2018)	Australia	265[a]	2,123	9	Pre-K	4.04[a]	0.93[a]	0.80[a]	5.14	0.91	0.87	2.38	0.96	0.85	4.60	0.92	0.89
Besnard and Letarte (2017)	Canada	53	180	3[a]	Pre-K	4.22[a]	0.69[a]	0.80[a]	5.26	0.72	.	2.59	0.63	.	4.82	0.73	.
Yoshikawa et al. (2015)	Chile	119	1876	21[a]	Pre-K	3.55	.	(0.94)	4.64[a]	.	.	1.72[a]	.	.	4.30[a]	.	.
Hu et al. (2016)	China	180	5,841[a]	32	K	3.98[a]	0.70[a]	0.89[a]	5.03	0.69	0.78	2.12	0.61	0.84	4.80	0.81	0.92
Slot et al. (2018)	Denmark	402	3,132	21	Pre-K	4.66[a]	0.48[a]	0.90[a]	5.85	0.42	0.73	2.45	0.55	0.64	5.69	0.47	0.83
Pakarinen et al. (2010)	Finland	49	679	14	K	4.81	0.79	0.85	5.13	0.80	0.93	3.97	0.92	0.88	5.34	0.66	0.90
Stuck et al. (2016)	Germany	57[a]	390	7[a]	Pre-K	4.44[a]	0.61[a]	0.73	5.57[a]	0.67[a]	0.86	1.63[a]	0.54[a]	0.90	6.13[a]	0.61[a]	0.90
Von Suchodoletz et al. (2014)	Germany	63	1,323[a]	21	Pre-K	4.21[a]	0.85[a]	0.80[b]	5.33[a]	0.75[a]	0.89	2.47[a]	0.78[a]	0.81	4.82[a]	1.02[a]	0.85
Cadima et al. (2018)	Portugal	178	3,827[a]	22	Pre-K	3.81[a]	0.99[a]	0.62	4.48[a]	1.08[a]	0.91	2.27[a]	0.93[a]	0.86	4.67[a]	0.97[a]	0.94
Sandstrom (2012)	Spain	25	634	25	Pre-K	3.86	0.56	.	4.79	0.63	.	2.16	0.49	.	4.32	0.67	.
Castro et al. (2017)	Sweden	165	850[a]	5	Pre-K	5.24	0.95	0.80[b]	5.66	0.74	.	4.76	0.97	.	5.31	1.13	.
Ertürk Kara et al. (2017)	Turkey	120	.		Pre-K	4.05[a]	1.17[a]	0.80[b]	4.11	1.10	0.78	1.90	1.09	0.85	3.36	1.31	0.92
Hoang et al. (2018)	Vietnam	60	1,474	27	K	4.54[a]	1.35[a]	0.78[a]	4.67[a]	1.39[a]	0.88	3.02[a]	1.13[a]	0.95	5.91[a]	1.51[a]	0.91

[a]Value derived from other data (Class overall mean score: Calculated overall CLASS score from CLASS domain scores; Class domain: calculated with dimension scores; Class size: calculated by dividing the number of teachers/classrooms from the number of students; Students: calculated by multiplying the average class size by the number of classes; ICC: calculated as an average across days and/or aggregated up with domain or dimension-level scores; Teachers: input number of classrooms when teacher information not provided; averages were weighted if from different sized groups).

[b]Pseudo-ICC calculated from percent agreement.

[c]Adapted from Hofkens et al. (in press).

interactions is moderately correlated with preschoolers' attention and impulse control in Turkey (Ertürk Kara et al., 2017), and cognitive self-regulation among socially disadvantaged preschoolers in Portugal (Cadima et al., 2016a), with interaction quality particularly effective in supporting students low in self-regulation skills (Cadima et al., 2016b). For young students in China, instructional support was associated with growth in executive function skills (Hu et al., 2020). In the large longitudinal experimental study in Ecuador, children in grades K-4 who were randomly assigned to teachers who displayed higher quality interactions had higher executive function skills, particularly for working memory (Campos et al., 2021). Higher quality interactions also reduced the likelihood of behavioral problems in the same year (Campos et al., 2021).

Regarding teachers' interactions that focus on organizational or instructional support of learning opportunities, among a sample of Finnish kindergarten students, the quality of teachers' instructional support was positively associated with student empathy and negatively associated with disruptive behavior (Siekkinen et al., 2013) and less task avoidant behavior in class (Pakarinen et al., 2011). Furthermore, the quality of teachers' classroom organization predicted learning motivation among Finnish kindergartners (Pakarinen et al., 2010). And across various cultural settings, teachers' emotionally supportive interactions, defined by identifying and responding to the emotional needs of their students, also supported student engagement in learning. In Swedish preschools, emotional support predicted student engagement (Castro et al., 2017) and a combination of positive climate, instructional learning formats, and language modeling predicted children's engagement in literacy learning (Norling et al., 2015).

Finally, each of the three domains of interaction quality predicted students' academic skills in many of the non-United States samples, including among Danish preschoolers (Slot et al., 2018) and Ecuadorian K-4th grade students, with the strongest effects in kindergarten and first grade (Campos et al., 2021); effects from kindergarten were evident into 6th grade (Campos et al., 2021). In Australia, teachers' instructional support predicted verbal skills among preschoolers (Niklas and Tayler, 2018), while in China, it is positively associated with reading, math, and science achievement among preschoolers (Hu et al., 2017). Other dimensions of interaction also contribute to academic skill growth. For example, emotional support in kindergarten was also positively associated with Finnish children's reading skills in first grade (Silinskas et al., 2017) and in Portugal, teachers' classroom organization predicted first grade students' vocabulary and print concepts (Cadima et al., 2010).

Together, research from this limited sample of international studies contributes additional empirical support for the teacher-student interactions as a developmentally salient feature of educational settings across cultures. In a combination of large-scale implementations, quasi-experimental, and experimental studies, the quality of teacher-student interactions shows modest associations with developmental and academic outcomes in very different cultural settings.

Conclusions and implications

In early educational settings, the preponderance of evidence suggests that teacher-student interactions play a significant role in fostering students' development and learning across wide-ranging countries and cultures; and as we have reported, from United States studies, interactions are responsive to targeted improvement models

such as coaching. For these reasons, describing, measuring, and improving teacher-student interactions, as a key feature of "quality" could be helpful to large-scale efforts to build and improve public education systems (Pianta and Hamre, 2022). The present study is an effort to examine parallels from non-United States samples to the larger evidence base from United States studies to examine the extent to which there is consistency in findings on teachers and students in non-United States countries across the globe.

By and large the results obtained from the United States and a multinational synthesis are quite consistent. Across the 16 countries, 4,400 teachers, and 42,000 students included in Hofkens et al. (in press) review and meta-analysis, the following conclusions were supported: (1) teacher-student interactions can be describing using a common set of descriptors and reliably observed using those descriptors across countries that vary in cultural and educational circumstances; (2) teacher-student interactions in United States and non-United States samples appear to have a common latent structure or organization such that aspects of teachers' emotional, instructional, and organizational behavior align with a framework for description that can be used consistently across countries; (3) these three broad domains of interaction have significant and beneficial impacts on students' learning and development. Although with many fewer exemplars (e.g., Yoshikawa et al., 2015), international studies also report that these common features of interaction can be improved through focused training and supports. Collectively, this pattern of results has powerful implications for theories of educational processes, for investments in workforce development systems that define quality in terms of observed interaction, and for professional development efforts that focus on teacher-student interaction as a means to improve the quality of educational opportunity and outcomes (Pianta and Hamre, 2022).

The conclusions above should be framed by certain caveats and limitations. The most notable among these qualifications is the limited variability in the Hofkens et al. international data set. The studies included in that analysis largely reflect Western approaches to early education in middle-upper income countries with far fewer low- and middle-income countries and cultures than would support a truly globalized international perspective. The CLASS was used as a common classroom observation tool to capture general properties of classroom interactions, without modifications to reflect nuances unique to culture, ethnicity, race, or language. A more recent edition of the CLASS (Teachstone, 2022) explicitly acknowledges cultural differences and nuanced interpretations of teacher-student interactions and may be better-suited for cross-cultural and cross-national work. As acknowledged earlier, the use of the CLASS across these wide-ranging settings is both an advantage and a disadvantage for examining evidence for a common definition. That is, a common metric is essential to analysis of consistency across varying contexts, while the lack of alternatives (either metrics of teacher-student interaction or of competing definitions of quality) constrains the interpretations that can be made, pointing to the need for further systematic research.

As a further limitation, the descriptive statistics reported (e.g., means, variance) in the study of Hofkens et al. (in press) and in the United States studies are all drawn from convenience samples; none are representative of the countries' populations or school systems. Therefore, cross-country comparisons of these indicators are not advised, nor is it appropriate to draw conclusions about the level of quality of teacher-student interaction in a given country.

That said, the descriptive findings point to the potential use of observations, such as CLASS or other scalable measures, in

representative samples of countries or important political, geographic, or cultural groups, which might drive investments in education systems and teacher development. Recent evidence supports framing quality in terms of a "package" of elements that each features observations of teacher behavior and classroom practice: teacher-student interactions, teachers' exposure of students to content through use of a targeted curriculum, and how teachers individualize their instruction to students' skills. These all rest on a core of teachers' knowledge and skill in engaging individual students through relationships and interaction. In a recent investigation, the elements of this package was each independently and additively predicted children's learning, were uncorrelated, and yielded a larger effect size than each individually (Pianta et al., 2020b).

We are interested in expanding and deepening a theory of teacher-student relationships and their value, as a basis for building and disseminating usable tools and knowledge. Developmental systems theory and attachment theory informed the core of all CLASS dimensions (rating scales) around properties of "serve and volley" exchanges that required attention to both the teacher's behavior *and* the student's response. This theory of classroom processes, the *Teaching Through Interactions* framework (Pianta and Hamre, 2009), hypothesized a taxonomic organization and definition(s) of teacher-student interaction that has proven useful in understanding and improving the impact of educational experiences in many thousands of classrooms across the United States and in in non-United States samples as described in this paper. Theory predicted that this latent structure would apply across all grade levels, content areas, or focus of instruction -- that "good teaching is good teaching" across the many permutations in which it takes place, precisely because interactions are a key pathway through which students learn.

With these general conclusions in mind, there are several implications for further cross-national research. Assuming an aim to use a common observational tool across countries, questions of interest might involve the extent to which characteristics of observers (e.g., prior knowledge, cultural background or differences, experience) and their training are associated with differential levels of reliability in the form of agreement. These questions essentially focus on the conditions that may limit or support the use of a common observational tool for defining quality across wide-ranging cultures. Also, as noted earlier, it is essential to expand the evaluation of assessments of quality across a wider range of income and culture, and to include a wider range of potential constricts and metrics that may be more salient in such contexts (e.g., Vermeer et al., 2016; Raikes et al., 2020; Betancur et al., 2021). Looking ahead, we are intrigued by technology (natural language processing, artificial intelligence) that can make observational tools more efficient in terms of time and expense, and more effective. Even if using common too(s)l might be advisable, examining common and country/culture specific features of interaction that foster students' learning and development might inform observational systems best suited to a culture's uniqueness as well as capturing what common elements of effective teaching. Research on conceptualizations and

measurement tools that define quality in terms of observed interaction, examining the commonalities and differences across countries, cultures, and groups, could help advance and deepen the impacts of interactions and relationships as the core educational resource for students' learning and development.

Author contributions

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Conflict of interest

RP is also the author of the Classroom Assessment Scoring System (CLASS), which is a focus of the manuscript. RP is also co-founder of Teachstone, the company that disseminates the CLASS.

The remaining author declares that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

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Assessing the quality of early childhood education and care in Australia: Challenges and opportunities

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While access to quality education in early childhood is an international priority, the characteristics of quality continue to be debated. In the Australian context, differing views on the characteristics of quality may be a result of differing stakeholder priorities. Divergent notions of quality may lead to initiatives that emphasize educator practice and frame a dominant discourse that situates responsibility for enactment of quality at Early Childhood Education and Care (ECEC) service room level. Challenges arising from initiatives driving increased access to ECEC coinciding with workforce shortages are addressed. National longitudinal research is needed to determine the impact of participation in ECEC on child outcomes, as is ECEC quality assessment across regions and jurisdictions over time. Prior to this, stakeholder conversations are needed to achieve consensus on the characteristics of quality. This could lead to the development of an instrument for assessing quality that is systemically relevant and could inform evidence-based decision making by ECEC teachers and educators, primary caregivers, regulators, researchers and policy makers to distribute accountability for quality across the ECEC system.

KEYWORDS

early childhood education and care, quality indicators, child outcomes, stakeholder priorities, National Quality Standard, Early Years Learning Framework, access and participation, teacher shortages

Introduction

Access to quality early childhood education and care (ECEC) is an international priority (Council of the European Union, 2019; Blanchi et al., 2022; Fredman et al., 2022). Target 4.2 of the United Nations Sustainable Development Goals states that by 2030, 'all girls and boys have access to quality early child development, care and pre-primary education so that they are ready for primary school' but stops short of describing *indicators* of quality, despite stating that without high quality early childhood education, the associated improved outcomes for children are unlikely to occur (UNESCO, 2017). For ECEC to be a sound economic investment and a sound investment in children and society, services should be 'of high quality, affordable and inclusive' (Council of the European Union, 2019). Indeed, whilst high quality ECEC has been demonstrated to be of benefit to the cognitive, language and social development of children in both the short and long term, participating in low quality ECEC may be a risk factor, particularly for children aged under three years with disadvantaged backgrounds (Melhuish et al., 2015).

Given the consensus on the importance of high-quality ECEC, clarity regarding the characteristics of quality ECEC is a priority. However, this paper shows that differing stakeholder priorities (Siraj et al., 2019) amongst policy makers, regulators, researchers, educators and primary caregivers inhibits a common understanding of quality. It is proposed that tensions surrounding notions of quality in the Australian context in 2023 may, to some extent, be a product of differing stakeholders' quality assessment priorities. Further, we suggest that these divergent notions of quality potentially undermine the alignment and cohesion of the system and leads to an over-reliance on actions and initiatives focused primarily or solely on educator practice, rather than distributing accountability across the various structural components and processes that constitute and govern the ECEC system.

Conceptualizations of quality

Despite apparent consensus on the importance of high-quality ECEC to support children's learning, development and wellbeing, the characteristics of quality emphasized and privileged by different stakeholders differ. Such inconsistency is not merely a reflection of the different perspectives these stakeholders bring to their understanding of quality because of their distinctive viewpoints, but arguably betrays different priorities and aspirations for the ECEC system and the need for improved coherence in the approach to achieving high-quality provision.

It is important to note that there are concerted efforts nationally (e.g., Council of Australian Governments, 2021) within separate jurisdictions (e.g., New South Wales Department of Education, 2022), within independent organizations (e.g., Thrive by Five, n.d.; Torii et al., 2017) and at local levels to strive for high-quality ECEC. A national mechanism to ensure quality standards are upheld under the National Quality Framework (Australian Children's Education and Care Quality Authority, 2020) was established under the Education and Care Services National Law Act 2010 No. 69 of 2010 (2022) and is constituted of a key guiding framework document, the Early Years Learning Framework for Australia (EYLF) (Department of Education Employment and Workplace Relations, 2009) (a revised version of which was released in January 2023 and will be phased in over the course of 2023) and the implementation of the National Quality Standard (NQS) by the Regulator within each jurisdiction. There is little doubt of the commitment to quality ECEC both in terms of rhetoric and increasingly, funding. However, the NQS provides a scorecard (*working toward*, *meeting*, or *exceeding* the NQS) for each *individual* ECEC service in the country and therefore frames a dominant narrative around quality which situates responsibility for the enactment of quality at the setting level.

The dominant narrative around quality is important. Whilst the NQS provides governments with valuable information about the ECEC system in an aggregated manner (Australian Children's Education and Care Quality Authority, 2022), it more importantly provides the basis for interventions where services are underperforming, increasingly forms the basis for differentiating ECEC services in a competitive market, and forms the basis of much of the effort to educate families about the importance of early education. Indeed, the NQF Annual Performance Report (2022) indicates that families' knowledge about the NQS is patchy; just 55%

are aware of the quality rating system and less than two-thirds of those (who are aware) know the rating of the service they use. Understandably, and as reported in earlier research (Cloney et al., 2016), many families focus on pragmatic concerns (e.g., location, cost) when choosing a service. Notwithstanding the relatively low importance families place on the quality rating system itself, they do show some sensitivity to important indicators of high-quality services provision, such as the presence of highly skilled educators and a high-quality early learning program, which receives equivalent weighting in families' decision-making process to their pragmatic concerns; but it should be noted that the basis on which families judge such indicators of quality is unclear (Australian Children's Education and Care Quality Authority, 2022).

A survey (1,143 respondents) and focus groups/interviews with parents and caregivers, within the state of NSW prior to COVID-19 (NSW Department of Education, n.d.), suggested that parents are concerned about quality, but they have only vague notions or broad conceptions about what *aspects* of quality matter; privileging the relationship between their child and the staff (68%) and their child's learning and development progress (65%). Predominantly, parents indicated that they saw the development of social skills (64%) and school readiness (60%) as the most important benefits of attending ECEC. Further, while most parents were aware of the qualifications of the room leader of their child's service (79%), many indicated that they value skills, life experience and commitment over qualifications. This government study is limited in scope but nevertheless illustrates some important divergence between the priorities and notions of quality held by parents, and the NQS. In so far as we have evidence, families prioritize pragmatic concerns as well as their children's relationships (with educators and other children) and learning and developmental progression, with a view to school readiness. But it is not clear that families link these priorities to educator qualification or other aspects of quality as defined and regulated within the NQS.

Given the centrality of the NQS (and the EYLF) to each early childhood service in the country, it is necessary first to explore conceptualizations of quality as set out in the NQS. Thereafter, structural and process quality, the growing emphasis on access to ECEC, the implications of teacher shortages for ECEC quality, and the challenges and opportunities associated with research-driven assessments of quality are addressed.

The National Quality Standard

The establishment of the National Law and Regulations, its enactment through the regulatory authorities and the development of the NQS, has meant that many features of a high quality ECEC system are implemented at service level, and regulated with fidelity by trained authorized officers who assess ECEC quality against benchmarked NQS quality areas: educational program and practice, children's health and safety, physical environment, staffing, relationships with children, partnerships with families and communities, and governance & leadership. These features of a high-quality system are typically linked to outcomes such as children's health and safety and the access to nurturing, responsive environments (Australian Children's Education and Care Quality Authority, 2022).

The NQS is intended to serve multiple purposes. First, it was intended to achieve improved consistency in the provision of ECEC across Australia. Second, ratings are published online and displayed in services, providing the opportunity for primary caregivers to make informed decisions about ECEC for their children, while at the same time providing a service-level monitoring system for jurisdictions and the nation. Furthermore, NQS quality assessment is intended to inform ECEC providers' ongoing efforts to improve the quality of service provision at a local level, and it is actively used as such. At a systems level, therefore, the nexus for quality lies between individual ECEC services and an intermittent regulatory mechanism (typically there are years between NQS ratings) that covers all aspects of service provision, i.e., the *quality areas*.

As a national indicator of quality, NQS quality assessment data provide information that informs policy and holds services accountable. However, research has indicated a mismatch between NQS quality ratings and quality when assessed with quality rating scales frequently used in research (Siraj et al., 2019; Kirk et al., 2022; Rankin et al., 2022). Indeed, Siraj et al. (2019) report that NQS quality ratings of *exceeding* the NQS (the highest rating) align with basic levels of quality on average when compared with evidence-based environmental rating scales designed to directly measure elements of curriculum, pedagogy and practice linked to high-quality ECEC provision, i.e., ECERS-E (Sylva et al., 2003) and the SSTEW (Siraj et al., 2015). The same study also demonstrated very high levels of variability in some instances: at times, the same services could be rated as exceeding the NQS but receive low ratings on ECERS-E and SSTEW, or the reverse. One of several possible explanations offered by Siraj and colleagues is illustrated by an example: ECERS-E includes an explicit focus on mathematics and science whereas the NQS has little direct focus on either. It is precisely these tensions and complexities surrounding the assessment of quality in ECEC in Australia, and the differing lenses used to focus on quality and assessment, that we highlight.

While all dimensions of the NQS are essential for ensuring high-quality ECEC services, the relatively equal weighting or status awarded to each quality area does not adequately reflect the potential for variance with respect to which aspects of quality are most meaningful or indeed predictive of child adjustment, wellbeing and learning, and moreover how these may work for different children across different contexts. Indeed, the different quality areas of the NQS are unlikely to be related in simple ways to child outcomes; they refer to quite different aspects of processes and practices within the ECEC context and have differing implications for professional support, capacity building and intervention. Furthermore, evidence to disentangle the ways in which the NQS quality areas contribute to child outcomes is lacking, as is clarity about the nature of the relationship between ECEC participation and consequential child outcomes. Currently, the only instrument that routinely captures early childhood outcomes, the Australian Early Development Census (AEDC) (Australian Government, n.d.), is difficult to meaningfully associate with ECEC participation or quality. These teacher-reported data relating to five key areas of early childhood development are collected every 3 years in children's first year of full-time school and reported for community, state/territory and national levels. Thus, in so far as child outcomes are concerned, the NQS rests on an evidence base that is substantial but somewhat distant from the context in which it is enacted, and the aspirations for a high-quality ECEC

system are only poorly linked to any system-level accountability measures or indicators.

What is clear is that some aspects of quality, as defined by the NQS, lend themselves more to regulation or regulatory frameworks than others. A regulatory system like the NQS is indeed effective for regulating children's safety and security, for ensuring environments are effective for early childhood teaching and learning, or that educators hold particular qualifications; areas that classically fall under the construct of *structural quality*.

Standards of the kind embodied in the NQS, alongside the EYLF, can adequately reflect national values and priorities for the ECEC system (Organization for Economic Cooperation and Development, 2021) and tell us that a particular domain or need is being met or achieved, which is highly appropriate for many aspects of both education and care. High quality *pedagogy*, however, is enacted by ECEC professionals and teams, is reflected in their beliefs, skills, and knowledge, and is cultivated through their professional growth (e.g., Connors-Tadros et al., 2021).

It would be a mistake to confuse the standards that constitute the NQS with developmentally informed early learning standards that are developed through a consultative process, informed by the Australian cultural, political, and socioeconomic context, and linked systematically to curriculum, assessment and planning for learning. To drill down into notions of quality in this regard, it is necessary to address the symbiotic nature of process quality and structural quality.

Process quality and structural quality

The EYLF guides pedagogy and practice with children from birth to 5 years of age in Australia. The 2009 version includes five guiding principles intended to 'underpin practice that is focused on assisting all children to make progress in relation to the Learning Outcome(s)' (p. 13), namely *Secure, respectful and reciprocal relationships, Partnerships, High expectations and equity, Respect for diversity,* and *Ongoing learning and reflective practice*. After being in revision from 2020, the revised EYLF was released in January 2023 and the transition to the EYLF V2.0 (Australian Government Department of Education, 2022) will take place over 2023. It was widely anticipated that the revised document would add two further principles of practice: one that focused on sustainability, and a second that focused on Aboriginal and Torres Strait Islander perspectives on ECEC. The EYLF V2.0 has indeed introduced these practice principles as well as a third new principle entitled *Collaborative leadership and teamwork*. In addition, an existing principle entitled *Secure, respectful and reciprocal relationships* has been updated to include relational pedagogy (Australian Children's Education and Care Quality Authority, 2023).

Both the first and second versions of the EYLF include five learning outcomes for children. These are *Children have a strong sense of identity, Children are connected with and contribute to their world, Children have a strong sense of wellbeing, Children are confident and involved learners,* and *Children are effective communicators*. These are effectively early learning and development standards (ELDS) which guide pedagogical decision making; programs that align their curricula closely with the EYLF could be regarded as achieving high quality ECEC. ACECQA describes the EYLF V2.0 revisions as 'strengthen[ing] the connection between the EYLF (V2.0) and the

National Quality Standard in areas such as transitions, sustainability, theoretical approaches, critical reflection, the importance of Aboriginal and Torres Strait Islander ways of being, knowing and doing, and inclusion' (Australian Children's Education and Care Quality Authority, 2023). However, whilst aligning with important broader societal priorities, the EYLF has expanded from 51 pages to 71 pages and will increase pressure on ECEC teachers and educators to achieve EYLF notions of quality, some of which do not form part of quality assessment under the NQS.

EYLF notions of quality inform values and approaches that need to be incorporated into a service's efforts to deliver high-quality early education and care. However, it is unclear how aspects of the EYLF that inform quality *directly* relate to child outcomes and positive transitions to school. From a pedagogical perspective, a more content-driven curriculum may lead to less *play* in play-based learning. Educators who themselves are in the process of qualifying as teachers may have been appointed to the role of teacher due to ECEC workforce shortages. Play provides opportunities for children to acquire conceptual understanding, to apply these concepts in a range of situations and in this way to contribute to deeper learning (Zosh et al., 2017). In their desire to meet EYLF notions of quality while still learning about play as the vehicle for learning themselves, such educators may rely more on teacher-directed learning rather than achieving the necessary balance in teaching and learning strategies.

Countries differ in the way in which ELDS are structured and as such may be classified as *skills progression documents*, *framework documents* which include curriculum frameworks, *inclusive frameworks* (such as Australia's EYLF), and *general learning goals documents* (Kagan et al., 2013). Australia's EYLF now articulates eight practice principles and five broad learning outcomes and relies on early childhood educators having strong pedagogical content knowledge (Shulman, 1986), acquired in preservice teacher education courses, that equips them to enact the early years planning cycle: observing child behaviors, assessing what the observed behavior indicates the child knows or can do, planning opportunities for playful learning that consolidate or extending knowledge and/or capabilities, evaluating and reflecting on the efficacy of the learning experience, and once again, observing what the child demonstrates they know or can do (Australian Children's Education and Care Quality Authority, 2019).

The Early Years Learning Framework planning cycle has been central to the enactment of the EYLF (Department of Education Employment and Workplace Relations, 2009) and remains central to the EYLF V2.0 (DoE, 2022). Assessment is a critical element of teaching and learning within the planning cycle. In this way, the realization of quality pedagogical practice is primarily linked to assessment processes within ECEC environments. Yet, national data indicate that the Assessment and Planning Cycle (Element 1.3.1) of the NQS continues to be the element most likely to achieve a 'not met' rating (Australian Children's Education and Care Quality Authority, 2020; Australian Children's Education and Care Quality Authority, 2022). Cohrssen (2021) has argued that the provision of learning trajectories would assist early childhood educators to meet NQS QA1.3 (Assessment and Planning Cycle) whilst retaining the focus on child-centric, play-based learning, with pedagogical practice that is attuned to community, family and child priorities. Learning trajectories would thus lend

themselves to more consistent access to high quality teaching and learning for all Australian children by supporting ECE teachers and educators.

Within the Australian regulatory system, notions of structural quality are assumed to go hand-in-hand with, and be enlivened by, process quality; strength in both elements of quality are necessary to support overall child development (Ishimine and Wilson, 2009). A recent systematic review of studies conducted in 10 countries (which included one Australian study) investigated the impact of adult-child ratios and group size as elements of structural quality on outcomes for children aged from birth to 5 years (Dalgaard et al., 2022). This review tentatively suggests that these characteristics of structural quality are associated with higher levels of process quality, whilst noting that this requires further investigation, particularly with regard to children under the age of 2 years. Dalgaard and colleagues also note that due to the paucity of studies that met inclusion criteria for the systematic review, the effects of adult-child ratio and group size could not be investigated separately. Amongst other limitations, the authors acknowledge that the overall quality of the studies was low, and much of the research was conducted prior to 2000; highlighting the need for contemporary, high-quality research since this predates the introduction of the National Quality Framework in Australia.

In a separate systematic review of research that explored the relationship between adult-child ratios and developmental outcomes of pre-school aged children, Perlman and colleagues report 'few, if any' relationships between ratios and child outcomes (Perlman et al., 2017). However, Perlman and colleagues also caution against using such findings to justify reducing adult-child ratios noting multiple possible explanations such as the number of studies that met inclusion criteria, and the possibility that some children are more affected than others by lower or higher adult-child ratios. There is a clear need for empirical research that addresses how teacher characteristics and behavior are related to child outcomes in ways that take into account important environmental/child characteristics, which includes ratios but also reflects how educators interact with children, and the distinctive children in their care.

Use of the mandated EYLF (Department of Education Employment and Workplace Relations, 2009) and the EYLF V2.0 (Australian Government Department of Education, 2022), along with educator and teacher qualifications and adult–child ratios, are elements of *structural quality*, whereas teachers and educators are key enablers of *process quality*; the back-and-forth interactions that support being, belonging and becoming and enliven structural quality (OECD Data, 2022). Interactions feature prominently in the framework as part of everyday practices: they are listed 19 times in the 2009 version and are listed 32 times in the 2022 version. Enacting responsive pedagogy is an interactive process that involves the child, the teacher, learning environment and broader society; these systems continuously influence and are influenced by each other (Bronfenbrenner and Morris, 2006; Sheridan, 2009). Educators are responsible for initiating high quality interactions that support children's learning and promote respect for diversity, are both individual and collaborative, verbal and non-verbal. Such interactions can be difficult to establish and sustain within ongoing practice (OECD Data, 2022). Nevertheless, despite these uncertainties and challenges, the dominant narrative appears to be that participation in ECEC assures access to high quality ECEC.

An emphasis on access

As noted previously, parents and caregivers' assessments of *quality* may be influenced by pragmatic considerations, such as improved opportunities to (re)join the workforce. Here, the opening hours of childcare facilities and proximity to home may be regarded as characteristics of quality, particularly in contexts where families have less access to ECEC (Ishimine et al., 2009; Cloney et al., 2016). Australian governments increasingly recognize that high quality ECEC benefits children, families, and society more broadly (Beatson et al., 2022) and increased access to ECEC for children is being prioritized. However, research conducted in the United Kingdom suggests that just giving access may not be the answer (Melhuish and Gardiner, 2021).

If access and participation are deemed to address primary caregivers' priorities for their children, Australia ranks lower than other OECD countries, where attendance is around 95% (Organization for Economic Cooperation and Development, 2020) as the number of children enrolled in a preschool program has declined in recent years. According to data from the Australian Productivity Commission (2021), the number of Australian children enrolled in a preschool program in the year before school declined from 92.4% in 2016 to 87.7% in 2019. Across Australian states and territories, the largest drops have occurred in Queensland (from 93.8% in 2016 to 84.8% in 2019) and Victoria (from 98.4% in 2016 to 87.8% in 2019), where families face significant costs for preschool compared with other states and territories (Pilcher et al., 2021). On the other hand, the Department of Education reports that 96% of children were enrolled in 600 h of preschool (the year prior to school entry) in 2019, an enormous increase from 12% in 2008 (Australian Government Department of Education, n.d.). Setting aside the differences in reported enrolment, the Department of Education also acknowledges that enrolment and full participation differ: in 2019, only 72% of the families of children enrolled in preschool used the full 600 h per child, and further reports that attendance rates were lower for Aboriginal and Torres Strait Islander children, and vulnerable and disadvantaged children (Australian Government Department of Education, n.d.). In 2022, both Victoria and Queensland introduced early childhood education packages to support improved access to ECEC and it will be important monitor the impact of such programs, particularly for children described as belonging to 'equity groups' (Australian Productivity Commission, 2021). The Australian Productivity Commission (2021) reports that children from so-called equity groups have lower enrolment rates across Australia. These include children with low SES backgrounds, non-English speaking backgrounds, living in regional/remote communities, children with disability, and Aboriginal and Torres Strait Islander children. In addition, Australian children who experience multiple indicators of disadvantage are less likely to attend ECEC (Wong et al., 2014). The Organization for Economic Cooperation and Development (2020) includes disabilities, ongoing long-term health conditions, or having primary caregivers with asylum seeker status as indicators of disadvantage.

Challenges in the accurate reporting of data on access and participation of Australian children may stem from the measurements used to generate such data. The OECD defines participation rates as net enrolment rates, 'calculated by dividing the number of students of a particular age group enrolled in ECEC by the size of the population of that age group' (Organization for Economic Cooperation and Development, 2020). However, according to the Australian Productivity Commission (2021), ECEC participation is defined as follows:

- Children using child care — the proportion of children who are enrolled in Australian Government CCS approved child care services by age group (0–5, 6–12 and 0–12 years)
- Preschool program participation — the proportion of children who are enrolled in a preschool program in the YBFS. To be considered as enrolled, the child must have attended the preschool program for at least 1 h during the reference period, or be absent due to illness or extended holiday leave and expected to return. State and Territory data are based on the location of the child's residence.

The first criterion does not account for families that enroll their children simultaneously in ECEC services that may not be Child Care Subsidy-approved ECEC services (such as kindergartens within private schools). Furthermore, neither measure accounts for children simultaneously enrolled in different types of early childhood services. For example, a child may attend long day care (center-based ECEC provided by professional educators, with children often grouped by age) on 2 days each week and family day care (education and care provided to a small group of children within the carer's home) 1 day per week. Or a child may attend long day care 5 days per week, but leave early to attend a kindergarten program (an education program delivered by a degree-qualified early childhood teacher) two afternoons per week. Further, enrolment data differ from information relating to hours of child actual attendance and frequency of attendance.

To address these challenges systematically, the Commonwealth Government and state and territory governments are pursuing a bilateral reform agenda aimed at increasing preschool enrolment and attendance (Australian Government Department of Education, n.d.). Attendance targets will be set from 2024, and bilateral collaboration is planned to develop, trial and implement a preschool outcomes measure. Further, acknowledging the need to increase the quality of preschool data and to develop a new Preschool Performance Framework, the Commonwealth Government has committed to spending an additional $28.7 million. Information regarding the Preschool Performance Framework is awaited.

Prioritizing preschool enrolment and attendance presupposes a workforce to meet the needs of increased participation. Herein lies a further challenge.

Implications of teacher shortages for ECEC quality

For more than a decade, looming shortfalls of early childhood teachers and educators, and concerns regarding pay and working conditions, have been reported in the media. As 2023 begins, the expansion of ECEC provision in Australia is hampered by shortages of teachers and educators and, by 2024, Australia will need to have recruited 6,800 degree qualified early childhood teachers and over 30,000 diploma- and certificate-qualified educators (Australian Government, 2021). Urgent measures that are currently being investigated will need to be implemented for some time to increase ECEC workforce participation and to upskill diploma-qualified educators to bachelor's degree teacher qualifications.

In the meanwhile, ECEC services that cannot meet staffing requirements (such as having a qualified early childhood teacher on staff) can apply for a waiver as a last resort to continue operation. This reflects the tension between meeting structural quality standards and meeting the access needs of primary caregivers. Here, different types of ECEC are impacted to differing degrees: 15% of long day care services hold a staffing waiver compared with 3% of preschools/kindergartens (Australian Children's Education and Care Quality Authority, 2022). Consequently, many more long day care services are staffed by educators working toward the necessary qualifications, and who may thus not yet possess the pedagogical content knowledge (Shulman, 1986) necessary to enact the EYLF (Department of Education Employment and Workplace Relations, 2009) and thereby support children's learning; at the very least, this sets up inequalities in children's access to high quality programs due to the variability of teacher preparation. This also means that educators employed as teachers under waivers while they complete their teaching qualifications may find themselves asked to supervise students who are also studying to become teachers.

As accountability increases within education, there has been a movement to more standardized teacher performance assessments (Darling-Hammond, 2014). However, Bird and Charteris (2021) have voiced concerns that such teacher performance assessments are 'high stakes filters that gatekeep who is permitted to become a teacher' (p. 504) and that the introduction of teacher registration in the ECEC sector is not associated with remuneration equivalence with the school sector. It should be noted that both implementing teacher registration and investigating options for improving workforce pay and conditions have been acknowledged as short-term (within 3 years) national priorities (Education Services Australia, 2021). Acknowledging the intent for teacher performance assessments to increase assurance of quality teaching and learning and the importance of graduates being ready to teach, we suggest that placing responsibility on individual teachers to meet such minimum standards is unreasonable. However, if accredited teacher education courses systematically and incrementally equip students with the necessary skills to be ready to teach, and practicum placements require pre-service teachers to demonstrate 'the fluidity and culturally responsive pedagogy' (Bird and Charteris, 2021) that characterizes early childhood education, teacher professional assessments should be achievable and avoid being an exercise in pedagogical reductionism.

By implication, the responsibility for the capabilities of ECEC graduate teachers should be distributed through multiple systems: the Australian Institute for Teaching and School Leadership (AITSL) which determines the Australian Graduate Teacher Standards, the state and territory-level organizations which accredit initial teacher education courses on behalf of AITSL, and institutions of higher education which deliver initial teacher education courses. Nonetheless, whilst a national teacher professional assessment would require graduates to demonstrate their ability to apply academic knowledge to professional practice (Bhatnagar and Sudhakar, 2017; Delamarter and Wiederholt, 2020), permission to hold staffing waivers directly negates the feasibility of introducing a national teacher performance assessment if ECEC services do not have early childhood teachers and operate under waivers.

ACECQA states that, 'A service granted a waiver can still achieve ratings of Meeting National Quality Standard and Exceeding National

Quality Standard. This is because the service is taken to comply or not required to comply with the requirements of the National Regulations and elements of the NQS that are covered by the waiver' (Australian Children's Education and Care Quality Authority, n.d.). Research has found strong evidence of the important role played by *qualified* early childhood teachers in achieving overall environmental quality, particularly with regard to program structure, language and reasoning (Manning et al., 2019). Concerns in this regard are not new: discussing workforce challenges nearly a decade ago, Cumming et al. (2015) commented on educators at times being 'promoted beyond their skills, experience and knowledge' (p. 6) and further suggested that without sustained mentoring and without opportunities for professional learning, educators in leadership roles may burn out and resign. In summary, the shortage of early childhood teachers and educators is significant, and research is needed to examine the impact of unqualified teachers on efforts to lift quality standards and support child outcomes.

Research-driven assessments of quality

Research-driven assessments of quality bring a range of differing methodological approaches and thus may identify differing priorities to enable and support high-quality provision in ways that are aligned with the priorities of different stakeholders. This is a complicated issue as the priorities of different stakeholders have diverse sources and foci. For instance, within the Australian ECEC sector and regulatory environment, there is an unwavering focus on maintaining established statutory ratios. However, through a research lens, the issue of ratios is somewhat conflated with child characteristics and the skills or behaviors of educators and teachers (Perlman et al., 2017; Dalgaard et al., 2022). The focus on ratios as a cornerstone of high-quality provision is presumably affected by various issues, including an evidence base established prior to the onset of the NQS (Melhuish et al., 2015) that linked educator qualification to elements of process quality and child outcomes, but also to working conditions and the state of the workforce, which are, at a different level, essential to sustaining a high-quality ECEC system (see Connors-Tadros et al., 2021, for a discussion). Investigating the issue of ratios and quality is further complicated within the Australian context because of regulated uniformity, different models of ECEC provision, and because of a lack of agreement about how high-quality provision is best defined. Nevertheless, clarity on what aspect of quality is to be prioritized (e.g., process quality) and which outcomes are to be privileged (e.g., children's learning and development in specific domains of curriculum) allows for research that can meaningfully contribute to practice (and child outcomes). This could occur, for example, by examining the quality and extent of children's interactions with educators and teachers, and the extent to which such variation is a function of the service-provision model (e.g., program design, staffing norms, etc.), in relation to child outcomes.

A further challenge within the Australian context is the need for quality assessment across multiple regions or jurisdictions over time using instruments that are research informed [such as CLASS (Mashburn et al., 2008), RIFL (Sokolovic et al., 2021), ECERS (Clifford et al., 2010), and SSTEW (Siraj et al., 2015)], and have established associations with practices or outcomes that we know to be beneficial for children. Representative data of this kind are necessary in order to accurately determine the impact of measures intended to raise quality in its various manifestations. By way of example, while ECERS is

implemented in over 48% of states in the United States with Quality and Improvement Systems (Reinke et al., 2018), such large-scale quality assessment in the Australian context is rare. Acknowledging that ECERS has received much criticism for creating standardization of early childhood education (Reinke et al., 2018) and reducing early childhood programs to a set of universal criteria (i.e., the same standards applied across all early years settings for structural and process quality monitoring), ECERS is designed to value three basic needs that all children should have: 'Protection of their health and safety, the facilitation of building positive relationships and opportunities for stimulation and learning from experience' (Clifford et al., 2010). Environmental rating scales are not perfect and are not as predictive as people might assume of links between high-quality ECEC and positive child outcomes, but they have been shown in some cases to measure quality in a way that does predict child outcomes (Melhuish and Gardner, 2021) and they are designed to focus on those elements of curriculum, pedagogy and practice that have been shown, in independent research, to predict positive child outcomes.

Within Australia, there is an opportunity to establish a uniquely Australian research-driven assessment of quality that draws from accumulating international empirical evidence that characterizes a high-quality learning environment as one in which educators establish and maintain positive relationships, provide safe environments and support learning experiences that encourage children's cognitive and socioemotional development and their wellbeing (Melhuish et al., 2015; Taggart et al., 2015; Slot et al., 2018). With this opportunity comes a challenge: to arrive at shared notions of quality which *distribute accountability* for achieving quality across stakeholders within the ecological system within which individual children learn and develop (Bronfenbrenner and Morris, 2006).

Conclusion

Nearly 10 years ago, Ishimine and Tayler (2014) described the need for a valid, reliable measure that assesses quality at both room and educator level in the diverse ECEC contexts that characterize the sector in Australia. If there is agreement that quality needs to shift, then the reflexive response within the current system is to put further pressure on the shoulders of directors, educational leaders and educators, and to use quality assessment as accountability. In this paper, we acknowledge the contribution of the NQS, whilst distinguishing between regulatory-based assessments of quality and research-based assessments of quality, noting that ECEC system stakeholders have differing priorities and that these differing priorities are manifest in differing perceived quality characteristics. All are relevant.

What is needed, however, is a process to arrive at co-constructed characteristics of quality that considers the various priorities of all stakeholders (policy makers, regulators, researchers, educators, and primary caregivers). Further, any instrument for assessing quality needs to be *systemically* relevant: data generated should be useful to ECEC professionals to inform initial teacher education, in-service practice and professional learning. Data should be useful to primary caregivers to support informed decision making and should be appropriate to inform evidence-based policy making. Finally, data should be relevant to independent researchers seeking to assess the impact of quality characteristics for child learning and development and to test the efficacy of the measure itself.

Determining the impact of participation in ECEC requires national, longitudinal research. Such nationally representative research should gather data on dosage in the form of ECEC attendance, participation percentage rates, and child outcomes, but first of all, consensus on measures of quality is needed. At a time of national consensus on the importance of high quality ECEC, increased investment and workforce upheaval, it is time to engage in conversations and processes that address the differences between stakeholders' assessments of quality in ways that distribute accountability for achieving improved outcomes for all children through high quality ECEC systems. Preliminary indications are that we have not yet begun this process.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Characteristics of high-quality early childhood education and care: a study from Australia

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The early childhood environment influences a young child's growth, wellbeing, and development, and the young child's environment determines lifelong outcomes. The impact of the environment on children's developing brain capacity has been shown to affect the hard wiring that occurs in the 1st years of life. Brain development in the early years is shaped and formed in response to environmental experiences. The learning environment in early childhood education and care (ECEC) services is designed by the early childhood educators— for example, by establishing and implementing routines, deciding on how to resource the environment, and developing and maintaining relationships with children, families, and staff. The Australian Children's Education and Care Quality Authority (ACECQA) has developed and implemented a national quality standard (NQS) that addresses the quality of the learning environment in ECEC services. The NQS comprises seven quality areas that early childhood educators implement. Even though early childhood educators are the key decision-makers in implementing quality learning experience for children, their perspectives on the NQS have not been heard. This study presents the early childhood educators' perspectives on the characteristics of long day care (LDC) centers (for children aged from birth to 5 years) that they perceived to be important for provision of high-quality ECEC. Findings are presented from 15 interviews with early childhood educators regarding their perspectives of what characteristics enabled their LDC center to be assessed as Exceeding the NQS, one of the highest quality ratings possible. Findings indicate that the educator characteristics and their qualities in leadership and teamwork were important in determining high-quality ECEC. However, while the educators' attributes were deemed important, it was clear that there was an interconnectedness of factors including the relationships between children, families, and educators, the financial capacity, the governance, and structure of the LDC center that contributed to the provision of high-quality ECEC. Recommendations are that LDC centers could be incentivised to provide professional learning for staff leadership, teamwork, and capability to provide high-quality ECEC.

Provision of quality ECEC in Australia

Research has shown that investment in high-quality early childhood education and care (ECEC) produces significant return for society over the long term (Heckman, 2013). Across the world, there is consensus that the quality of early childhood programmes has beneficial and long-lasting effects on children and society (Organisation for Economic Cooperative Development (OECD), 2018), while the

competence of the workforce is a salient predictor of ECEC quality (Urban et al., 2012). What the early childhood educator does influences the children's experiences in the early childhood setting and impacts the quality of the learning opportunities for children (Organisation for Economic Cooperative Development (OECD), 2018; Manning et al., 2019). Yet, it is unclear from research what early childhood educators perceive to be important in the provision of high-quality ECEC.

In Australia, the quality of ECEC is recognized as being of critical importance (Pascoe and Brennan, 2017; Organisation for Economic Cooperative Development (OECD), 2019). Evidence suggests that high-quality ECEC supports children's optimal development, wellbeing, and educational outcomes (Sylva et al., 2014; Melhuish et al., 2015; The Front Project, 2019; Wylie, 2019). High-quality ECEC also contributes to society's productivity and social capital (Organisation for Economic Cooperative Development (OECD), 2018). Quality ECEC is viewed as a multi-dimensional concept that supports children's outcomes; it is temporal and contextualized within societal conditions (Dahlberg, 2013). Constructs of quality ECEC that include the experiences of children, families, and educators; interactions between stakeholders; the structural conditions such as staff-to-child ratios, group size, and staff qualifications; and the process aspects of quality such as interactions are critical to understand the multifaceted aspects of quality of an early childhood setting.

Despite the perceived benefits of quality ECEC, definitions of quality are elusive owing to its subjective nature (Pianta et al., 2016). Even though there is not agreement on a definition of quality ECEC, evidence highlights the importance of high-quality ECEC (Organisation for Economic and Cooperative Development (OECD), 2012; Tayler, 2012; Melhuish et al., 2015). As a result, the Australian government has invested heavily to support children's learning and development with the establishment of the National Quality Framework (NQF) that resulted from the Council of Australian Governments (COAG) (2008) Partnership Agreement. The NQF aims to raise the provision of quality ECEC with continuous improvement embedded in the implementation of a national law and national regulations, the Early Years Learning Framework (EYLF) (Department of Education Employment and Workplace Relations, 2009), a National Quality Standard (NQS), and a national quality assessment and rating (A&R) process (Australian Children's Education and Quality Authority (ACECQA), 2023).

The national quality framework assessment and rating process

ACECQA is the statutory body responsible for the implementation of the NQF. The NQF applies to ECEC services who receive funding from the government to operate. Services include long day care services (LDC) (for children aged from birth to 5 years), preschools/kindergartens for children aged from 3 to 5 years, family day care where children are cared for in an educator's home, and outside of school hours care for primary school aged children from 5 to 12 years. The focus of this study was on LDC services.

ECEC services in Australia are assessed for the provision of quality under an Assessment and Rating (A&R) process against the NQS. The NQS is a comprehensive guide with seven quality areas that LDC services are required to meet. They are Quality Area QA1: the educational programme and practice; QA2: children's health and safety; QA3: the physical environment; QA4: staffing arrangements; QA5: relationships with children; QA6: collaborative partnerships with families and communities; and QA7: governance and leadership (Australian Children's Education and Quality Authority (ACECQA), 2023). Within each quality area are relevant standards and elements that guide ECEC services' quality practice.

The A&R process commences with the ECEC service developing their Quality Improvement Plan (QIP), a plan that highlights the LDC service's strengths and areas for improvement. Services submit the QIP to ACECQA within 4 weeks of this notification, and the authorized officer visits 5 to 8 weeks later. An authorized officer, representing the regulatory authority of the jurisdiction, visits and assesses the ECEC service during the A&R process.

The authorized officer observes practices and the environment, discusses policies and procedures with staff, reviews documents pertaining to quality practice, and completes an A&R report of the seven quality areas of the NQS (Australian Children's Education and Quality Authority (ACECQA), 2023). The LDC center is assessed at one of four quality ratings: Exceeding, Meeting, Working Toward the NQS, or Significant Improvement Required. Assessment occurs every 3 years for services who receive an Exceeding the NQS rating; every 2 years for the Meeting rating; and every year for services who received the rating of Working Toward achieving the NQS.

In late 2022, 88% of Australian ECEC services were assessed as Meeting or Exceeding the NQS rating (Australian Children's Education Quality Authority (ACECQA), 2022). Five years ago, just 73% of services were assessed as Meeting the NQS rating (Australian Children's Education Quality Authority (ACECQA), 2022) demonstrating the significant improvement of provision of quality of ECEC. Yet, only 27% of these services achieved a high-quality rating of Exceeding the NQS rating. Furthermore, there were 12% of services that did not meet the NQS, that is, they had a rating of Working Toward the NQS or Significant improvement required (Australian Children's Education Quality Authority (ACECQA), 2022). This falls short of the NQF goal to provide quality ECEC for all children (Fenech et al., 2012) 10 years after the implementation of the NQF. Specifically, a study undertaken by Harrison et al. (2023) shows that Meeting and Exceeding the NQS rating is more likely associated with not-for-profit providers of ECEC, compared to for-profit.

The NQF was developed to align with Organisation for Economic Co-operation and Development (OECD) (2006) recommendations. A criticism of the NQF has been that the NQF is "dependent on international research evidence and ideological argument" (Ishmine et al., 2009; p. 718). Early childhood research that takes account of the Australian context and characteristics has been limited regarding the provision of high-quality ECEC. This study makes a key contribution to this research gap by investigating the characteristics of Australian LDC centers who

achieved an Exceeding the NQS rating from the perspective of the LDC centers' early childhood educators. In the context of this research, Exceeding the NQS rating is considered to be providing high-quality ECEC.

High-quality ECEC

Characteristics of high-quality ECEC across the Western world have focussed on the structural and process quality features of the ECEC service (Bennett, 2008). Structural quality is regarded as measurable and aligned to regulation, and so the most reported structural features characterizing structural high-quality ECEC are educator qualifications, children's group sizes, and the staff-to-child ratios (Organisation for Economic Cooperative Development (OECD), 2017; Manning et al., 2019). These features are related to child outcomes which are included in most western countries' regulations and the foundation for process features of quality. Process features of quality include the staff-to-child interactions and relationships; staff and family interactions and relationships; and staff-to-staff interactions and relationships (Pianta et al., 2016; Tayler et al., 2016). The process features of quality are impacted by the staff characteristics, including staff leadership (Gibbs, 2020), staff governance and management (Australian Children's Education and Quality Authority (ACECQA), 2023), staff wellbeing (Logan et al., 2020), and work conditions (Organisation for Economic Cooperative Development (OECD), 2018; Manning et al., 2019; Fenech et al., 2021).

Researchers agree that the provision of a quality ECEC programme is significantly impacted by leadership (Siraj-Blatchford and Manni, 2006) and that leadership supports children's learning outcomes (Colmer et al., 2015; Gibbs, 2020). Distributed leadership was identified by Gumus et al. (2016) as most frequently contributing to quality ECEC, building on Siraj and Hallet's (2013) view that leadership is a "relational and communal concept where all can be a leader and engage in leadership, benefit from leadership and exercise power and individual agency" (p. 10). Thus, leadership in ECEC is not solely about one person being the leader with others following, but rather all educators engage in contributing to quality ECEC.

What the staff bring to their ECEC role influences process quality. The individual staff attributes, or strengths, are intangible and often are "hidden" characteristics of high-quality ECEC. Attributes that have been identified as important for ECEC educators in their roles include motivation, enthusiasm, values, and complex decision-making (Cleveland and Krashinsky, 2005); practical wisdom that includes expert knowledge, appropriate judgement, thoughtful action, and autonomy (Goodfellow, 2003); and communication, listening, managing effective communication, reflection, passion, and emotional intelligence (McMahon, 2017). Specific staff attributes that relate to how the team functions, which in turn has been found to reduce absenteeism and consequently increase productivity (Haslip and Donaldson, 2021). The staff attributes are likely to make a strong contribution to the teamwork of an ECEC center so that common goals are enacted.

ECEC teamwork

Being a leader means that there is a team of people with whom the leader works. Teams are viewed as being of key importance for the success of organizations (Delice et al., 2019). Working in a team means that all educators work together toward a common goal, and in the case of working in an LDC center, the goal is to provide high-quality ECEC. The NQS defines team collaboration as being

> "based on understanding the expectations and attitudes of team members, and build on the strength of each other's knowledge, help nurture constructive professional relationships" (Australian Children's Education and Quality Authority (ACECQA), 2023, p. 215).

Teams face constant challenges, and being able to adapt team practices as challenges arise is a measure of a successful team (Delice et al., 2019). Undergoing the A&R process is one such challenge the LDC center ECEC teams face. If team members change, then this is likely to pose challenges to the team's existing operations, until the team "gels" again. This is a key concern for LDC centers in Australia as the early childhood sector has reported to have up to a 30% attrition rate in 2020 (The Front Project, 2019).

In ECEC centers in Australia, all educators are likely to make an important contribution to the quality of the early childhood programme, and all educators are considered to influence children's learning and development. Within this context, the practices and expertise of all educators in early childhood settings matter. The educators' approach to their work impacts the quality of the early childhood programme. Early childhood educator teams are comprised of differently qualified staff: Staff may have an early childhood teacher's (ECT) degree from a university, or a Diploma or Certificate III in early childhood education, but most research on the impact of provision of quality ECEC has focussed on degree qualified early childhood teachers and directors (e.g., Urban et al., 2012; see Manning et al., 2019), with little research attention given to the views of the other educators who are essential to the ECEC team. It is unclear from past research what the (non-teacher) educators' perspectives are about working toward provision of quality ECEC owing to the focus upon early childhood teachers. Yet all educators are part of the team who provide the ECEC, and so their perspectives are important. Furthermore, research from the Longitudinal Study of Australian Children (LSAC) has shown that the staff qualified with either a Diploma of ECEC or an early childhood degree (that is teachers) delivered similar outcomes for children (Warren and Haisken-DeNew, 2013). The provision of high-quality ECEC is likely to be a team effort, not just the result of the early childhood teachers.

Within Australia, the context of this research, LDC centers are required to be open for a minimum of 8 h per day, and 48 weeks per year with each staff member holding an ECEC qualification (Australian Children's Education Quality Authority (ACECQA), 2022). Qualified ECTs usually work less hours compared to Diploma or Certificate III staff, for financial reasons, yet it is the Diploma and Certificate III ECEC trained educators who are required to be present at all times the LDC is open for children to attend. The National Education and Care Services Regulations state that teachers need to be present for a certain number of hours per

week, depending on the number of children at the service. This may vary across jurisdictions—for example, in the state of New South Wales (NSW), a center with <25 children per day is required to have a trained teacher for 20% of the opening time, while a LDC center with 25 to 59 children is required to have an ECT for at least 6 h per day (NSW Legislation, 2023). ECTs often only work during the middle part of the day, from 9 a.m. to 3 p.m.; therefore the Diploma or Certificate III educators have the important role at the beginning of the day, of setting up the learning environment to make it welcoming, stimulating and safe, and communicating with families when children are dropped off. At the end of the day, these educators are often tasked with sharing the child's day with the family and packing up the environment. These educators work with fellow team members throughout the day to provide quality ECEC for the children. Thus, it is the whole team that impacts the provision of high-quality ECEC not just the ECTs. The research presented in this study includes the perspectives of educators both trained teachers and those with Diplomas or Certificates of ECEC.

Governance and management of LDC centers

The governance and management structure supports educators to achieve the common goals outlined in the philosophy of the LDC center. Specifically, working effectively as a team requires staff to work professionally together on a shared goal, which in the case of this study, was the provision of high-quality ECEC. The NQS (Australian Children's Education and Quality Authority (ACECQA), 2023) stresses the importance of the ECEC team having a shared vision guided by the LDC center's philosophy so that all educators will own the philosophy and be committed and willing to enact it in their service's practices. Australian Children's Education and Quality Authority (ACECQA) (2023) explain in the NQS, QA7, that the ECEC service's philosophy statement has three purposes being that the philosophy:

1. *"underpins the decisions, policies and daily practices of the service;*
2. *reflects a shared understanding of the role of the service among staff, children, families and the community; and*
3. *guides educators' pedagogy, planning and practice when delivering the educational program"* (p. 282).

Quality Area 4.2 of the NQS clearly delineates that professionalism is achieved when staff operate in a team which in turn contributes to quality ECEC. As stated in the NQS (Australian Children's Education and Quality Authority (ACECQA), 2023):

> *"When adults communicate effectively and respectfully with each other they promote a positive and calm atmosphere at the service, supporting children to feel safe and secure and contributing to the development of positive relationships between children and educators. Unresolved and poorly managed conflict between adults in the service affects morale and impacts on the provision of quality education and care to children (p. 215)."*

So that provision of high-quality ECEC is possible, the ECEC service's management structure is required to support the educators' work. Not-for-profit, community-based services have been found to demonstrate higher levels of quality than for-profit services and corporate services (Cleveland and Krashinsky, 2009; Australian Children's Education Quality Authority (ACECQA), 2022; Harrison et al., 2023) which may suggest that these management structures have higher qualified staff, better staff-to-child ratios, and/or stronger staff retention. A service's governance and management structure may influence staff wellbeing and retention, because of work conditions, including wages, and paid time away from children for programming (Fenech et al., 2021). Research shows that children's outcomes are better achieved in services with lower staff turnover rates, and better working conditions owing to the impact upon staff wellbeing (Logan et al., 2020). Additionally, the wellbeing of ECEC educators has been found to impact the learning environment for children, with wellbeing related to lower staff turnover rates potentially affecting the quality of the educators' professional practices (Irvine et al., 2016; Bonetti and Brown, 2018; Organisation for Economic Cooperative Development (OECD), 2018). If educators do not feel that their vision for provision of high-quality ECEC is shared in their workplace, then this is likely to impact the educators' wellbeing, and the subsequent provision of quality ECEC for children will be impeded (Logan et al., 2020). Therefore, the management structures need to be such that staff feel supported.

Overall, research studies acknowledge that outcomes for children are likely to be an interplay of the structural, process and less tangible characteristics of quality ECEC (Press and Harrison, 2012; Bonetti and Brown, 2018). The intent of the A&R process is to determine the quality of ECEC by capturing the interplay of these features, but little is known about the characteristics of the LDC center's provision of high-quality ECEC from the educators' perspectives. This study presents findings from a study that investigated the characteristics of five LDC centers from the educators' perspectives that achieved a high-quality rating of Exceeding the NQS under the A&R process of the NQS.

Research aims and theoretical framework

This study reports on the characteristics of five LDC centers that had achieved an Exceeding the NQS rating from the educators' perspectives who worked in each center. Bronfenbrenner's ecological system theory (1974) was chosen as the theoretical framework for this research as it aligned with the research aims and the research approach. This theoretical approach brings a contextual basis to understanding each LDC's service, within a system that is strongly influenced by the educators, families, and community within that context, set amidst the regulatory requirements for operating a LDC within Australia (see Figure 1).

For this study, the early childhood educators are at the center of the Bronfenbrenner model as they are the key players who make the decisions to enact ECEC. The educators bring to their work in the LDC center their beliefs about the provision of quality ECEC, their own dispositions, qualifications, and experience, and their socio-cultural background. Around the educator is the
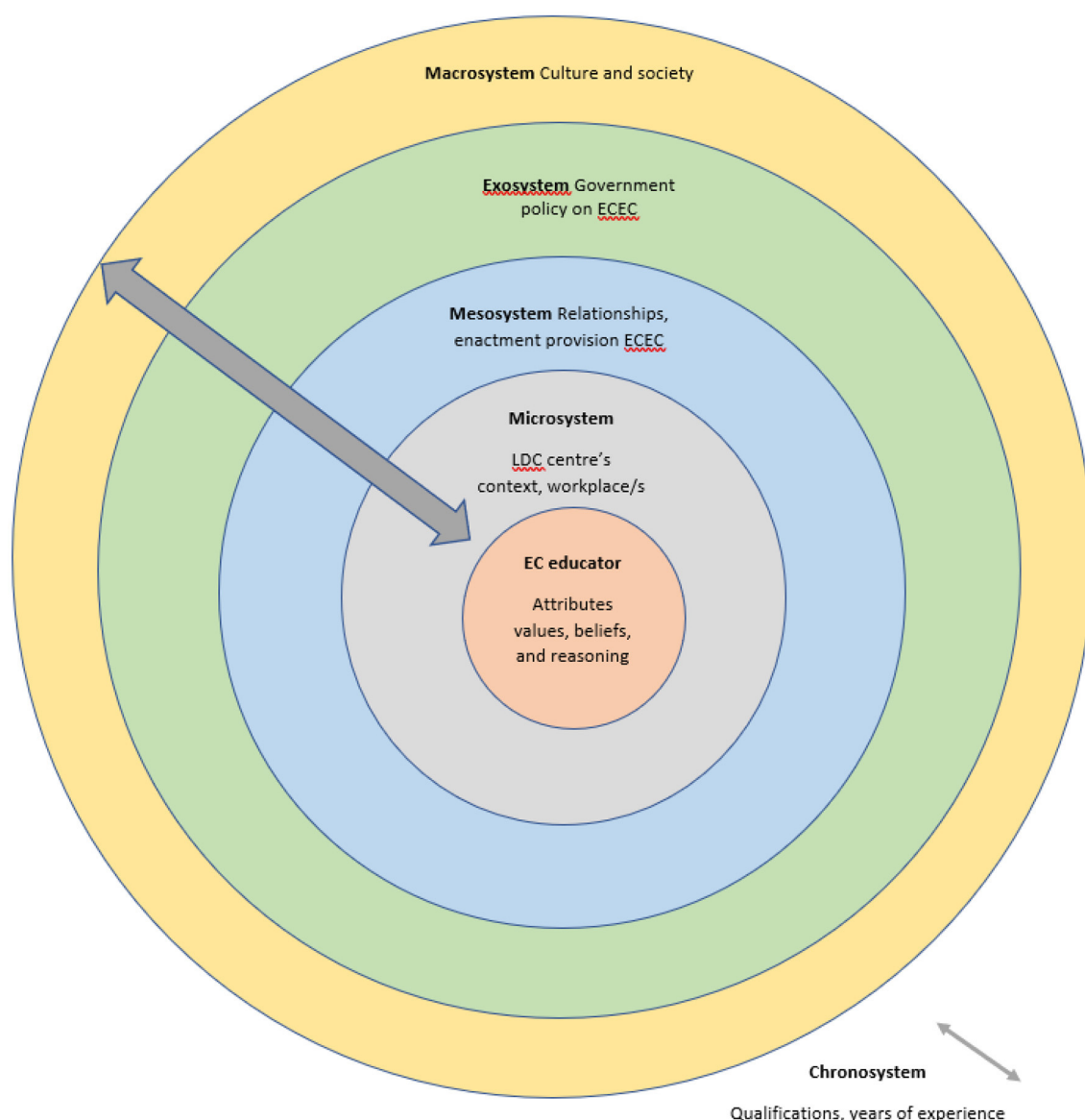
FIGURE 1
Ecological systems of educators in ECEC centers (adapted from Bronfenbrenner, 1974).

mesosystem representing the relationships within the LDC context with the children, colleagues, families, service governance, and local community. The mesosystem is where educators influence and are influenced by children through the relationships they enact; where educators can influence and are influenced by each other as they work together implementing the center philosophy; and where educators and families cooperate together for optimal children's learning and development. Relationships are bi-directional where each person within the microsystem can impact another person's learning and perspectives and are influenced by the interplay with management.

The exosystem is comprised of the context of the LDC center—for example, the community in which the service operates, the families in the local community, and the rural, remote, or urban context. The macrosystem is comprised of ACECQA, which includes the national regulations, the

national quality framework, and associated national quality standard; and the culture and customs of the society. These systems are never static, represented by the chronosystem, with ongoing changes being experienced within the system—for example, changes in staff, management/ownership of the LDC center, legislation.

Methodology

Procedure and participant selection

The study adopted a qualitative approach to investigate the characteristics of LDC centers that were rated as Exceeding the NQS, from the perspectives of the early childhood educators. Five LDC centers were purposively chosen from ACECQA's National

Register. The LDC centers invited to participate represented services across jurisdictions that had met Exceeding the NQS rating. As previously mentioned, in the context of this study, Exceeding the NQS rating is regarded as being high-quality ECEC. This research was interested in LDC centers that were assessed as Exceeding the NQS rating.

Overall, 15 educators were recruited from the five LDC centers that achieved an Exceeding the NQS rating. The LC centers were located in four Australian jurisdictions and had different contexts and philosophical backgrounds. Table 1 illustrates the five LDC centers' different characteristics and the participants' qualifications, experience, and position at the time of the study.

After the recruitment process was finalized, the Director of each center was emailed an initial questionnaire to complete about the center's operation, governance, management, enrolments, and staff-to-child ratios. The participants were also emailed a questionnaire that asked questions relating to their age, experience in ECEC and the LDC center, their qualifications, and their role in the center. Questionnaires were completed before the interview so that the researcher had prior knowledge of the center and participants. The 15 educators were interviewed following ethics approval (approval number 2014/381). Pseudonyms have been used for all LDC center names and their educators. This article presents findings from a doctoral study of the lead author, Phillips (2020).

Semi-structured interviews were deemed to be the most appropriate data collection method to obtain deep insights of the participants' perspectives of what they believed were their LDC center's characteristics which led to the Exceeding the NQS rating. The interviews enabled the educators to use their own language and to report on a range of experiences (Leavy, 2017). Each participant was interviewed once, face to face, at their LDC center, at a mutually convenient time in a quiet space. Most interviews were approximately 30 min, were audio recorded, and then transcribed.

Interview questions

The semi-structured interviews focussed on how the educators prepared for the A&R process; how they felt about the feedback from the authorized officer; the characteristics of the LDC center that contributed to achieving an Exceeding the NQS rating.

Analysis of data

Interview transcripts were analyzed applying Braun and Clark (2006) guide to thematic analysis which has six phases:

Familiarization of the data
At the first phase, interview data were transcribed and then read and re-read until they were completely immersed in the data. Interesting points and initial ideas were noted.

Generating initial codes from the data
At this stage, codes were developed inductively from the interview data, meaning without attempting to fit into an existing code frame. Meaningful extracts relevant to the research aim were highlighted on the interview transcripts in a word document and given an initial code name. Initial code names were collated into a list of codes, and definitions were developed for each code.

Searching for themes
The third phase of analysis involved the identification of themes and collecting all relevant codes within each theme. Themes were developed inductively in the first instance. Second, themes were developed deductively using the reviewed literature and Bronfenbrenner's ecological system theory (1974) as a lens. The code cards were then organized into deductive theme piles.

Reviewing themes
This stage involved reviewing all coded data extracts. All coded extracts were printed and compiled into their relevant theme. The theme document was read and re-read to ensure that the theme formed a coherent pattern. Some codes were added to themes that were not considered to fit in the first stages of analysis emerging, and some codes that appeared not to fit well were removed or applied to other themes.

Defining and naming themes
Each final theme was given a definition. Theme names and definitions were cross checked between researchers.

Reporting findings

As the research aimed to investigate educators' perspectives of their LDC center's high-quality characteristics, seven themes were defined from the data as follows:

1. Educators' characteristics.
2. Relationships within the LDC center.
3. Teamwork and leadership.
4. Financial status and investment in high-quality ECEC.
5. The LDC center's governance and associated work conditions.
6. Understanding and preparing for the A&R process.
7. The interconnection between quality characteristics.

Findings

Each of the seven themes cites excerpts from the participants' interviews. A discussion of the theme, with supporting quotes, is presented in the following section.

Theme 1: educator characteristics
Across each LDC center, the characteristics, dispositions, and skills of the educators were raised as key for the provision of high-quality ECEC. Every educator identified that staff were the key asset to obtain the Exceeding the NQS rating. Effective communication skills, honesty, professionalism, passion, respect, flexibility, ethics,

TABLE 1 Center characteristics and participant information.

LDC center pseudonym	State	Service type and location	Characteristics of the service and Center philosophy focus	Participants' pseudonym, qualification and role	Years' experience in ECEC (at center)
Sure steps children's center	Urban, NSW	Privately owned, for-profit	Inclusive, multicultural, cultural and linguistic diversity	Magda (BEd EC) Owner and Director of the center; Educational Leader; Room Leader of the 4- to 5-year room	28 (16)
				Edna (Third year of completing BEd EC) Educator in the 4- to 5-year room	5 (5)
The terrace early learning center	Regional NSW	Council owned, not-for-profit	Sustainability, Reggio Emilia, children are capable and resourceful contributors to their own learning	Linda (Dip) Educator in the 18-month to 2-year room	15 (11)
				Edwina (Final year of completing BEd EC) Room Leader of the 4- to 5-year room	15 (1.5)
				Katie (Cert III) Educator in the 4- to 5-year room	19 (19)
				Louise (MTeach) Room Leader of the 2- to 3-year room	34 (34)
Figtree children's center	QLD, urban	Privately owned, for-profit	Technology, people not paper, online learning system	Rosie (Dip) Room Leader of the 2- to 3-year room	16 (7)
				Megan (Dip and last year of BEd EC) Educator in the 2- to 3-year room	13 (8)
Possums' learning center	VIC, urban	Council owned, not-for-profit	Home-like setting, natural environment, families, community, use of recycled materials	Mandy (Dip) Room Leader in the birth to 2-year room	25 (7)
				Tanya (Final year of completing BEd EC) Educational Leader	9 (2)
				Toni (Dip) Educator in the 3- to 5-year room	8 (8)
				Vivi (Dip) Center Director/Coordinator and Educator	19 (8)
Children's central learning center	NT, regional	Community-based, not-for-profit	Home-like, embodies town's characteristics; environment sustainable practices, partnerships, respect and communication	Serena (Dip) Center Director and Educator	20 (15)
				Indigo (Dip) Room Leader in the two to three age room	4 (2)
				Anna (Dip) Room Leader in the 3- to 5-year room	9 (5)

Qualifications: Early Childhood Teacher, BEd EC, or MTeach; Dip, Diploma of ECEC; Cert III, Certificate III of ECEC (or equivalent).

and having knowledge and confidence in one's role were perceived as vital educator attributes. Furthermore, the data revealed that an important educator characteristic was an intrinsic and shared drive for high-quality ECEC. This theme is broken down into three sub-themes of educators being reflective, flexible, and ethical; educators being effective communicators; and educators being knowledgeable and committed to the ECEC center's context. These themes are now presented with supporting data.

i) Educator professional qualities of being reflective, flexible, and ethical were raised as being important in the interviews. Linda explained that an educator needs to be passionate and focussed on provision of quality ECEC as well as being a reflective and an ongoing learner was important:

> "Most of the people I think about who are great educators I think passion is a big part of it, having a real passion for it, but also that ability to reflect and to be humble enough to say I don't know everything and in fact there are some things that I don't know very well at all. But I can learn from the children and it's about being a learner as well as a teacher. The more we learn the more you know what you don't know."

Building on this theme of engaging in ongoing learning, Katie explained that she thought teachers needed to be able to change and assess the culture and the context of the LDC center they work in, as she explained:

"Teachers (need to be) prepared to change…You know you can have a teacher who has their degree and got it 30 years ago but there has been a lot of change in ECEC and the way it is approached now compared to 30 years ago has changed so much in that time. So to me a really good teacher is somebody that is able to look at that change and approach it. Also, a teacher that is able to look with open eyes at the culture and context and how they see themselves within not just the center but the community."

The need to be an ethical educator was raised by Magda. Magda explained how prior to change in the NQS the LDC center was assessed by families, and the LDC center sent a questionnaire to families to complete. If the educators were unethical, this documentation could be fabricated as Magda stated:

"I thought that the families and community part of things was interesting. They (the assessor) receive this information via us because you can't really observe it. So, if I wanted to make it up, I suppose I could…. I mean let's face it in any system if someone wants to be unscrupulous, unethical they can."

Overall, the need to be confident in your role as an educator was a characteristic that was raised. Being confident meant that you knew what you were doing and knew how to do it professionally and to work alongside your colleagues. Tanya explained that:

"Being confident in what you are doing (is important) but to be confident you have to have good relationships with staff and families and children. That helps you to be confident as an educator."

ii) Effective communication: The following quotes identify the key attribute of being an effective communicator. Linda explained that:

"We have very honest relationships with families…. with open communication both verbal and written…..You need to be nurturing and have a caring nature and understanding, listening to the children, and what their interests are."

Indigo, speaking generally, identified that being empathetic and open-minded was important:

"…being able to take another person's perspective is important, being open-minded…always striving to learn, ongoing learning a good observer… and giving time to children"

Being respectful, understanding, and passionate about the work of an educator was raised as a characteristic by Toni, with other qualities included by Toni as being:

"respectful of the children's needs and wants and understand that what we are doing here is about education and learning not just about babysitting so it is that balance of having that warmth and nurturing but also providing a rich play-based learning environment also working with parents quite closely to make sure all needs are being met."

Finally, listening was a key skill to being an effective communicator. As Katie explained:

"Listening is a big skill. Listening to families, listening to the children, listening to staff and what they are actually saying. And I don't mean listening on a superficial level, I mean really listening to what they are saying and understanding what they are saying."

iii) Knowledge of, and commitment to, the LDC center's context: The educators spoke about how they ensured that the educators were committed to the LDC center philosophy and had an in-depth knowledge of the children, families, and LDC context. Representative of this process across each of the five LDC centers is Edna's comment as she explained:

"We had one whole center staff meeting which focused mainly on our philosophy which is where we started the whole process was really getting back to the basics of what is our philosophy, what is important to us in our service and caring for our children and what kind of place do we want to be and then we sort of used that as a bit of a framework really for reflecting on what we are doing, so this is what we want, this is what we hope we are, and if is this actually happening within our daily practice with children and so we used that to reflect on our practice."

Theme 2: relationships within the LDC center

Essential characteristics of the LDC center achieving an Exceeding the NQS rating were the presence of strong and respectful relationships within the LDC center. The educators explained how their respective centers practiced relationships with children, families, and each other and that this characterized their center's provision of high-quality ECEC. The educators highlighted how the depth of these relationships that indicated "a sense of unity" was the most important characteristic within the LDC center.

Educators, children, and families were viewed as equal participants who had a united approach to the provision of high-quality ECEC. Ten educators identified how the staff had knowledge of each child and their family. Families continued to return to their LDC center with each child in the family, which exemplified how important relationships were between educators and families. Rosie explained that "you build such a big relationship with the parents and the children… they respect you and you develop a friendship with them."

While the educators all indicated that relationships in their LDC center were an important characteristic of high-quality ECEC, differences existed within the relationships in each center

highlighting that ECEC quality is contextually bound. For example, Linda explained that "staff here are all connected to the children" and "we have very honest relationships with families," while Indigo stated that:

> "Educators take pride to address the family and they know what is happening with individual families. We know when new siblings are born, the pup is at home, the cat is dying, families are moving... So that is personalized. Parents are their first educators and extend it to here (the service). I think looking at the center as an extension to what is done at home and marrying it to all families."

The educators indicated that staff collaborated to prepare for the A&R process highlighting the need for respectful and effective collegial relationships within these LDC centers. Rosie put it like this:

> "You have got to work together, and you can't be an individual working, you have just got to work together,"

while Indigo explained there were a lot of different areas in which the staff collaborated:

> "...having those meetings, looking at the different standards and elements, ticking them off, making comments and basically collaborating together. That is basically what got us Exceeding."

A sense of unity indicated alignment to the LDC center's philosophy as educators explained that they were "all on the same page"—a direct quote heard from three of the 15 educators. Educators expressed awareness of the need to "be on the same page" to provide consistent education and care across the LDC center. The following responses highlight this finding. Megan stated that

> "The staff work well together there is none of this kind of split and divide. We all support each other. We all have reflections together ... we all seem to be on the same page and we all have a similar kind of philosophy and goals."

Similarly, Toni explained:

> "Well, I think that all of us, not just me, that we really try and work together and that we try and listen to each other's opinions and that everyone gets a voice and discusses what is happening and why we are doing things the way that we do."

Serena identified that educators may have different values but need to work together and align with the LDC center philosophy:

> "We had a training session where (we were) talking about what we think our center's values are, you know because we all have different values and we have to think about where we all sit and if you are working in a center you have to believe in their philosophy and their values, or otherwise it is not going to work."

Similarly, Vivi explained that

> "For our center it is everyone being on the same page in a philosophical way because we do a lot on our philosophy, and I think it becomes very apparent if someone is not on that page.... A really good educator here will stand out because they fit in with our philosophy and it is consistent across all our rooms. You know you don't have one room working in one way and another room doing it another way; there sort of is a flow."

Theme 3: teamwork and leadership

Following on from the importance that the educators identified the need for effective collaboration with colleagues, a key finding from the study was that teamwork and leadership were perceived as a significant characteristic of each LDC center for provision of high-quality ECEC. Educators at each LDC center identified that a collective approach to leadership, rather than having one identified leader, was important.

There were strong similarities across the five LDC centers regarding the way leadership was exercised: Each center had an educational leader and/or director responsible for implementing the center's philosophy, collaborating with staff on the QIP, and creating and supporting staff to implement consistent approaches to the center's philosophy. The educators talked about sharing roles and responsibilities, having a strong commitment to providing high-quality ECEC, with all educators' ideas valued. The team commitment to provision of high-quality ECEC was highlighted by Edna who stated:

> "It's really wanting to provide the best early childhood service that we can and similarly making sure that the staff have that same kind of pride in their work. When staff have that pride they want their service to be recognized as a good service. It's a lot to do with their attitude toward work."

Similarly, the director of Edna's center, Magda, highlighted how she managed ensuring each educator's voice, and their views were heard. Magda stressed how all staff made significant contributions—it was not just up to one staff member to lead but rather required teamwork, which as the leader was challenging:

> "Every single member of our team contributed. But what then happens is that, for example, if you have 15 voices it's like a cacophony. So, I had to listen to and read each one of those voices...it looks like it is discordant but actually you're both coming from a different angle but not in conflict at all they are just coming at it from a different perspective. So that was a really difficult thing."

Magda explained that having a shared commitment was key to the provision of high-quality ECEC as she stated:

> "I think it comes back to the philosophy. I believe it becomes an amazing resource, I believe if there is not enough shared commitment and enough of a pool of shared values that becomes your philosophy then you are just pulling in different directions. You will know. You walk in to some places and you can feel that it

is discordant, people are working hard in each separate room but there isn't a shared vision or a sense of something that is uniform and a thread that goes through."

This process of addressing discordant views, but ensuring they were represented, was echoed at The Terrace Learning Center by Katie who stated:

> *"At times it has been challenging and confronting but I think that's brought out what we have needed to bring out. And yes, sometimes it has made some staff feel uncomfortable but I feel that because of our honesty, I feel like we have been able to nut through things, and the situations that have come up where we have needed to sit down and talk about it. I feel we have been good at that."*

Educators talked about sharing roles, feeling confident in their role, and being valued. The Terrace Learning Center team focussed upon how they demonstrated advocacy leadership through sustainable practices, showcasing them to the community, to improve the conditions of the environment for a sustainable future. The process of working together as a team presented challenges for the educators including the leaders; however, it was this characteristic of the LDC center's operation that the educators perceived was important for obtaining the Exceeding the NQS rating.

Theme 4: financial status and investment in high-quality ECEC

Investing financially in the LDC center and in staff capacity was perceived as a key characteristic of the provision of high-quality ECEC. Ongoing improvement was addressed by investing in obtaining, improving, and retaining the knowledge, skills, and resources needed for provision of high-quality ECEC. Explicit strategies were adopted to build financial capacity including applying for grants. Serena was noted by her staff for her grant writing ability, and success just prior to the interview, in obtaining a "large grant of $103,000 for equipment," "new toys," and "improvements to the outdoor area," including "a bush tucker area." Indigo, who was from the same center as Serena, had a strong interest in the environment as the third teacher and was allocated funding for improvement of Quality Area 3, the physical environment. She believed the environment was important for the provision of high-quality ECEC.

Four of the five LDC centers indicated that they aimed to provide financial capability for provision of high-quality ECEC, with Sure Steps Early Learning Center being the exception. The director of Sure Steps, Magda, did not demonstrate evidence of building financial capacity to improve service quality; however, she explained that having strong financial capacity was a very important major characteristic of high-quality ECEC, as she said

> *"if we are working on the premise that qualifications equals quality, (and) services who have the resources… the money, [and] can afford attractive working conditions are going to be able to have their pick and choose theoretically the best educators."*

This finding poses interesting questions for provision of high-quality ECEC in areas where funds are not readily available from the LDC center's management to invest in the center's capacity. The educators at each LDC center explained that the management of their center provided professional development opportunities for all staff- thus making a strong investment in staff capability. Training opportunities were deemed to have had significant impact on the provision of ECEC quality. At Possums Learning Center, all four educators interviewed spoke of the impact of attending a professional development day that they believed contributed to the LDC center's Exceeding the NQS rating. Vivi, the director, identified staff relationships and communication as requiring improvement and had organized an external professional expert to deliver staff relationship training. Mandy, one of the educators at Possums Learning Center explained that:

> *"(The professional learning day) was a huge turning point for staff. The in-service was about being assertive but in a very respectful way, eliminating the gossip… It taught [us to] just to go straight ahead and speak to the person that you need to speak to, and I think as soon as we did that… it opened up the ways for all of us to really communicate… Look I couldn't be happier. We literally just leapt and bounded ahead."*

Here, we see that the director identified the need for staff to address how they worked together as a team and communicated with each other, and thus, the professional learning day made a strong contribution to the staff capacity and skills. Quality Area 4 of the NQS has a focus upon:

> *"professional and collaborative relationships between management, educators and staff support continuous improvement, leading to improved learning experiences and outcomes for children (Australian Children's Education and Quality Authority (ACECQA), 2023, p. 202)"*

which was evident in the approach undertaken by Possums Learning Center and is a key characteristic of Exceeding the NQS rating for this LDC center.

Theme 5: the LDC center's governance and associated work conditions

The data revealed that the LDC center's governance and management structure was found to be a key characteristic that educators identified in the provision of high-quality ECEC. As signaled in Table 1, there were various models of service governance and management structures across the five LDC Centers. The models of governance were identified in the initial questionnaire to directors and in interviews with the participants in the five LDC centers as shown in Table 2.

Educators' work conditions varied across the five LDC centers. The initial director questionnaire and interview data revealed that there was one LDC center who paid above award conditions, three LDC centers that had above the required staff-to-child ratios, and all LDC centers provided flexible work conditions for their staff (see Table 3. Educators in these LDC centers identified these

TABLE 2 LDC center governance and management structure.

LDC center	Governance and management structure
Sure steps early learning center	Privately owned, managed by Director, Magda, for-profit
The terrace early learning center	Community-based, governed by local council, not-for-profit
Figtree early learning center	Privately owned, for-profit
Possums early learning center	Community-based, governed by council, parent management committee and director (Vivi), not-for-profit
Children's central learning center	Governed by city council with a parent committee and center director (Serena) not-for-profit

TABLE 3 Work conditions across LDC services.

LDC center	Above award conditions such as staff wages and programming time	Above required educator-child ratios	Flexible staff working arrangements
Sure steps early learning center		✓	✓
The terrace early learning center		✓	✓
Figtree early learning center			✓
Possums early learning center	✓	✓	✓
Children's central learning center			✓

particular working conditions as an important characteristic of high-quality ECEC.

The LDC center that provided all three "higher than required work conditions" was Possums Early Learning Center, a council-operated center. Vivi, the director, believed that educators provided with above award conditions provided a positive work environment as they feel valued and are "satisfied" with their job; they are also "highly motivated" and have "stronger relationships" within the LDC center. The governance and management of the center contributed to these above award work conditions as she said that having "a supportive parent run committee" who offer "above award conditions" on "staff wages," "staff-child ratios," and "programming time" resulted in the center's "happy and stable team with many staff being employed for 5–10 plus years at the center."

Another council-operated LDC center, The Terrace Early Learning Center, also identified educator-child ratios above what was required in the regulations, which enabled educators to build strong relationships with children and their families. Offering staff flexible work arrangements was a characteristic of all LDC centers suggesting that having a positive working environment promoted provision of high-quality ECEC. For example, Toni from Possums Early learning Center said:

> "Management promote flexible work arrangements, taking into account staff family commitments, health issues and study commitments."

Anna from Children's Central Learning Center indicated that

> "I've had some health problems recently and you know if I said to [the director] right now "my doctors rang and I need to go," she would let me… and since I have been having problems

with my throat she is going to move me to the babies room so I don't have to strain my voice as much… She is a very good director."

These examples validate that the educators' home/work/life balance supports their wellbeing to contribute to the provision of high-quality ECEC. This is an important finding building on the previous findings that educators' attributes and capabilities were identified as important characteristics of high-quality ECEC.

Theme 6: understanding and preparing for the A&R process

It was clear from the interviews with the educators that having an understanding of the A&R process was considered essential. This theme speaks to the need for effective staff relationships, teamwork, and leadership that ensures all staff are united in their approach to provision of high-quality ECEC. Once educators were all on the same page; then, strategies for preparation for the A&R process were reported in all LDC centers. Educators talked about the meetings they were required to attend—some meetings were room meetings of all the staff who worked in that room; other meetings were whole of center meetings led by the director and/or the educational leader. At the many meetings held, the seven Quality Areas (QAs) of the NQS were discussed, identifying QAs where the staff of the LDC center felt that they were practicing at the Exceeding level and those that required improvement to obtain the Exceeding the NQS rating. This was identified in a variety of ways either led by the center's leaders, or as a collaborative process by all staff. The director led this process in Megan's center:

"Well the director pretty well did it but we were just told the areas that needed improving and we had access to it so that we could look and read any observations on the areas that we needed improving, read the plan and read the programs that were put in place to improve overall."

In Anna's LDC center, the process was reported as being collaborative:

"It (preparation) obviously started in meetings. We would get together and we would look through each quality area. We used to come up with our strengths and our weaknesses that we wanted to work toward and so everyone would come up with them and we did find at the beginning that lots of stuff came out - we were sort of inundated actually with not so much of our weaknesses we were actually quite proud of our strengths. So, it was a very reflective process, even though I am sure for (leaders) it was quite a lengthy process but we as hands-on-staff felt like it was a really good process for us."

For some staff, for whom it was a new process, the leaders assisted them to develop understanding of the process, as Serena stated:

"We came together to talk about what we hoped to achieve through this process because some (staff) hadn't been through the process before. So it was basically a new learning experience for them. So it was having a look and thinking now what are they doing? What would they like to do? What do they see as the gaps and we talked about each others' rooms as well, because sometimes you can't see what's in your own room. You are too close to it. For parent feedback, we do these surveys and sometimes I think 'why do we do these' but they are really, really good. We have just got the last round back and we do that every time. We ask the parents what they would like."

Anna, a member of Serena's staff, explained that this process was ongoing, with some additional work to prepare for the assessor's visit:

"We invited parents to come in and they were involved in a working bee and we cleaned up the center. We also updated folders and made sure they were up to scratch and ensuring that everything that was needed for the assessment was up on the wall and up to date and easy to access before the visit. Director did a lot of the paper work and we pretty much did the hard labor on the floor. It's an ongoing thing keeping this place running but it is that extra bit of work before the visit. We had the feeling that we were going to get Exceeding so we just had to make sure everything was up to scratch. Most of it was done anyway but it was trying to keep up with it."

Some educators found the process provoked anxiety and stress, and others were quite relaxed about the process. Magda said:

"We were fairly anxious because it was a new process and therefore there was no feedback, and we were also very aware that Department of Education and Communities (staff) themselves were learning on the job as well. So there was no one to go by, you know now that we have been through it we can tell other services what it was like but we had no one to listen to."

While Tanya stated:

"Assessment wasn't really nerve wrecking- it was an opportunity for us to review and reflect on our practice."

There was agreement among the educators that being prepared was very important as highlighted by Magda who said:

"Being prepared at the very base line meant having everything that they require. If you don't have that and you have had time and you know that that is what they want at the very base line then you would be crazy and to have not done your homework that way. There is reflecting and summarizing where you are at now and then looking at what we are great at what we are not so great at and then thinking well how do we want to improve? And then how do we prioritize because you have this long list and that list could last you two years. So then you have to say well ok which ones are really important and why, and which ones are achievable, and which ones do we start now, and which ones are going to be long term."

The educators identified that the preparation was part of ongoing improvement of practice as part of the operation of a LDC center, with adjustments required as new staff come on board, as Tanya stated:

"… the work is already done on a day-to-day basis so it is just a reflection on what we were doing already;"

Vivi said

"I think it is just constant improvement overall but I think it is about not getting to a point where you think well Ok we got Exceeding we will look at that in another three years' time … it changes all the time.…it changes with the staffing team as well. Like this year we have quite a few new staff that weren't here last year and so the things that we feel we do really well in a lot of ways have changed and the things that we need to improve on have changed because it is different people."

Theme 7: the interconnection between LDC center characteristics

An important theme that emerged from the data was that the LDC's characteristics were interconnected to be rated as Exceeding the NQS rating and providing high-quality ECEC. The LDC centers operated holistically, addressing all seven quality areas of the NQS. Vivi, from Possums Early Learning Center, asserted that "I don't think quality can be seen in separate areas." The educators spoke of the attributes of their fellow educators, the teamwork and leadership in their LDC center, the governance and management's influence upon the provision of ECEC quality, and the need for all educators to be invested in provision of high-quality ECEC by being

united, 'on the same page' and to be prepared for the A&R process. The educators spoke about how being committed to provision of high-quality ECEC, with their effective communication skills, assisted to build relationships and partnerships with the children and families within the LDC center's context. What the educators bring to their work needs to be supported by governance and management that support the staff's work conditions, wellbeing, and investment in ongoing professional development.

Discussion and conclusion

This study investigated the characteristics of five Australian LDC centers that had been rated as Exceeding the NQS rating, considered equivalent to the provision of high-quality ECEC, from the perspectives of 15 educators who worked in those LDC centers. The findings indicate that, overall, the LDC centers' characteristics were interconnected and that educators need to have the common goal of provision of high-quality ECEC. The need for all educators to be committed to this common goal was evident in each LDC center. The educators' qualities and the operation of the LDC center's leadership and teamwork were necessary requirements to guide the LDC center's provision of high-quality ECEC.

Using the ecological systems model of Bronfenbrenner (1974) as the theoretical framework, the microsystem of the educator's attributes and characteristics was perceived to influence the provision of high-quality ECEC. The educators identified three educator qualities necessary to achieve the Exceeding the NQS rating. These qualities were being reflective, flexible and ethical practitioners; effective communication; and knowledge of and commitment to the LDC center's context. These educator attributes enabled teamwork to be undertaken leading to shared understanding of practices and provision of high-quality ECEC. This finding aligns with past literature, and educators were viewed as needing to be effective communicators (McMahon, 2017), honest, trustworthy, passionate, engaging in ongoing learning, respectful, professional (Cleveland and Krashinsky, 2005), flexible, and ethical with expert knowledge (Goodfellow, 2003).

The second theme identified, that aligns with Bronfenbrenner (1974) mesosytem, is that the educators reported that they purposively developed and nurtured relationships between educators and children, between educators and families, and between educators and educators. The ongoing practice of these relationships was highlighted as a key characteristic of each LDC center and why the center was assessed as Exceeding the NQS rating. This aligns with the literature that links positive educator relationships with children (Goodfellow, 2003; Connor et al., 2005; Tayler et al., 2016); solid partnerships between educators and families (Organisation for Economic and Cooperative Development (OECD), 2012); and collaborative staff relationships (Fenech et al., 2021), with high-quality ECEC. These relationships enabled teamwork to be undertaken leading to shared understanding of practices and provision of high-quality ECEC. For teamwork to be successful, the relationships between the educators within each center were important for Exceeding the NQS rating.

Working as a team was deemed to be an essential characteristic for the LDC center to be assessed as Exceeding the NQS rating.

Each center identified that they needed to have all educators implementing the center's philosophy and working consistently and have the common goal of provision of high-quality ECEC. The leaders were responsible for pulling the team together and ensuring that addressing conflicting views were discussed and resolved. This finding aligns with the notion that leadership is a collective process with everyone benefiting by exercising power and agency (Siraj and Hallet, 2013). The finding that the LDC center's philosophy is foundational to leadership and teamwork is a concern, as in Australia there is no ongoing provision of leadership support (Gibbs, 2020).

The educators who were in formalized leadership roles were committed to the responsibility of their role, which in turn supported teamwork to occur in the LDC centers. Educators in the LDC centers reported that they took a collaborative approach to leadership as Vivi articulated: "For our center it is everyone being on the same page in a philosophical way." But this did not mean it was an easy task, as all educators had diverse expertise, experience, and qualifications, as Katie identified "Every single member of our team contributed. But what then happens is that, for example, if you have 15 voices it's like a cacophony." This aligns with the literature by Delice et al. (2019) highlighting the significance of the leaders' roles to ensure all educators make contributions that are valued and discussed so that the common shared goal is achieved.

The leaders were responsible for not only determining areas that needed to be strengthened, but also to ensure that all educators worked collectively, which ultimately led to everyone benefiting as the LDC centers reached the common goal of Exceeding the NQS rating. Within this macrosystem (Bronfenbrenner, 1974), the leaders exercised power and agency (Siraj and Hallet, 2013) and enabled the team of educators to identify similarities and differences, reflect upon them, and enact the provision of high-quality ECEC. Having supportive leadership is foundational for the provision of high-quality ECEC. This finding has implications for ensuring that the educational leaders in ECEC services have the expertise to lead and resolve conflict with teams to work toward common goals. If the staff lack this expertise, it may be difficult to provide high-quality ECEC. Staff may have studied leadership and teamwork in their study for their qualification, or they may need to attend professional learning to ensure they have these skills. Significant investment in staff's professional development is important for providing high-quality ECEC.

While financial investment in high-quality ECEC is not directly explicit in the NQS, however, it was recognized by the educators in the study that if funds are available for professional development, then the LDC center will benefit in the provision of high-quality ECEC. This has implications for ensuring that educators have skills to write grants; to identify areas to strengthen staff knowledge; and to manage funds. This has implications for the management to ensure investment in the staff and LDC center is ongoing to target provision of high-quality ECEC. For-profit LDC center, providers are less likely to achieve an Exceeding the NQS rating (Harrison et al., 2023); then, to offer children learning environments where they thrive, LDC centers' governance and management may need to be provided with incentives to invest in the educators as they are considered to be an important asset of the LDC center.

Supportive governance and management that provided staff with flexible working arrangements, above award work conditions, and above ratio requirements was found to be a significant characteristic of high-quality ECEC in line with literature (Bonetti and Brown, 2018). The directors worked closely with the LDC center management to provide educators with work conditions that would support educators' wellbeing and capacity, as has been identified by Logan et al. (2020). The LDC educators reported that their LDC centers had built financial and staff capacity to achieve an Exceeding the NQS rating. This finding aligns with previous research that not-for-profit, community-based services generally demonstrated higher levels of quality than for-profit services as they were more likely to invest in high-quality ECEC (Cleveland and Krashinsky, 2009; Australian Children's Education Quality Authority (ACECQA), 2022).

The staff relationships, their teamwork, and the center leadership actions came to the fore in this study in the sixth finding which highlighted that the A&R process needed to be understood by all educators. The macrosystem (Bronfenbrenner, 1974) of the external assessment process varied for each center; however, all educators were involved in the A&R process preparation in some way, with the directors and educational leaders guiding educators through the reflection of their practices. The preparation was viewed as an essential investment for the A&R process, which is important for the provision of high-quality ECEC, aligning with the subjective nature of quality ECEC (Dahlberg, 2013), and that the common goal for high-quality ECEC is contextually different. The final theme identified that undertaking the A&R process was holistic occurring over time. Bronfenbrenner's ecological system (1974) shows that systems are dynamic, what he termed the chronosystem. The provision of high-quality ECEC is not an end point in itself but a process of ongoing continual reflection and improvement across all areas of ECEC practice.

This study found that making an investment in educators who are effective communicators, are honest, professional, and passionate, and have knowledge and confidence in one's role is highly recommended for provision of high-quality ECEC in LDC centers. Teamwork and leadership that focusses on common goals within a governance and management structure that supports the educators were identified as being the key requirements for Exceeding the NQS rating.

However, it is important to acknowledge the limitations of this study. The views expressed in this study are those of the educators—just one of the key stakeholders in the provision of high-quality ECEC. There were only 15 educators' perspectives reported from five LDC centers as they underwent the A&R process. There was an imbalance of qualifications among the participants, and their views may not be shared by other key stakeholders such as families. The educator is a key decision-maker in determining the practices and outcomes for children's learning and development within a LDC center, and their voices need to be heard as they work within the LDC centers to provide high-quality ECEC. It is recommended that further study be undertaken to provide a broader indication of educators' views.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by University of Sydney Ethics Committee. The patients/participants provided their written informed consent to participate in this study.

Author contributions

This research is from AP's doctoral study. All authors contributed to writing the article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The educational and parenting test for home-based childcare: a socially valid self-rating instrument

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Introduction: Home-based childcare is increasingly becoming the focus of research, policy and public interest. Self-assessment of quality can increase the social validity of quality improvement efforts among stakeholders. A new online self-assessment tool for parents and non-relative providers of home-based childcare is introduced that has been developed in Germany, the Educational and Parenting Test for Home-Based Childcare (EPT; in German: 'Bildungs- und Erziehungstest für TagesElternBetreuung BET').

Methods: In two studies, the social validity of the EPT was investigated: a stakeholder study with 45 parents and 12 non-relative caregivers, and an expert study with nine experts of child pedagogy. The stakeholders rated the EPT survey ($N=57$) and the subsequent report of test results ($n=22$). The experts evaluated the survey and the feedback report based on vignettes of three fictitious test results (i.e., below average, average, and above average quality). Criteria included face validity, measurement quality, controllability (i.e., comprehensiveness), freedom of response, freedom of pressure, counseling quality, usefulness, control of bias, and privacy protection.

Results: Most aspects of social validity achieved good to very good ratings. All three samples graded the EPT survey as "good." If the stakeholders felt that their educational quality was undervalued, they rated the report of test results worse ($r_s(20) = 0.52$, $p = 0.02$). Five of seven experts would recommend the EPT to others.

Discussion: Based on participants' comments, the instrument was thoroughly revised. The EPT is a socially valid instrument for assessing and developing quality in home-based childcare.

KEYWORDS

home-based childcare, self-assessment, stakeholders, quality, parenting, social validity, acceptance, experts

1. Introduction

There is a broad and multidisciplinary consensus on the lifelong importance of the early years in a person's life. Three general aims of research on early childhood education and care (ECEC) are to offer children from all social backgrounds a good start in their lives and educational careers, to support parenting as well as parents' work force and, thereby, to

strengthen the national economy over several generations. Both familial characteristics and features of the providers of childcare are relevant for young children's development (e.g., Watamura et al., 2011). Research both on regular external day care and on special state-wide programs for children at risk have corroborated the positive long-term effects of ECEC on both individual (e.g., child development) and systemic factors (e.g., a nation's economy; Barnett and Hustedt, 2005; Bailey et al., 2021).

Research questions of ECEC studies address amongst others, which types of non-maternal childcare are used with which intensity (e.g., center-based childcare, home-based childcare), which effects do they have on children, families and the society, and which role does the quality of childcare play for individual and systemic outcomes (e.g., NICHD ECCRN, 2002). The present study is dedicated in particular to the following two forms of childcare: (1) home-based childcare provided by day care parents as non-relative caregivers, and (2) maternal or parental childcare. (Non-clinical) behavior problems of young children were sometimes associated with, for example, lower educational quality levels of the external childcare institution (e.g., NICHD ECCRN, 2002; Sylva et al., 2004; Pianta et al., 2009). Core features of childcare givers' quality are the educational activities subsumed as process quality and the existence of an educational concept with defined aims (e.g., Rindermann and Baumeister, 2012; Baumeister et al., 2014). While there is an enormous bulk of studies on formal center-based childcare, hardly any studies on home-based childcare and the subcategories of it (i.e., family/relative/non-relative childcare) exist (Adamson and Brennan, 2016; Blasberg et al., 2019).

1.1. Assessment and development of quality in ECEC

Since the 1980s, variants of basic scales for assessing all aspects of educational quality of different childcare institutions were developed by Thelma Harms, Deborah Cryer, Richard Clifford and colleagues in the United States and translated into several languages. This scale family, known as Environment Rating Scales (ERS), is also used in research and practice in German-speaking countries.

From a scientific view, the advantage of using basic scales worldwide clearly is the possibility of cross-country comparisons of ECEC quality (e.g., Vermeer et al., 2016). A disadvantage of basic scales could emerge if country-specific characteristics of childcare settings are not considered sufficiently. From the practitioners' view, specific childcare settings (e.g., home-base childcare) may require specific conceptual models for their quality assessment not being addressed by basic scales (e.g., the role of the neighborhood; Blasberg et al., 2019).

In Germany, day care parents have a maximum number of five children aged 0–3 years in their care, either in their (i.e., the provider's) private home or in apartments especially rented for this purpose, in contrast to the larger (publicly or privately funded) day-care centers (e.g., kindergartens). In 2021, 16% (i.e., $n = 129.406$) of all German children below age 3 in external childcare attended home-based childcare, a decrease of 4% compared to 2020 (BMFSFJ, 2022). As reasons of this decrease of home-based childcare within the same age group are discussed: demographic changes, a lack of childcare places, and organizational problems of the COVID-19 pandemic.

Since various terms exist in different countries for specific day care arrangements, the following distinctions are used in this article:

In Germany and, therefore, in this article, home-based childcare ("Kindertagespflege") is provided by day care parents ("Tageseltern") in their private homes, whereas family-based childcare is offered by nannies, relatives or au pairs who visit the children in the children's homes. In contrast, in the United States, home-based childcare is an umbrella term, subsuming family, relative and non-relative childcare (Porter et al., 2010), thus ranging from birth to age 12 (Blasberg et al., 2019).

By means of the national German study on early childhood education and care (NUBBEK), the quality of home-based and center-based ECEC is assessed for two-year-old ($n = 1,242$) and four-year-old ($n = 714$) children (Leyendecker et al., 2014). The comprehensive comparison of quality aspects is based on various data sources (observations, interviews, surveys, testing of children). The first data collection wave was conducted from 2010 till 2011 in eight federal lands of Germany, the second wave started in 2021 and is still ongoing. The majority (> 80%) of non-relative caregivers achieved a moderate process quality. For home-based childcare provided by non-relative caregivers, process quality scored on average with 4.0 on a scale from 1 (insufficient) to 7 (excellent; Tietze et al., 2012). Interestingly, the other types of childcare achieved similar quality scores on average, although a large heterogeneity of their characteristics was noted by the NUBBEK research group. For example, home-based caregivers and caregivers of younger children reported of more wellbeing than center-based caregivers and caregivers of older children.

Self-assessments of caregivers increasingly become important for quality improvement efforts. In the past, self-assessments were used to complement external ratings in the context of inspections of day care providers. The acceptability and social validity of quality assessment and improvement methods, however, are contested among some stakeholders, and thus, the sustainability of these quality efforts may be in doubt. Therefore, self-assessment enables caregivers to participate in the process of quality assessment, and it increases the social validity of quality assessment among stakeholders. Social desirability of participants' answers, however, is a challenge for self-assessment instruments. Socially desirable answers can either be prevented, for example, by assuring the participants that the results are confidential. Also, questioning techniques such as the randomized response technique can be applied (Warner, 1965; for limitations and alternatives, see John et al., 2018). Or socially desirable answers can be detected by a specific measure of socially desirable responding. The latter makes it possible, for example, to weight certain answers differently. In the context of national quality frameworks, instruments for self-assessment and improvement of quality are offered to providers (e.g., for Germany: Tietze et al., 2017; for Australia: Hadley et al., 2021).

1.2. The educational and parenting test for home-based childcare EPT

The 'Educational and Parenting Test for Home-Based Childcare EPT' (original German name: ,Bildungs- und Erziehungstest für TagesElternBetreuung BET') is introduced as a new instrument for self-assessment and development of ECEC quality (Baumeister and Rindermann, 2015). The EPT assesses structure, process, orientation and contextual quality of home-based childcare with regard to a

target child aged 0–6 years (Baumeister and Rindermann, 2022). The theoretical quality model of the EPT is based on previous ECCE research (e.g., NICHD ECCRN, 2002). Structural quality aspects are assessed, for example, by asking how the childcare rooms are equipped with various materials for pedagogical activities (e.g., "how many books for children are available?") and whether the safety and hygiene standards are met. Regarding contextual childcare quality, potential risk and protective factors of child development are asked (e.g., parental educational and income level; in which family constellation does the target child live: does it live with both biological parents?). Parenting styles (i.e., authoritative, authoritarian, permissive and negligent parenting) represent one aspect of orientation quality. In particular, the EPT focuses on the quality of the caregiving process, which is assessed (1) by a wide range of items for different daily routines (e.g., providing healthy food, bedtime rituals) and educational activities (e.g., excursions into nature, practice dressing on their own), and (2) by scales for observing the target child's interest in some of these activities. Two versions of the EPT exist as online surveys, namely for non-relative caregivers ('Tageseltern') and for the parents of the target child. The two versions are answered and analyzed independently of each other. It is possible to take the test several times for different target children each time. In its current form, each version of the online survey takes about 20 min, and the items differ according to age of the target child indicated by the caregiver. Consequently, some of the educational activities asked for very young children are different from those asked for 5-year-olds. Potential social desirability of answers is controlled for by using specific indicator items (e.g., "I never get loud when I am upset.") for the response weighting techniques applied in data analysis. At the end of the survey, participants can express their interest in receiving detailed feedback on the quality of their childcare back. This short written report also includes graphic percentile rank scales for visualizing individual results (Groll, 2017).

In contrast to the aforementioned quality rating scales, the EPT has a stronger research focus; it assesses familial characteristics, for example, in more detail. A further difference between classic environment rating scales and the EPT lies in its self-report nature: Whereas classic scales are used by external raters who visit the children's homes or day care centers for inspection, the EPT is a web survey which is answered directly by the parents and day-care nannies themselves. For this purpose, two versions of the EPT were developed addressing the two target groups specifically (Baumeister and Rindermann, 2022). The psychometric properties of the EPT are satisfactory (Baumeister and Rindermann, 2022): the average objectivity corresponds to $r = 0.58$; the average reliability corresponds to Cronbach's $\alpha = 0.61$. Criterion validity was confirmed in the form of correlations of selected process quality items and scales with conceptually similar tasks of the developmental test 'IDS-P' (Grob et al., 2013: e.g., $r(19) = 0.53$ for cognitive tasks; $r(35) = 0.46$ for psychomotor tasks). Convergent validity was shown in the form of correlations of the parenting style items and scales with the conceptually similar questionnaire 'EFB' (Naumann et al., 2010: e.g., $\rho(42) = 0.50$ for authoritarian behaviors; $\rho(42) = 0.38$ for permissive behaviors). In addition, convergent validity was also confirmed with respect to associations between the EPT and the German version of the Leuven Involvement Scale for Young Children LES-K (Laevers et al., 1993). These two instruments assess child involvement (LES-K)

or child interest (EPT) in various educational activities. An average correlation of $r(62) = 0.80$ ($p < 0.01$) was obtained between the EPT and the LES-K for self-ratings and two foreign ratings across several activities (Gosmann, 2017). The psychometric properties of the EPT are constantly being investigated and improved in the context of bachelor's and master's theses recruiting independent samples of caregivers and parents.

It is an open research question how regulated childcare providers differ from parents regarding several aspects of their childcare quality (Porter et al., 2010; Baumeister et al., 2017a,b). The EPT aims at informing these two target groups directly about different aspects of the quality of their self-reported childcare features. Thus, a high level of participation in quality assessment and development of the stakeholders is realized. It can be assumed that participatory instruments and procedures will raise more acceptance of quality results and of the necessity to further develop quality compared to more 'expertocratically' applied procedures, that is, external ratings and requirements (Baumeister et al.,2017a). Acceptance of a self-assessment instrument by the stakeholders means that they regard this instrument, amongst others, as valid, reliable, and useful (Zimmerhofer, 2008). The term acceptance is often used as a synonym for social validity (Kersting, 2008). Kersting (2008), however, points out that the psychometric validity of an instrument is independent of its acceptance. A high acceptance is a prerequisite for using a self-assessment instrument frequently (Zimmerhofer, 2008). In addition, for regular application it is also important that the feedback provided by the instrument, that is, the report of the individual test results in this study, is accepted by the stakeholders. If the feedback includes a critique of the parenting behavior, for example, it is crucial to find out whether stakeholders feel threatened by this feedback (Landes and Laufer, 2013) or whether it helps them to improve their practices.

Moreover, the EPT applies a state-of-the-art method to measure quality in home-based childcare, because the assessment is based on interactions between the adult and a focal child instead of global assessments (cf. Porter et al., 2010). Consequently, the EPT allows for more specific quality development strategies tailored to individual children's needs. Two specific strengths of the EPT as an assessment instrument are, for example, that (1) parenting styles are identified, and that (2) a target child's interest in different educational activities is observed. Thus, the EPT integrates three interdependent concepts (i.e., ECEC quality, parenting styles, child interests) in one instrument.

1.3. Research questions

The aim of this evaluation study was to investigate how (1) the EPT survey, (2) the resulting report of test results, and (3) the entire procedure consisting of online survey and digital report of test results are evaluated (1) by the participating parents and non-relative caregivers as stakeholders and (2) by independent experts of childcare. Thereby, the evaluation should consist of school grades and a measure of social validity. The first research question was whether the survey, the report of test results and the entire procedure will be evaluated as "good" in terms of school grades. This criterion was set, because the pilot version of the EPT survey achieved an average rating of $M = 2.60$ ($SD = 0.83$) by 15 stakeholders. Thus, the revised

version was supposed to score better. In the pilot study, the report of test results achieved a good grade by the stakeholders ($N = 7$, $M = 2.00$, $SD = 0.58$; Baumeister et al., 2017a). The second research question explored whether the social validity of these components will be evaluated as good. The third research question addressed the problem of dropouts (i.e., part of a sample terminates study participation prematurely) by testing whether evaluations differ between persons who drop out and persons who complete this evaluation study. The following two time points were considered in the analysis of dropouts: (1) after completing the EPT online survey, that is, participants who were not interested in receiving the report of their individual test results, and (2) after receiving the report of individual test results, that is, participants who did neither evaluate the report nor the entire procedure. According to the fourth research question, it was examined whether stakeholders responded to poorer test scores with a lower rating both of the report and of the entire procedure.

2. Methods of stakeholder study

2.1. Participants

Fifty-seven persons filled out the EPT including its evaluation (mean age groups: caregivers 40–49 years old, parents 30–39 years old; only 2 persons with a migration background), whereby 12 participants indicated to be non-relative caregivers. With 45 female participants (including 10 female non-relative caregivers) and nine male participants (including one non-relative caregiver), males were underrepresented in the sample. The target children that were focused on in the quality survey ranged in age from 2.18 to 7.01 years ($M = 4.09$, $SD = 1.28$, $N = 53$). Twenty-two persons (including seven non-relative caregivers) participated in the final evaluation after the test results were reported back.

2.2. Measures

Social validity was assessed by means of the "Akzept!-P″ questionnaire by Kersting (2015). The "Akzept!-P″ measures the acceptance of personality questionnaires. Two additional scales were used: (1) the scale "Counseling Quality" (Zimmerhofer, 2008), and (2) the newly designed scale "Usefulness." The complete assessment of social validity comprised 54 items that were divided into the following three parts: (1) the evaluation of the EPT survey, (2) the evaluation of the report of test results, and (3) the final evaluation of the entire procedure (EPT survey and report of results). A few items appeared both in the parts (1.) and (2.) in case that some participants did not wish to receive a report of their test results. In this way, participants who did not complete the entire procedure could still evaluate the EPT survey at least.

The wording of the original questionnaire by Kersting (2015) was adapted to the study so that the evaluation questions referred either to "the questionnaire," "the report of results" or to "the entire procedure." The scales are briefly introduced in the following sections:

- *Controllability.* This scale explored whether participants understood the various instructions, questions and the report of test results and whether they knew how to proceed during the test (sample item: "The questions were clearly understandable.").
- *Freedom of pressure.* This scale indicated the extent to which participants were over- or under-challenged by the procedure or by individual components (sample item: "The report of test results lacks detail.").
- *Face validity.* Face validity is high if the subjectively perceived intention of the measurement corresponds highly with the diagnostic question the participants were informed about (sample item: "The results reflect tasks that are required in early childhood education and care.").
- *Freedom of response.* This scale examined whether participants could express their attitudes or behavior accurately by means of the given response alternatives (sample item: "Sometimes, I could not state the information that I wanted.").
- *Measurement Quality.* This scale captured whether the participants thought that the test could accurately represent existing differences between individuals regarding their educational and parenting behavior (sample item: "The analyzed results can convey a correct impression of a person's educational and parenting behavior.").
- *Usefulness.* Did participants perceive the procedure as helpful and would they recommend it to other persons (sample item: "I would recommend this test to other parents/caregivers.")?
- *Counseling quality.* This additional scale assessed how satisfied participants were with the feedback provided by the EPT as a tool for educational counseling (sample item: "I am still not clear on my strengths and weaknesses.").
- *Privacy protection.* This scale addressed the extent to which participants felt that their privacy was violated by the questions asked (sample item: "I think that the topics addressed in the test are far too personal and intimate.").
- *Control of bias.* Did participants present themselves to be better or worse than they actually were (sample item: "I presented myself to be better than I am.")? Did the report of test results show participants in the wrong light?

All items were answered on seven-point Likert scales ranging from 1 ("strongly disagree") to 7 ("strongly agree"). Of all intermediate scale points, only scale point four ("neutral") has a verbal label. For the overall assessment of the questionnaire, the report of test results and the entire procedure, the participants were asked to provide school grades as used in German public elementary schools, ranging from "very good" (grade 1) to "insufficient" (grade 6). At the end of the acceptance survey, participants had the option to write free comments.

2.3. Procedure

Participants were recruited on four ways: (1) *via* events organized by the Federal Association for Child Day Care, (2) *via* mail distribution lists of the various state associations for child day care, (3) *via* flyers and posters posted up in kindergartens, in educational and family counseling centers, at pediatricians, and (4) *via* advertising in social media. Completing this former version of the EPT questionnaire took about 30–45 min. Directly after the participants completed the EPT survey, they received the first

questions for evaluating the social validity of the survey. In the next step, the participants received a report of their individual test results consisting of about 16 pages. The individual test results regarding structure, process, orientation and contextual quality were classified on percentile rank scales (PRS). For this purpose, the report contained both verbal descriptions of the results (e.g., for PR above 84: "It is particularly important for you to foster your child's education.") and visual scales. The educational activities were evaluated, and the target child's interest in specific educational activities was reported (e.g., "you motivate the child to solve mathematical tasks regularly," and "according to your observation, the child shows a medium interest in mathematical tasks."). As in the survey, the report of test results also always focused on one target child. Recommendations for and examples of specific educational activities were provided whenever the individual results fell in the below average to average range (i.e., PR below 16 to 84). Background reading tips were also included. Amongst others, the parenting style was described (i.e., which aspects were more or less prominent: authoritative/authoritarian/permissive/neglectful parenting). Examples of the individual familial risk and protective factors were listed (e.g., "protective factors of your family are that both biological parents live together, that the child received breast feeding, school and professional education of the parents" etc.). The balance of individual protective and risk factors was shown on a visual scale with verbal labels (i.e., from $-3 =$ "risk factors predominate" over $0 =$ "risk factors and protective factors are balanced" to $+3 =$ "protective factors predominate"). At the end of the report of individual test results, parents and caregivers were asked to evaluate the social validity of the report of test results and of the entire procedure (EPT survey and report of results) by means of an online survey. Participation in this final online survey took about 15 min.

A major problem of online studies is the dropout rate of participants, especially if the dropout is selective (Zhou and Fishbach, 2016). To control for systematic associations between dropout or rejection of one's report of test results and the participant's rating of social validity, the evaluation of survey, report of results and the entire procedure was split into the parts described above. In this way, differences in the social validity ratings could be assessed between persons who completed the survey only and those who were interested in receiving the report on their results.

In addition, to also assess whether technical problems occurred (e.g., internet failure), at the end of each survey page, participants were asked whether they would like to continue the test. In case they did not wish to continue, participants were forwarded to the survey evaluation where they were asked to indicate the reasons for abandoning the survey (i.e., "technical problems," "questions too personal," "lack of time," "questions seemed unsuitable or inappropriate for the purpose of the project," "other").

3. Methods of expert study

3.1. Participants

The social validity of the EPT procedure was also evaluated by experts of childcare. A total of 9 experts (1 male) participated (mean

age group: 35–45 years old). One person provided her written assessment but did not complete the questionnaire, thus, only her comments were included. For the present study, experts were defined as persons who worked both with children and with parents in their everyday professional lives and, if necessary, advised them. Also included in the group of experts were persons who were professionally involved in educational science and related occupational fields. The group of experts consisted of 3 counselors of an educational and family counseling service, 2 teachers, 2 scientists of educational sciences, and 2 workers in remedial professions with treatment of children and adolescents. Each expert received the EPT survey for inspection together with an exemplary report of test results for parents or non-relative caregivers. In order to keep effort for the experts as low as possible, vignettes of test results were presented, varying the reported educational quality on three levels (i.e., above average, average, below average; see Table 1). In these vignettes, the target child was 3.5 years old and was cared for by a female. Child gender varied.

3.2. Measures

Similarly to the stakeholder study, the experts' ratings of social validity were also based on adapted items of the "Akzept!-P″" questionnaire by Kersting (2015), supplemented by the scales "Counseling Quality" (Zimmerhofer, 2008) and "Usefulness." Mostly the same items were used as those used in the evaluation done by parents and non-relative caregivers. Whenever necessary, items were adapted in their wording so that they were stated from the experts' point of view. The questionnaire for the experts included 42 items, representing the same scales of face validity, controllability, quality of measurement, freedom of pressure, usefulness, freedom of response, counseling quality and privacy protection. Moreover, the experts were also asked to give school grades for evaluating the EPT survey, the report of test results and the entire procedure.

3.3. Procedure

The experts were invited to participate by e-mail or *via* direct conversation. Each participating expert received access to the online evaluation questionnaire, a sample EPT questionnaire for parents or daycare parents, and a sample report of test results for parents or non-relative caregivers, as described earlier. The experts could choose between electronic or printed documents. In addition to the standardized evaluation questionnaire, the experts were also asked to write comments directly in the documents they had received.

4. Results

Fifty seven persons completed the EPT including the evaluation of the instrument. Only 22 of the 57 participants (39%) continued to evaluate the EPT procedure by providing their feedback regarding the report of their individual EPT test results that they had obtained and read through. In the first analysis step,

TABLE 1 Vignettes of the report of test results used in the expert study (Excerpt).

Evaluator of the report of test results	Expert #1	Expert #2	Expert #3	Expert #4	Expert #5	Expert #6
Target person of the report of test results	Parent	Parent	Parent	Non-Relative Caregiver	Non-Relative Caregiver	Non-Relative Caregiver
Gender of target person	f	f	f	f	f	f
Gender of target child	m	f	m	f	m	f
Age of target child	3.5 years					
Care and nutrition	−Ø	Ø	+Ø	−Ø	Ø	+Ø
Promotion of education	+Ø	−Ø	Ø	+Ø	−Ø	Ø
Facilities	Ø	+Ø	−Ø	Ø	+Ø	−Ø
Explanations to the Child	−Ø	Ø	+Ø	−Ø	Ø	+Ø
Promotion of verbal development	+Ø	−Ø	Ø	+Ø	−Ø	Ø

Gender: f = female, m = male. Fictitious test results of the aspects of educational quality on percentile rank scales (PRS): +Ø = above average, Ø = average, −Ø = below average.

TABLE 2 Distribution of German school grades in the stakeholder study and in the expert study.

Grade	EPT survey			Report of test results			Entire procedure		
	Parents (n = 44)	Non-relative caregivers (n = 11)	Experts (n = 8)	Parents (n = 15)	Non-relative caregivers (n = 7)	Experts (n = 8)	Parents (n = 15)	Non-relative caregivers (n = 7)	Experts (n = 7)
1 (very good)	5 (11%)	0 (0%)	1 (13%)	3 (20%)	0 (0%)	2 (25%)	3 (20%)	0 (0%)	1 (14%)
2 (good)	30 (68%)	9 (82%)	4 (50%)	6 (40%)	3 (43%)	4 (50%)	8 (53%)	2 (29%)	5 (71%)
3 (satisfying)	8 (18%)	2 (18%)	3 (38%)	5 (33%)	3 (43%)	1 (13%)	3 (20%)	4 (57%)	1 (14%)
4 (fair/pass)	1 (2%)	0 (0%)	0 (0%)	1 (7%)	1 (14%)	0 (0%)	0 (0%)	1 (14%)	0 (0%)
5 (deficient)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	1 (13%)	1 (7%)	0 (0%)	0 (0%)
6 (fail)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)	0 (0%)

Percentage within subgroup given in parentheses.

the representativeness of the participating parents and caregivers was estimated by comparing their features (e.g., highest professional degree) to those of the average German population according to the German federal office of statistics (Destatis, 2017). In this way, parental features (e.g., number of children, family status: single parent vs. married biological parents) were compared to average German families, and caregivers' features to average German providers of home-based childcare. The participating parents showed a higher educational level compared to average German parents. For example, 27% of the participating mothers owned a University degree, whereas only 9% did in the German population. Other familial features were similar to those of the German population. Similarly, the caregivers showed a higher educational level compared to average providers of home-based childcare in Germany. For example, 44% of the participating caregivers had graduated from vocational schools in contrast to only 30% of the population of German caregivers.

Due to the small sample size, participants' responses to several of the items evaluating the EPT did not follow the normal distribution. Therefore, factor analyses were not conducted and instead, relatively robust measures like Spearman correlations, t-Tests or Welch-Tests (in case of no homogeneity of variance) were preferred (Sedlmeier and Renkewitz, 2008). All data were analyzed without exclusions of outliers. Missing data were not imputed. The distribution of German school grades is shown in Table 2. Supplementary Tables 1 (stakeholder study) and 2 (expert study) provide an overview of the descriptive statistics of the social validity items.

4.1. Properties of items and scales

Correlations in small samples (i.e., below $N = 250$) usually are unstable (Schönbrodt and Perugini, 2013). Therefore, items were

TABLE 3 Test of grading of the EPT survey against criterion grade 2.

	N	M	SD	95% Confidence interval of mean value		T	df
				Lower bound	Upper bound		
Parents	44	2.11	0.62	1.93	2.30	1.22	43
Non-relative caregivers	11	2.18	0.41	1.91	2.45	1.49	10
Experts	8	2.25	0.71	1.66	2.84	1.00	7
Total	63	2.14	0.59	1.99	2.29	1.92	62

No statistically significant differences (two-tailed test).

TABLE 4 Test of grading of the report of test results against criterion grade 2.

	N	M	SD	95% Confidence interval of mean value		T	df
				Lower bound	Upper bound		
Parents	15	2.27	0.88	1.78	2.76	1.17	14
Non-Relative Caregivers	7	2.71	0.76	2.02	3.41	2.50*	6
Experts	8	2.25	1.28	1.18	3.32	0.55	7
Total	30	2.37	0.96	2.01	2.73	2.08*	29

*Statistically significant at $p < 0.05$ (two-tailed).

aggregated to scales according to their conceptual similarity, whenever the scales met both of the following criteria: (1) Cronbach's alpha should be equal or larger than 0.70, and (2) the discriminatory power of the items should be equal or larger than 0.50. Supplementary Tables 3 (stakeholder study) and 4 (expert study) provide an overview of the properties of the social validity scales.

In the stakeholder study, none of the conceptually built scales for evaluating the EPT survey achieved a sufficiently high level of Cronbach's alpha, in contrast to the expert study. Therefore, only the results of homogeneous scales are reported in the following.

4.2. Evaluation of the EPT survey

Regarding the first research question, all subgroups and the total sample of this study graded the EPT survey on average with the grade 2, which is interpreted as "good" in the German educational system (see Table 3). Thus, this target criterion was fulfilled by the EPT survey. Further, no differences in grading were found between the three subgroups of parents, non-relative caregivers and experts, Welch-Test $F(2, 15.82) = 0.18$, ns.

According to the second research question, the ratings of the social validity (i.e., including the reversed items) on average should achieve values above 5 till 7 in order to be good or very good. Since the internal consistencies of the conceptually built scales were too low in the stakeholder study, the second research question could

not be answered on the scale level. Seven items of the 11 social validity items achieved high values in the subsamples of parents and non-relative caregivers, and four items showed a neutral position (see Supplementary Table 1). Therefore, a good to very good social validity was obtained among stakeholders for the majority of assessed aspects. As an example of a neutral position, participants were unsure whether a good self-assessment could be achieved.

The eight experts evaluated the "Face Validity" of the EPT survey to be good ($M = 5.03$, $SD = 1.15$), and its "Controllabilty" to be very good ($M = 6.38$, $SD = 0.90$). The rest of the internally consistent scales showed mediocre ratings, namely for "Freedom of Response" ($M = 4.83$, $SD = 1.46$), and for "Measurement Quality" ($M = 4.92$, $SD = 1.40$). In addition, the experts indicated a neutral position regarding 6 items (see Supplementary Table 2). They suspected that the survey responses could diverge from the person's actual behavior towards children. Moreover, the experts doubted that participants presented themselves to be better than they were in the survey.

In the following, only the most frequently stated strengths and weaknesses of the EPT are reported: 86% of parents and non-relative caregivers and all of the 8 experts agreed that the questions of the EPT survey reflect tasks that are required in early childhood education and care. 63% of parents and caregivers would recommend the EPT survey to others. 11% criticized that the survey contained too many questions. All subgroups criticized that some items were not appropriate for younger children, for example, fostering of reading with 3-year-olds.

4.3. Evaluation of the report of test results

The report of individual test results was seen more critically, as it failed to reach the criterion grade 2 both in the total sample and in the subsample of non-relative caregivers (see Table 4). Again, the three subsamples did not differ in their evaluations of the report of test results, Welch-Test $F(2, 13.59) = 0.79$, ns.

In the stakeholder study, the only internally consistent scale of "Controllability" achieved good ratings on average ($N = 22$, $M = 5.46$, $SD = 1.33$). Further, no differences emerged between the subgroups of stakeholders' ratings of "Controllability," Welch-Test $F(1, 11.86) = 0.28$, ns. 13 of the 18 items evaluating the report of test results achieved good to very good ratings of their social validity by the stakeholders. Neutral positions were obtained regarding four items. Both the parents and the non-relative caregivers, however, criticized that the report presented them worse than they actually were, $M = 3.57$ ($N = 21$, $SD = 1.66$).

All experts evaluated the following aspects to be good on average: "Freedom of Pressure" ($M = 5.37$, $SD = 1.24$), "Face Validity" (2 items, $M = 5.81$, $SD = 1.46$), and "Counseling Quality" ($M = 5.75$, $SD = 1.02$). Mediocre ratings were provided for "Control of Bias" on average ($N = 6$, $M = 3.08$, $SD = 1.28$). In contrast to the stakeholders, the experts feared more that the participants presented themselves to be better than they were in the survey. Moreover, the experts had a neutral position towards both negatively biased survey responses and negatively biased test results.

91% of the parents and caregivers indicated that the length of the report of test results was okay for them. 27% criticized that reading and understanding the report was stressful. 41% indicated that the report of test results encouraged them in their parenting behavior. All

TABLE 5 Test of grading of the entire procedure (i.e., EPT survey and report of test results) against criterion grade 2.

	N	M	SD	95% Confidence interval of mean value		T	df
				Lower bound	Upper bound		
Parents	15	2.20	1.01	1.64	2.76	0.76	14
Non-Relative Caregivers	7	2.86	0.69	2.22	3.50	3.29*	6
Experts	7	2.00	0.58	1.47	2.53	0.00	6
Total	29	2.31	0.89	1.97	2.65	1.88	28

*Statistically significant at $p < 0.05$ (two-tailed).

subgroups criticized that the analysis of fostering reading and writing was not age appropriate for 3-year old children. In their opinion, the report was too strict regarding these areas of support.

4.4. Evaluation of entire procedure

The entire procedure, consisting of the EPT survey and the report of individual test results, failed to reach the criterion grade 2 in the subsample of non-relative caregivers (see Table 5). The average grades tended to differ between the three subsamples, Welch-Test $F(2, 15.15) = 3.16$, $p = 0.07$. Experts gave the highest ratings on average, and non-relative caregivers gave the lowest ratings (cf. Table 5).

Both subgroups of stakeholders took a neutral position towards "Face Validity" ($M = 4.62$, $SD = 1.29$; Welch-Test $F(1, 13.52) = 0.20$, ns), "Measurement Quality" ($M = 4.63$, $SD = 1.27$, Welch-Test $F(1, 12.33) = 0.42$, ns), and "Usefulness" of the entire procedure ($M = 4.74$, $SD = 1.32$, Welch-Test $F (1, 15.44) = 0.69$, ns; see Supplementary Table 1). In contrast to these aspects, non-relative caregivers evaluated "Freedom of Response" more critically ($N = 6$, $M = 3.44$, $SD = 1.60$) than parents ($N = 15$, $M = 5.24$, $SD = 1.43$), Welch-Test $F (1, 8.41) = 5.74$, $p = 0.04$.

The scale of "Usefulness" provided a summative evaluation of the entire procedure by the experts, On average, they rated "Usefulness" of the procedure to be good ($N = 8$, $M = 5.53$, $SD = 1.20$).

68% of the parents and caregivers regard the procedure as a good counseling instrument in questions of educational and parenting behavior towards young children. 55% of the participating stakeholders would further recommend this procedure. Seven of the eight experts believe that the procedure helps stakeholders to become clearer about their educational and parenting behavior and their goals. Five experts would further recommend the entire procedure.

4.5. Dropout control for the evaluation of the EPT survey

Only 8 parents (i.e., 14% of the participating stakeholders) were not interested in receiving the report of test results. These parents rated the EPT survey on average with the grade 2.0 ($SD = 0.54$), whereas the further participating stakeholders rated the EPT on average with the grade 2.14 ($N = 36$, $SD = 0.64$). This marks a small and statistically non-significant group difference of $d = 0.23$, $T(42) = 0.57$,

ns. It can be concluded that stakeholders that are slightly more critical continued this evaluation study.

4.6. Associations between test results and social validity

It was tested whether stakeholders whose test results were below average (i.e., PR scores of 0 till 15.9 coded by 1) would grade the report or the entire procedure worse compared to stakeholders with average or above average test results (i.e., PR scores of 16 till > 84 coded by "0"). Only small and non-significant associations emerged both between the report of test results and its grading, $r_S (21) = -0.15$ (ns), and between the test results and grading the entire procedure, $r_S (21) = -0.19$ (ns). Moreover, no association was found between below average test results and agreeing with the item "I feel that the test results present me worse than I actually am." Those who agreed with this item, however, more often gave worse grades to the report of test results, $r_S(20) = 0.52$, $p = 0.02$. Thus, the subjective feeling of being undervalued affected the ratings more than the percentile rank of test results achieved.

4.7. Dropout control for the evaluation of the report of test results

Again, it was tested whether those stakeholders who received their test results and who refused to evaluate the report and the entire procedure differed from those stakeholders who completed the entire evaluation study. Those who dropped out had achieved 5.30 below average test results on average ($N = 27$, $SD = 5.34$), whereas those who completed the last evaluation had achieved 4.68 below average test results on average ($N = 22$, $SD = 4.11$). This again marks a small and statistically non-significant group difference of $d = 0.13$, $T(47) = -0.44$, ns. Therefore, the evaluation of the report and of the entire procedure probably was not biased by below average test results.

5. Discussion

In this study, a new procedure for the self-assessment and development of ECEC quality, the 'Educational and Parenting Test for Home-Based Childcare EPT' and its report of test results, was evaluated by providers of home-based childcare and parents as stakeholders and by experts of child pedagogy. For this purpose, the experts received vignettes of three fictitious test results of quality (i.e., below average, average, and above average quality). The evaluation included grades and rating scales assessing the acceptance of the procedure (Kersting, 2005).

While the survey achieved a good grade on average, the report of test results failed to reach this criterion. The experts evaluated the entire procedure consisting of survey and report of results to be better than it was seen by the non-relative caregivers. Particularly if participants felt that their educational quality was undervalued in the report of test results, they rated the EPT worse ($r_s = 0.52$, $p = 0.02$). This pattern of findings can be explained by the psychological phenomenon that humans strive for self-confirmation and accept critique less in general (Ilgen et al., 1979). Beside this item of feeling

undervalued by the test results, only small associations between test results and stakeholders' evaluation of the report were found. Thus, stakeholders evaluate the instrument mostly independently of their own results. In addition, most aspects of measurement quality, controllability, freedom of response, freedom of pressure, counseling quality, and usefulness achieved good to very good ratings both by the stakeholders and by the experts. Therefore, it can be concluded that the EPT is a socially valid instrument that should be further optimized and applied for assessing and developing quality in home-based childcare.

Doubts were raised regarding the face validity, because stakeholders and experts deemed it possible that respondents' daily practices with children diverge from their self-assessments in the EPT. In addition, regarding the report of test results, experts provided mediocre ratings for "Control of Bias" because they feared that the participants presented themselves to be better than they were in the survey. In contrast to the experts, both the parents and the non-relative caregivers criticized that the report presented them worse than they actually were. The reported findings all represent plausible criticisms in face of a self-assessment instrument. Moreover, these findings illustrate how differently the procedure, consisting of online survey and subsequent report of individual test results, is perceived by the different subgroups of stakeholders. Consequently, several strategies were developed for addressing the different needs of stakeholders: Both the introduction to the online survey and to the report of test results were thoroughly revised to include motivating statements: That is, the participants are commended for actively and confidently dealing with sensitive and personal issues related to quality development in ECCE. In the survey, participants are assured that the results will be kept confidential. In the report of test results, arguments were added for why it is important and useful to repeatedly assess pedagogical quality in ECCE; for example, in order to become clearer about one's goals, strengths and weaknesses related to educational and parenting behavior. Further advice is offered in the report of test results and advice centers in Germany are named. In addition, a social desirability scale was included in all following versions of the EPT. This scale allows to identify and downgrade unrealistically positive answers.

In addition, comments of all participants were collected in this evaluation study. A large consensus was found that the item on fostering reading and writing was not age appropriate for 3-year-old children. Subsequently, the instrument was thoroughly revised integrating all comments received. For example, in a further study, day-care nannies assigned items to specific age groups of children. In this way, six variants of the EPT were developed differing for age groups (i.e., for children aged 0–1, 1–2, 2–3, 3–4, 4–5, 5 and older). In the next evaluation study, it is tested whether these revisions result in improved ratings of the survey and its report of results by the stakeholders. In addition, a workshop for the professional development of home-based care providers was worked out that will accompany future EPT surveys to support sustained quality development (Hamm et al., 2005).

A limitation of both the stakeholder study and the expert study was the selective sample with its small size of 45 parents, 12 day-care nannies and 9 participating experts. Sufficiently large samples are needed, amongst others, for stable correlations between the social validity items (Schönbrodt and Perugini, 2013). Consequently, factorial analyses were impossible. Moreover, as a reviewer stated, the small sample size was compounded by the number of dropouts. Dropouts are however to be expected in a study of this kind where, for example, parents avoid being confronted with critique.

To improve the comprehensibility of the EPT, plain language will be implemented in the next version of the survey and report on test results. In addition, as a reviewer noted, freedom of pressure of the report of test results needs to be reduced for the diverse backgrounds of families. This recommendation is supported by a supplementary analysis revealing that mothers with lower professional degrees rated the report to be more stressful than mothers with higher professional degrees, $r(10) = -0.62$, $p = 0.03$. Due to the highly selective sample (i.e., variance restrictions), no further correlations between education degrees and the social validity scales were found.

Overall, despite the limitations, the EPT provides a good starting point for assessing and developing quality in home-based childcare, a popular form of childcare. For example, the usefulness of the EPT procedure (i.e., survey and report of test results) was recognized by the majority of experts in this study. The majority of parents and day-care nannies recognized the counseling quality of the EPT procedure. All subgroups would further recommend the procedure to other parents or caregivers. As the reviewers of this contribution noted, further applications and development of the EPT should address, for example, the question whether the EPT is culturally sensitive to the diverse backgrounds and practices of different families and caregivers.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

Ethical review and approval were not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was provided by the participants.

Author contributions

AB and HR contributed to conception and design of the study. AB organized the materials and performed additional statistical analyses. JJ further developed the materials of the study and collected the data. JJ performed the initial statistical analyses and was supervised by AB and HR. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/feduc.2023.1147954/full#supplementary-material

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Complexifying quality: educator examples

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Quality in early childhood education settings has dominated the global economic policy agenda since the early 1990s, and despite decades of public investment, quality reform has stalled in Australia and internationally. This lack of quality improvement has been attributed to the inadequacy of the standardized, quantitative, and economic perspectives that drive policy, which are increasingly focused on systematized, academic interpretations of quality. The most impactful dimensions of quality are interpersonal and include warm, frequent interactions and rich, responsive play-based environments. However, little is known about these dimensions of quality and research is urgently needed. This paper reports initial data from a small-scale project investigating educator- and pre-service teacher-participant responses to prompts from researchers about what constitutes quality, including 'in the moment' experiences. Participants posted responses to researcher prompts to an online platform. Educator and pre-service teacher perspectives about their experiences of what constitutes quality provide a novel alternative to dominant discourses. Identifying some of the more complex dimensions of quality from the experiences of educators and pre-service teachers may reveal insight into previously untapped and difficult to access tacit knowledge.

KEYWORDS

early childhood education, complexity, quality ecologies, critical, digital ethnography

Introduction

Quality early childhood education can protect against disadvantage, establish positive life paths, and return public investment at a higher rate than any other stage of life (Heckman, 2000). This study explores an alternative methodology to generate new insights into quality in early childhood education as lived, every-day experience. The data will be used to develop a theory of quality ecologies (Authors, under review), opening alternative ways of thinking about and supporting quality pertaining to practice, policy, and budgeting.

Decades of state investment to improve quality has not produced the desired results. Based on key measures like the number of services meeting standards and social equity, quality improvement has stalled in Australia (see Hughes, 2021) and globally (Urban and Rubiano, 2014). Researchers attribute this lack of improvement to the inadequacy of the standardized, quantitative, and economic perspectives that drive policy (Penn, 2011; Roberts-Homes and Moss, 2021), which are increasingly focused on standardized, academic interpretations of quality (Grieshaber and Ryan, 2018; Hunkin, 2021). These interpretations of quality often call for attention to interpersonal relationships and contextual nuances (see OECD, 2018; Garcia et al., 2020). However, the embedded positivist paradigm limits how well complex views of quality can be conceptualized and represented, and tells only a partial story.

Existing studies of daily experiences and quality interactions typically rely on researcher observation (Henry et al., 2021), with or without the application of rating tools like the

Classroom Assessment Scoring System – Toddler (CLASS-T; La Paro et al., 2012) or CLASS - Infant (CLASS-I; Hamre et al., 2014) or the Early Childhood Environment Rating Scale (ECERS-R; Harms et al., 1998), due to the logistical difficulties of representing and evaluating such phenomena (Penn, 2011; Moss, 2014). Therefore, data are much needed that capture complex and contextual, multi-perspectival evidence of quality *as it is lived and co-constructed* in ECEC settings [Logan and Sumsion, 2010; Cloney et al., 2013; World Bank Group (WBG), 2016], as well as a theoretical frame through which to understand and apply these perspectives.

To date, research that seeks educator or other stakeholder perspectives of what constitutes quality in early childhood education and care (ECEC) settings is sparse and small in scale. In the USA, Hedges (2015) interviewed three educators and three parents in Head Start, Steiner, and Reggio Emilia aligned services respectively, and found that the service philosophy strongly informed educator perspectives of quality (p. 18). From the data set, four key themes emerged about educator foci for quality: relationships with families; school readiness; social and emotional development, and respecting children (p. 23). A Japanese study of six educators highlighted a shared perception that happiness was the highest priority when programming for quality (Ikegami and Agbenyega, 2014).

In Australia, Togher and Fenech (2020) engaged with five educators in ECEC services that had been rated as 'Working Towards' (not yet meeting) the national legislative quality standard to understand whether educator perspectives of quality were aligned with the quality rating of their service. Those who felt that the rating was not fair noted the lack of attention from assessors to the context-specific work that was being undertaken (p. 246). The importance of educator capacity was highlighted, specifically between Bachelor and Diploma qualified educators who are in principle evaluated according to the same standard (p. 258). Ten years prior, Australian researchers Logan and Sumsion (2010) had discussed with six educators what quality meant to them and their service, noting that the educators found this a difficult task:

> Given the lack of alternative languages in the existing regulatory environment, it is not surprising that the participants in this study struggled to articulate their understandings of quality. (p. 45)

Nevertheless, shared perspectives of quality as fluid, contextual and personal, as well as interconnected to its multiple contributors, were highlighted. In another Australian study, Hutchins et al. (2009) remarked about the lack of fit between Australian Indigenous perspectives of quality that favor relationships, time, family, children's learning, and communicating; and the linearity and bureaucracy that characterize ways of conceptualizing quality assurance in Australia. They also talked about the importance of actively involving the community about all matters related to quality. We seek to build on aspects that characterize Australian Indigenous perspectives concerning quality (Hutchins et al.), as well as Logan and Sumsion's (2010) suggestion of the need for 'alternative languages' and interconnections as part of positing a theory of quality ecologies and associated methodological implications. We are also interested in exploring what de Bruin and Harris (2017) call a "field of relationships" or a "joined-up approach to the *interconnections between place, space, and practices*" (p. 30, our italics). As part of this we are seeking possibilities for identifying what might seem to be unlikely and/or unanticipated connections.

This research is nested in a two-year (mid 2022-mid 2024) Early Childhood Professional Practice Partnerships Grant funded by the Victoria (Australia) Department of Education (DE). The project forms part of DE initiatives concerning workforce training, attraction and retention, part of which is establishing strong relationships between DE, universities, ECEC service providers, and initial teacher education (ITE) students through the development of effective partnership models. Aims include establishing strong and sustainable partnerships to deliver quality placement experiences for students; increased support for ECEC services to provide effective and high-quality placements; improved preparation to enter the profession by exposing students to leading professional practice, curriculum planning and team teaching, and better integration of theory with practice; and improving early childhood ITE through strengthened partnerships between ITE providers, service providers and students. Maximizing the exposure of students to service environments and providing quality service-based placements is anticipated to increase the perceived intrinsic value of early childhood teaching careers. There is also an expectation that a shared service provider-university research perspective of evidence-based, high-quality environments and practices in ITE and ECEC settings will develop.

The project is led by the research team and a site director, who is involved with project partners and students daily. During each semester in which placement occurs, the project involves enhanced on-campus experiences for students; mentoring for students and mentor teachers; professional learning for mentor teachers and service leaders working with students; high quality placement experiences (services involved were rated as Exceeding the Australian National Quality Standard), and strengthening partnerships among DE, La Trobe University, partner services, and the ECEC sector. The research question framing the project is: What constitutes quality in early childhood contexts for educators and pre-service teachers experiencing and co-creating quality in these settings? Given the emphasis on the 'what' of quality in process and structural accounts, we are interested in the 'how' (Harris and Rousell, 2022), rather than the 'what' of quality. The 'how' also encompasses the 'when' aspects of quality.

Methodology

The research design is a critical, digital, short-term ethnography that aims to gather nuanced insights concerning the 'how/when' of quality at specific times and places from firsthand experiences of educators and students. Ethical approval was granted by the DE and La Trobe University. The critical aspect of the design is informed by a developing theory of quality ecologies, which is an initial attempt to theorise the complexity of quality and experiment with that richness (Authors, under review). Web-based digital data collection tools have been used in marketing since their emergence, but the application of these tools to education research remains novel (Pink, 2012). Digital ethnography platforms allow researchers to gather data about phenomena as it occurs 'in place' without inserting themselves into that place (Pink, 2012). Such platforms have added value in the COVID era, as well as in Australian early childhood settings, which are diverse in type and location, and which have additional access and safety challenges due to the presence of children on site. This study utilizes a digital ethnography platform developed by sociologists that

is accessed through participant login, via digital phone or tablet.[1] The platform was trialed successfully on a small scale by the second author in 2021. Data are stored in the cloud by the platform for the duration of the platform contract. Once the contract and site expire all data are removed, and no data are retained or sold.

The short-term aspect of the ethnography draws on three ideas from Pink and Morgan (2013). First, the digital platform is conceptualized as an "ethnographic place" (Pink, 2009) and contextually as part of the ecologies of the larger project. Different perspectives come together digitally from persons, spaces, and temporalities in a process of identifying ethnographically ways of knowing, being, and doing quality. This participatory nature enables data to be uploaded independently in a variety of modes including photos, audio, text, and/or video using a smart phone or tablet (via a login). Visual tools might help to better understand embodied, interpersonal, or people-and-thing relationships concerning quality. Second, research activities are undertaken at several points in short intensive periods (3–4 weeks). Participation is voluntary and has no bearing on involvement in the larger project. Third, is a close and intentional focus on the detail of everyday practices, which aims to prompt the emergence of everyday and perhaps unnoticed and intangible dimensions of 'quality' as research knowledge.

Phase 1 of data generation invited participants to respond to provocations called 'activities' that appeared on the platform three times per week for up to 4 weeks. The online prompts supported participants to reflect deeply on their experiences of quality and the pedagogies and/or dimensions in which those experiences were embedded. The research team created these activities and encouraged completion via the alert system built into the platform. Responding to activities takes approximately 5–10 min per activity or up to half an hour per week and can be done asynchronously and anonymously at a time that is convenient to each participant. Any identifying information captured by video or photo is blurred by the research team prior to consignment to data analysis. Phase 2 involves focus group discussions where respondents self-elect to participate, and insights from Phase 1 data are explored through critical reflection. Preliminary data from Phase 1 are reported here.

Data is de-identified as needed (e.g., weekly) and exported to CloudStor for access by the research team. The digital platform allows researchers to group and code data including whether participants are educators or students, as well as access NVivo qualitative software for more sophisticated analyses. Thematic and content analysis will inform Phase 2. The digital platform allows participant numbers to grow without putting pressure on research team resources. The sample size is flexible and can adjust to accommodate participant interest. The preliminary data reported here are drawn from 11 participants: five early childhood educators and six students. The number of participants was affected by recent widespread floods in central and northern Victoria, curtailing some placement experiences and service participation. These initial digital responses generated nuanced, multi-perspectival insights into what quality is and does for educators and students co-constructing the phenomena. Initial data reported here are being used to refine approaches for the next iteration of ethnographic data generation in early 2023.

1 www.recollective.com

Findings

We present initial data in two clusters related to quality being conceptualized as relationships and connection, and feeling. Two other clusters are not reported. Excerpts from respondents have been extracted from the platform, coded, and clustered. The five educators and six students made a total of 70 responses to the 10 activities.

Quality as relationships and connection

Relationships are key to what respondents identified as what 'quality' and 'high quality' mean. They involve children, families, stakeholders, and communities; and characteristics such as reciprocity, respect, and diversity. Of the 11 responses to the first activity (*What is quality?*), 10 specifically named 'relationships' and explained what was meant by relationships. For instance, when relationships are built on, and develop from good connections; they can then be extended to the content of the program and community:

> I believe that Quality in ECE is connection. Connection with families, educators, stakeholders. If you have a good quality connection you can build on relationships, program content and community development. (Educator 665)

In the following excerpt from a student, while the idea of relationships is foundational, quality means creating a program that reflects the diversity of the families attending the service.

> Quality in EC settings is the relationships formed between the center and the families that attend. It is the relationships between the children in the room, and the educators that care for them. It is the respectful relationships formed between the educators and the parents and the families of the children in attendance. Quality is the creation of a program that reflects the diversity of the families that are part of the center community, and these strong relationships formed help to guide this program. (ITE student 691)

Strong relationships are the basis for developing a program that is consultative and to some extent co-created with families.

Another student also framed quality around relationships, and linked relationships to the notion of inclusivity and creating a program that reflects the values and beliefs of the children and families attending.

> When I think about quality in ECEC, the first thing that comes to mind is the engagement of children in the program and the relationships formed between educators and the children and their families. Quality in ECEC is devising a program that is inclusive of all children and appeals to their interests. It is also about forming respectful, reciprocal relationships with the children and their families to ensure that the program reflects the values and beliefs of the children in attendance. (ITE student 448)

The second activity (*What does high quality mean?*) produced nine responses, four of which mentioned relationships specifically. Overall, the nine responses were more focused on aspects such as learning environments, pedagogy, resources, interactions, and children's

engagement. Educator comments relating to high quality settings included: "…educators know the routines of individual children, they are active in their interactions with children and are intentional in their actions…When educators do not know something they actively seek to understand" (Educator 665). The educator made three suggestions for assisting understanding and these included talking to the child if possible, discussing with families, and searching for further information through professional reflection. A student referred to pedagogical inquiry when she stated: "When high quality happens you have opportunities to inquire more with children…High quality is taking the time to notice, to be, and develop a sense of place" (047).

Two educators identified the importance of genuine and authentic relationships and the connection to high quality: "A direct effort to include the viewpoints of the families within the center will be evident, through mediums such as QIP [Quality Improvement Program] wall, books for parent feedback, genuine conversations and respectful and meaningful interactions with the children" (Educator 691). Educator 665 stated that "High quality can be identified through relationships between educators, children, families, and the community. You cannot fake relationships." The implication here is that relationships are the fabric of what happens in services, and that relationships are evident in a range of interactions and different ways of communicating.

Quality as feeling

The specific activity prompt about feeling was *How does quality in EC settings feel?* However, feeling was mentioned in responses to other activities such as *What is quality?; Can quality be captured in a non-verbal exchange?* and *How will you know if an EC setting is high quality?* Respondents conveyed a sense that quality can be identified through feeling; something that is embodied and exists in conjunction with other sensory information related to markers of quality. Three educators identified the immediacy of feeling something. It might be a feeling of deep engagement through supporting children's interests: "I think about the feeling you get when you walk into a space - children and staff highly engaged, following the children's lead and inquiring and exploring interests. I think there are strong relationships and respect" (Educator 047). Educator 119 mentioned feeling as an indicator of high quality: "You will know when you walk into a service if it is high quality by the feel you get." Alternatively, a feeling of high quality may be generated from interactions as well as observations and talking to people in the community:

> When entering a service you can immediately see or get a sense of feeling from the educators you interact with…the children you come in contact with and from visually observing the children interact with the environment…talking to the community about what they have heard or contact they have had with a service. These relationships need to be strong and genuine to be a high quality. (Educator 665)

Feeling extended to how people feel while in the service: "For all children, families as well as other educators, feeling that they are accepted for who they are" (Educator 444). Two students commented, the first noting that "In a high quality EC setting – all children feel comfortable" (ITE student 115), and the second stating "…quality

should feel like a warm, welcome, uplifting, positive environment that children and families feel connected to" (ITE student 233). Educators echoed these ideas more broadly: "Quality feels like safety and comfort" (Educator 235) and "A quality feel when entering an EC service is being comfortable in the space" (Educator 665). We detect from these responses that 'the feel of' and 'feelings' generated while in services are very important for educators and students, and that positive feelings and comfort are related closely to strong relationships. Other sensory information such as what quality looks and sounds like is also significant.

Discussion

Initial insights suggest that educators and students talk in complex but predictable ways about quality and high quality as it relates to relationships and connection, and feeling. Participants echoed language and concepts which are consistent with existing quality frameworks such as relationships, diversity, connections, respect, warmth, positivity, and feeling safe. There was little evidence of the joy or excitement of in-the-moment 'quality' learning and teaching, or the idea of risk-taking as part of the pursuit of engaged and meaningful learning, even in outdoor settings. Given the dominance of the standardized quality agenda, these conventional responses might have been expected. On initial indications, it appears that the need for alternative languages (Logan and Sumsion, 2010) remains current, which highlights the opportunity to move beyond existing dominant scripts to challenge how quality is currently conceptualized, and to encourage educators to convey impromptu and candid expressions of what everyday lived quality is and can be.

Our interest is how educators and students go about creating or making quality in everyday practices. We are unsure if educators and students consciously consider and explicitly discuss quality as part of everyday work with children and families, mainly because of the busyness of daily life (staff meetings etc. excepted). Quality is not always reflected in verbal interactions and as the responses have indicated, it is highly likely to be present in embodied actions in particular contexts. How educators understand and enact quality then, is likely to be "embodied, sensory, and emplaced" (Pink and Morgan, 2013, p. 358). It is also likely to be about the 'how and when' of quality rather than the 'what' (Authors, under review; see Harris and Rousell, 2022). We are trying to learn about what already exists in, and is created in everyday, ongoing, and taken-for-granted practices of quality that may be invisible because they are routine, and possibly seen as unremarkable because of their mundanity. Stripping away the everyday 'busyness' might help identify connections that are not apparent. And as Pink and Morgan (2013) suggest, we are keeping in mind the "ethnographic-theoretical" dialogue (p. 359), by intertwining data collection and analysis, and bringing theoretical questions into dialogue with the ethnography to create a theory of quality ecologies.

Conclusion

The project includes four more rounds of data collection in 2023 and 2024, including focus group interviews following each cycle where

participants will be encouraged to link feelings to moments when they are engaged with children in learning, and share the 'how and when' of quality. Creating an embodied and emotional vocabulary of quality is a resource the sector can use to legitimate non-standardized expressions of quality. Data will be coded and interpreted to inform the development of a theory of quality ecologies. The aim is to tap into how participants co-create conditions for quality; how quality emerges spontaneously; how it is inspirational; how it is challenging, and how it is routine (Authors, under review).

Data availability statement

The datasets presented in this article are not readily available because the ethics approvals indicate they are available to research team only. Requests to access the datasets should be directed to s.grieshaber@latrobe.edu.au.

Ethics statement

The studies involving human participants were reviewed and approved by La Trobe University Ethics Committee and Department of Education and Early Childhood Development, State Government of Victoria, Australia. The participants provided their written informed consent to participate in this study.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Mapping the leap: differences in quality improvement in relation to assessment rating outcomes

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Introduction: Australia's National Quality Standard (NQS) outlines the criteria to assess the quality of early childhood services. A four-point rating scale: (i) Exceeding NQS; (ii) Meeting NQS; (iii) Working Toward NQS; and (iv) Significant Improvement Required is applied to services following a regular assessment and rating process. Settings rated as Working Toward are reassessed within 12 months. Most settings achieved a one-step improvement in this Time 2 reassessment, moving to a Meeting rating but some settings made a two-step improvement, moving to an Exceeding rating. The QIP is a key document used by authorities to assess the quality of a service.

Methods: A grounded theory, data driven approach was taken to deepen understanding of quality rating improvements in long day care services in Australia of quality rating improvements by early childhood education and care [ECEC] services in Australia. This study, part of the second phase of a three phase study involved a document analysis of the Time 2 Quality Improvement Plans (QIPs) of a representative sample of Long Day Care (LDC) services (n = 60) from all Australian states and territories to determine what factors may have contributed to these different levels of improvement, with a focus on Quality Area 1 (QA1) (Educational programs and practices) and Quality Area 7 (QA7) (Governance and leadership). The study utilized the semantic analysis tool Leximancer 4.5. Leximancer 4.5 statistically analyses the semantic relationships between concepts in documents by measuring word proximity and correlation. The software creates visual maps of concepts and their connections to each other in texts. Concepts located near one another on the map are more likely to be contextually related. This tool is particularly useful when there are multiple, complex documents to analyze, reducing the potential biases that can arise from documents that use language with which these researchers are very familiar with.

Results: The analysis found clear differences between the Time 2 QIPs of services who had made a two-step rating improvement and those who made a one-step improvement. Two-step (Exceeding NQS) category improvers for QA1 placed attention in their QIPs on improvement to the program and overall practice, with an orientation to the role of the educational leader. Two-step (Exceeding NQS) category improvers for QA7 seemed to be more oriented to a systemic view of the processes encompassed by QA7; how the management of the service and information supports the work of educators, with stronger links made between leadership roles (the manager and nominated supervisor) and the work of educators.

Discussion: The QIPs demonstrated how the intentional and systemic processes in these quality areas related to practice, management, and leadership.

1. Introduction

This paper reports on the second phase of a larger study commissioned by the Australian Children's Education and Care Quality Authority [ACECQA] in 2018 (Harrison et al., 2023) where the focus was on the small but significant number of LDC services achieving a two-step improvement in an overall quality rating after receiving a Working Toward rating in a first assessment. The intention was to develop an understanding of how these LDC services differed from those who had made a one-step improvement only. We present the findings of a qualitative analysis, using the conceptual analysis tool Leximancer 4.5 (Leximancer, 2018a,b) of the Quality Improvement Plans (QIPs) of 60 LDC services selected through proportionate stratified random sampling in the initial phase of the study (Harrison et al., 2023), as representative of LDC in Australia. Harrison et al. (2023) explained this focus in the protocol paper for Phase 1 of this research as "While all seven QAs contribute to overall quality, QA1 Educational program and practice is recognized as "the most critical to longer term child outcomes" (Australian Children's Education and Care Authority [ACECQA], 2016, p. 40) and QA7 Governance and leadership as "central" to all quality areas because "the way a services addresses the NQS will be directly influenced by the quality of its leadership and management" (Australian Children's Education and Care Authority [ACECQA], 2017, p. 47)." The analysis sought to investigate the features and plans which contributed to Quality Areas (QAs) 1 and 7 improvements.

1.1. Research context: the Australian QRIS system for ECEC

Australia has a national system for regulating the quality improvement for early childhood education and care (ECEC) across all states and territories in the federation (Council of Australian Governments [COAG], 2009; Sims et al., 2017). ACECQA is the national body that supports governments in administering the National Quality Framework (NQF) and the National Quality Standard (NQS) (Australian Children's Education and Care Authority [ACECQA], 2012, 2020) for children's education and care. ACECQA works with Australian State and Territory governments to work with states and territories to operationalize the national assessment and rating process; lead the two national Approved Learning Frameworks which guide educational programs and practices in ECEC and OSHC and drive continuous quality improvement in education and care (Australian Children's Education and Care Authority [ACECQA], 2023).

The NQS creates benchmarks for ECEC practice, comprising seven QAs designed to meet outcomes for children.

The seven QAs, as listed in the ACECQA website are:

1. Educational program and practice
2. Children's health and safety
3. Physical environment
4. Staffing arrangements
5. Relationships with children
6. Collaborative partnerships with children and families
7. Governance and leadership (Australian Children's Education and Care Authority [ACECQA], 2020).

While all seven QAs contribute to overall ECEC service quality, QA1 Educational program and practice is recognized as "the most critical to longer term child outcomes" (Australian Children's Education and Care Authority [ACECQA], 2016, p. 40) and QA7 Governance and leadership as "central" to all quality areas because "the way a service addresses the NQS will be directly influenced by the quality of its leadership and management" (Australian Children's Education and Care Authority [ACECQA], 2017, p. 47).

An overarching aim of the NQS is to "raise quality and drive continuous improvement" (Australian Children's Education and Care Authority [ACECQA], 2020, p. 8), and engagement with the NQS assessment and rating (A&R) process is a critical component of this system. Services enter a process of preparation for this assessment through collective self-reflection and the development of a Quality Improvement Plan [QIP] (Australian Children's Education and Care Authority [ACECQA], 2020). The aim of the QIP is to enable services to "self-assess their performance in delivering quality education and care and to plan future improvements" (Australian Children's Education and Care Authority [ACECQA], 2012, p. 34). The QIP is included in the A & R process, as ECEC services are required to submit their QIP to the regulatory authority and this is used to support the A &R process.

Services receive a rating for each QA and are awarded an overall service rating. According to the ACECQA website, there are four possible ratings that can be achieved after an A&R visit (from the highest): "(i) Exceeding NQS; (ii) Meeting NQS; (iii) Working Toward NQS; and (iv) Significant Improvement Required" (Australian Children's Education and Care Authority [ACECQA], 2020). A further rating – Excellent – the highest possible rating – can be achieved by services rated as 'Exceeding' in all QAs, through an additional application process administered through ACECQA. Receiving a Working Toward NQS rating means the service will be reassessed in 12 months (Australian Children's Education and Care Authority [ACECQA], 2018). Australian Children's Education and Care Authority [ACECQA]'s (2018) examination of Australian ECEC services that were assessed against the NQS between 2013 and 2017 found that over 60% of childcare centres and over 80% of preschools that were initially rated as Working Toward were able to demonstrate improvements.

1.2. Literature review

1.2.1. Impact of quality in ECEC

Internationally, it has been recognized that the quality of care and education in early childhood has significant positive benefit

across the lifespan (Organisation for Economic Cooperation and Development [OECD], 2015). During the last 10 years, Australian governments at the nation and state/territory levels and the ECEC profession have been concerned with ongoing quality improvement. These improvements need to address both structural and process elements of service function. The NQF, has specifically targeted establishing consistent national quality standards (Torii et al., 2017).

The core activity of ECEC is the design of learning environments that support relationships, interactions and learning for all children (Cloney et al., 2016). It is concerning however that QA1, 'Educational program and practice' is the quality area services are most likely to rate poorly against (Australian Children's Education and Care Authority [ACECQA], 2017). To improve quality across ECEC, supports that strengthen early childhood educator skills, knowledge and interactions must be a core focus (Torii et al., 2017). The workforce crisis in ECEC, intensified amidst the stresses imposed by the COVID-19 pandemic (McFarland et al., 2022), with persistent issues around poor remuneration, low public and political recognition of the value of ECEC and consequent low staff satisfaction and poor retention, has inhibited quality improvement (Irvine et al., 2016; Cumming et al., 2021).

1.2.2. Role of leadership in quality

Leadership and management of ECEC services are recognized as critical to quality care experiences and education outcomes for children. QA7 was developed in recognition of this (Australian Children's Education and Care Authority [ACECQA], 2020). Historically there has been concern that few ECEC leaders have formal leadership training, despite the demands for leadership placed upon them (Hard and O'Gorman, 2007; Rodd, 2013; LeeKeenan and Ponte, 2018). Halttunen et al. (2019) examined practices relating to pedagogical leadership across three different countries and impact of leadership on pedagogy and quality in ECEC settings, finding that ECEC leadership roles are complex but poorly defined and heavily reliant on individual context arrangements, with heavy administrative and compliance responsibilities that needed to be balanced against pedagogical leadership and relationship development. While there are models for developing leaders in the school system there is limited consistent practice or a commonly held model of leadership in ECEC (Aubrey, 2019).

Mathers et al. (2012) found the quality of a service is dependent upon the direct interactional experience of children in ECEC with educators who have skills and expertise to provide appropriate guidance and support their learning. This is supported by other research emphasizing the crucial role of qualifications for leaders and their role in developing and supporting relationships with other educators, children, and their families (Howes et al., 2008).

2. Materials and methods

This research was part of the second phase of a three-phase study, aimed at investigating what factors contributed to improving quality in QA1 and QA7 of the NQS, given that ECEC services tend to rate lower against QA1, and the critical importance of both quality areas for child outcomes in ECEC.

Grounded theory was deemed as a suitable approach to this research. There is very limited research specifically investigating QA1 and QA7 in the Australian ECEC context. The QIPs were effectively qualitative data. We followed the principles of grounded theory encompassing looking for concepts, categorizing these and discovering theme as they emerged from the data (Glaser and Strauss, 1967). Grounded theory was developed to create theories that were empirically driven from real-world situations (Glaser and Strauss, 1967). It was a methodology that emerged because it was understandable by practitioners and would work in real life situations. Data gathering and data analysis are simultaneous in grounded theory. Grounded theory uses both inductive (theory generation) and deductive (theory testing). There are four key components of grounded theory incorporating theoretical sensitivity; constant comparison; theoretical sampling and theoretical saturation which are used in combination to develop theory from the data (Corbin and Strauss, 2008). Glaser and Strauss (1967) suggest theoretical sensitivity is based on familiarity with sociological theories and concepts alongside professional experience. As academics at university, we have a range of expertise and understanding of theories as well as our experience as early childhood teachers and educators. Constant comparison is about comparing cases in our data which were the QIPs from individual ECEC services to look for commonalities that emerged for quality improvement where conceptual categories were specified and described. Importantly, this cannot be determined in advance. Theoretical saturation occurs when no new concepts can be seen in the data which is the point of saturation. These components work together as we first used the discovery process enabled by Leximancer 4.5 (Leximancer, 2018a,b) as we explored the factors enabling change. We followed the principle by focusing on this broad research focus question: What factors enabled quality improvement in QA1 and QA7? (Glaser and Strauss, 1967; Glaser, 1978; Charmaz, 2006; Urquhart, 2013).

Documents are important sources of data for researchers as vehicles of records, thinking and social expression (Bowen, 2009; Wharton, 2011). Traditionally a source of data for historical research, documents relevant to the contemporary context for their record of societal and institutional values are an important source for critical reflection on policy and practice (Sumsion and Wong, 2011). A common critique of reports of document analysis is that the process of document selection and analysis is not explicit, the credibility, relevance and procedures and tools for analysis need to be clearly explained (Bowen, 2009; Wharton, 2011). As noted above, the QIPs are documents that describe the reflective process of the service, as they document the practices of the service and changes identified as needed to support continuous and ongoing quality improvement. As such they are an important source to develop an understanding of the process and focus for quality improvement in the services included in the analysis.

2.1. Data

A representative sample of 60 LDC services was selected for Phase 2 based on the findings of the first phase of the study (Harrison et al.,

2023). De-identified copies of QIPs from 60 LDC services were provided by ACECQA. *Leximancer 4.5* (Leximancer, 2018a) was used to conceptually analyze this data, as we sought to determine what patterns of thinking and reflection may emerge from the QIPs that supported quality rating improvement.

2.2. Data analysis

2.2.1. Leximancer 4.5

Leximancer 4.5 (Leximancer, 2018a,b) is a qualitative, conceptual, and relational analysis tool. It can be used to efficiently and systematically analyze large amounts of natural language texts, producing reliable, reproduceable results, based on its measurement of the occurrence and co-occurrence of words in text (Smith and Humphreys, 2006; Angus et al., 2013). Researchers can manually refine the automated process to suit their research interests and purpose. Leximancer reduces the need for manual handling of data, when compared to other software used to code and manage qualitative data, such as *NVivo* (Sotiriadou et al., 2014).

Leximancer is being used across a growing range of research areas where natural language is being studied, particularly where large amounts of text might be under analysis. Initially used by mainly business researchers, to understand conceptualizations of social responsibility by mining companies in annual reporting (Parsons and McKenna, 2005) for example, it has been extensively used by news and social media analysts to consider patterns of reporting (Spry and Dwyer, 2017), trends in opinion (Carah et al., 2016; McKenna et al., 2017) and image development (Tseng et al., 2015). Academic researchers have used *Leximancer* to investigate conceptual development in a range of academic fields: the history of ideas within a single journal (Rooney et al., 2011) and the development and use of terms: *accountability* in accounting (Crofts and Bisman, 2010) and *corporate environmental performance* (Poser et al., 2012). Analysts of educational policy and curriculum have also made use of the application to consider how concepts have developed and shifted in the process of document drafting (Millei and Sumsion, 2011), make conceptual comparisons in curriculum documents in different jurisdictions (Hyndman and Pill, 2018), explore how curriculum documents may or may not be explicit about attitudes and practices (Davis and Dunn, 2018) and how policy and curricula impact particular interest groups, rural communities and schools (Roberts, 2017). Groups of documents can be analyzed as categorized files to explore different relationships (Leximancer, 2018b): Roberts (2017) used the group file clustering or tagging capacity of *Leximancer* to explore where categories of participants stood in relation to particular themes and concepts, finding that demographic differences (for example age, time in community or relative isolation of community) influenced concerns and attitudes participant teachers had to recent curricular changes.

Leximancer's discovery process supports the development of an initial sense of the data and guides subsequent enquiry, without any direct intervention by the researcher, so aiding a grounded theory analysis of the data (Angus et al., 2013; Leximancer, 2018a,b). Leximancer uses blocks of text and the co-occurrence and frequencies of words in a text to develop thematic clusters, described as 'concepts' (Angus et al., 2013; Sotiriadou et al., 2014; Leximancer, 2018a,b). This

is presented visually in a concept map, where the connections between concepts and their importance in the data are illustrated. While the analysis has a statistical basis, the need to interpret the map in the context of the texts the data is drawn from means the final analysis of the data is more qualitative (Angus et al., 2013).

The QIPs ($n=60$) that were investigated in this project were all grounded in the NQS, and all had a great similarity in their language as a result. Simultaneously they were also idiosyncratic documents, individual to each of the services who developed them. A particular feature of *Leximancer*, and its key advantage as an analytical tool in this instance, is its capacity to cut through the similarity of language in documents and find the underlying subtleties and nuances of meaning and thinking that differentiate different groups of documents from each other (Angus et al., 2013; Hyndman and Pill, 2018). The language of the NQS, further, was very familiar to us as researchers in early childhood in Australia, so *Leximancer* provided a valuable bracketing function, a feature noted by other ECEC researchers (Millei and Sumsion, 2011).

2.3. Leximancer 4.5 analysis of QIPs

2.3.1. Document preparation prior to Leximancer 4.5 analysis

The deidentified QIP documents provided were presented in a range of formats, including plans and reflections about all the QAs. Most were tabulated but others were descriptive prose. We needed to extract the relevant data (for QA1 and QA7) and following advice from an experienced Leximancer user, we eliminated all extraneous formatting and converted all the relevant text into *.txt files to create document uniformity and compatibility with the application (Angus, 2014; Figure 1). Small typographical errors were also amended at this stage to ensure spelling, for example, was correct and consistent across all the documents. Each QA was analyzed separately.

2.3.2. Document analysis

Some adjustment was made to concept labels to refine and support analysis following an initial analysis of the documents on default settings. We refined the analysis by requiring the software turn off "name-like concepts" (*Leximancer* will identify nouns used at the start of a sentence or in the text with a capital letter as a proper noun) (Leximancer, 2018b). Adjustments to ensure the inclusion of concepts including *leadership* for the QA7 analysis and *philosophy* for the QA1 analysis were made. These were found to be concepts with quite low order relevance in both the texts and their positioning and relationships to other concepts but were of interest to the research. This may seem extraordinary, given the nature and content of the QAs under analysis. We have often found though that these primary ideas are sometimes rarely mentioned directly in documents, where they are ideas that operate as a sub-textual theme that is assumed. Subsequently, *educational* and *leader* were added as new concept seeds, as were *professional* and *development*, also to identify concepts that did not arise clearly in the default analysis. We also noted slight variances in the way service names had been de-identified. We merged all these combinations and re-labeled them as *service name* to refine the map and increase clarity.

The files were then grouped into two categories for each QA, one file for those QIPs from services who made a one-step rating

FIGURE 1

Flow chart of document preparation and analysis procedure steps.
[1] *l-concept*: concept identified by Leximancer, represented by a node on the concept map. We used this term in our research group communications to distinguish concepts identified by Leximancer from a more general use of the term concept.
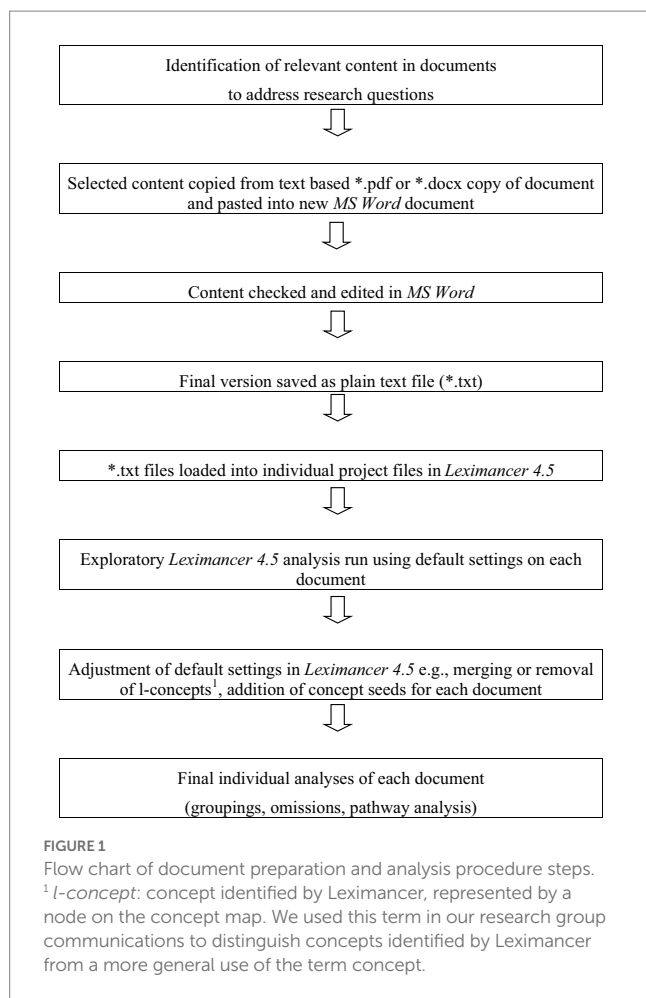
improvement at the Time 2 A&R (from Working Toward to Meeting the NQS) and one file for those QIPs from services who made a two-step rating improvement at the Time 2 A&R (from Working Toward to Exceeding the NQS). This categorization supported our developing understanding of the differences between these two groups. The positioning of the groups on each map in relation to each other, core concepts and themes and the mapped pathways between concepts were considered in each case.

3. Findings

The *Leximancer 4.5* analysis demonstrated some clear differences between Time 2 QIPS developed by one-step (Meeting NQS) category services and two-step (Exceeding NQS) category services across both quality areas.

3.1. Findings for Quality Area 1

The mapping of the Time 2 QIPs for Quality Area 1 found children's learning alongside educator skills were emphasized in plans for improvement in this quality area, as indicated by the central position and co-location of these concepts in the map (Figure 2). Direct pathways are evident between *children, learning, educators,* and

skills. These concepts are at the core of all the QIPs analyzed. These concepts all share a similar relevance in the document at between 29 and 27%, as shown in Table 1. The importance of these concepts is visually demonstrated by the central positioning of quite large nodes in the map, as shown in Figure 2. This suggests that QIPs developed for QA1 share a similar primary focus on children's learning and the work of educators in relation to that.

Concepts related to the 'boiler plating' (or structural elements) of the template are evident in the incidence of concepts such as *notes, goal, outcome, key, plan* and *identified*. While these are important structurally to the QIPs and explain purposes for different activities related to the QIP process, the very peripheral positioning of these concepts demonstrated that while they are of some importance, they are not a matter of central concern. Of greater interest were the range of concepts relating to the program and planning, such as *experiences, time, development* and the *environment*. These concepts were clustered around the core concepts of *children* and *learning*, close to concepts relating to *staff, children* and *families*. This would seem to indicate the consideration of the range of stakeholders and their potential contribution to children's learning in the development of the QIPs.

3.1.1. Thematic importance

The heat mapping of the themes shown in Figure 3 and Table 2 speaks to the priorities of the QIPs overall and amongst the improvement services. The role of educators and the experiences of children was critical across all the documents but were of greater concern, it would seem, to services that made a one-step improvement to Meeting NQS. Services that made a two-step improvement to Exceeding NQS placed greater emphasis on the *program*, also a high-ranking theme across the documents in total, but ideas associated with *practices, improvement* and *steps* were more explicit in the Exceeding QIPs.

3.1.2. Comparison between one-step (meeting NQS) category and two-step (exceeding NQS) category QIPs for QA1

The comparative analysis undertaken by tagging the one-step (Meeting NQS) category and two-step (Exceeding NQS) category QIPs was revealing. The location of nodes labeled *FOLDER1_qa1 meeting* and *FOLDER1_qa1 exceeding* shows how the two categories of services compared with each other (Figure 4). The size of the nodes on the map for each folder is only an indication that more services were in the one-step (Meeting NQS) category and there were fewer in the two-step (Exceeding NQS) category. The diametric positioning of the folder nodes on the maps demonstrates significant differences between the QIPs in these different categories.

Firstly, the proximity of the Folder nodes in relation to the overall map was of interest (Figure 2). The Exceeding services are quite close to the map itself, with direct conceptual connections to *staff* and *practice*. The folder node for the Meeting services is however at some distance from the overall map. This suggests that Exceeding services' QIPs were quite closely aligned with the ideas the QIPs explore overall. The node representing the collected Meeting QIPS is at a clear distance from the map overall, with a direct conceptual link to *children*, suggesting that there was a more superficial connection with the ideas the QIPs explore overall (Table 3).
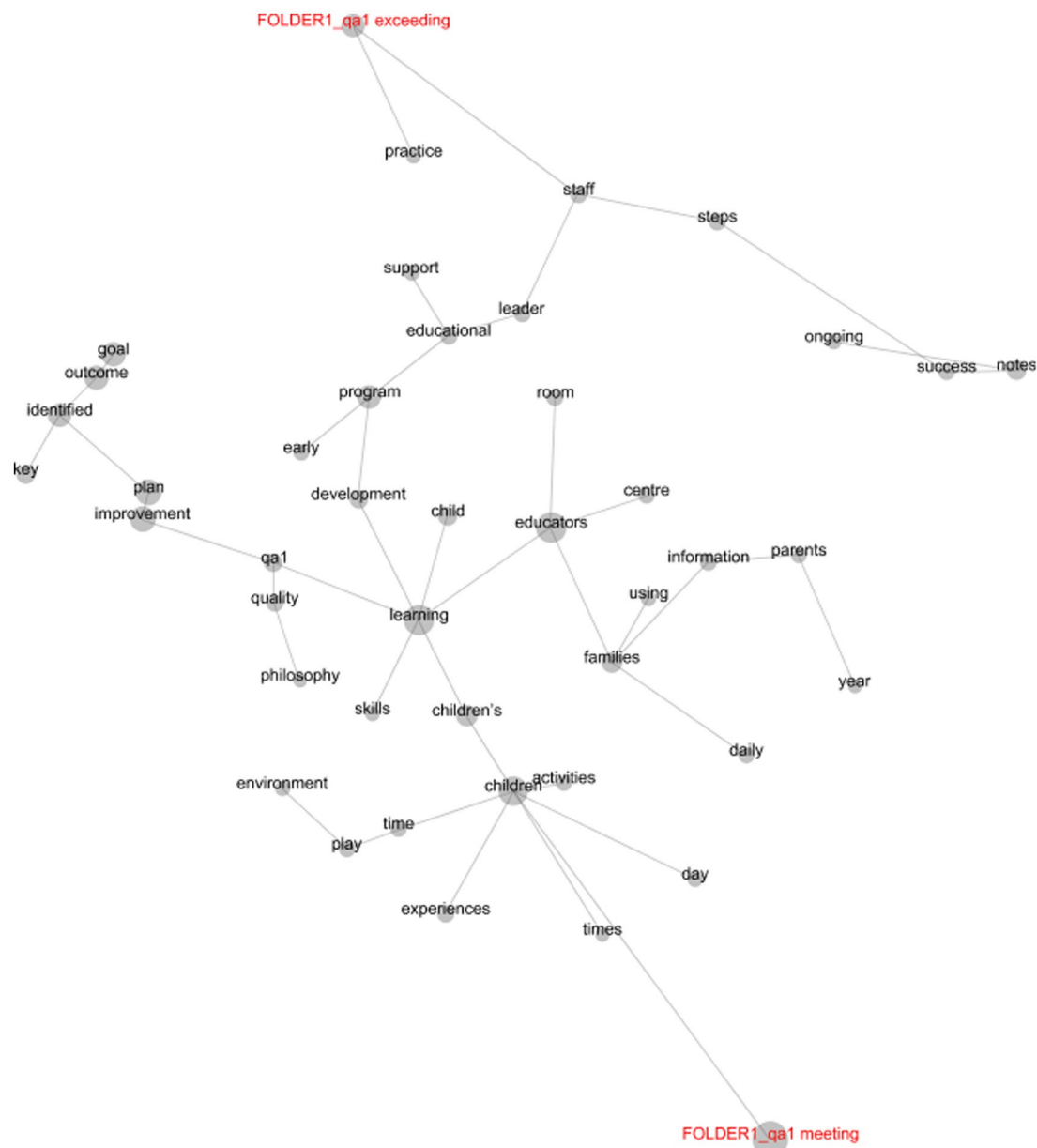
FIGURE 2
Concept map: comparison of one-step and two-step improvement services for Quality Area 1.

Secondly, the colocation of the folders with themed clusters of concepts was revealing (Figure 3). Services that improved one step seem to have emphasized the daily routines and experiences of the children within the environment (summarized by the themes *experiences, daily* and *educators*) (Figure 3). Services that improved two steps placed attention on improvement to the *program* and *practice*. The educational leader role is located within the *program* theme and directly connected semantically to staff, support and program. *Program* itself was directly linked to *development* and *learning,* then to *children's* and *children* (Figure 3).

We then explored the conceptual pathways between some key concepts. Concepts may be located close to one another on the map but are not always visually represented as connected by drawn

pathways. The pathways indicate nuanced connections between ideas. One-step (Meeting NQS) category QIPs (blue lines), who focused attention on the daily experiences of children, demonstrated a quite scattered focus on a range of individual considerations for planning and programming (Figure 4). Two-step (Exceeding NQS) category QIPs (red lines), conversely, focused on educational leadership (Figure 4). Such a focus indicated a commitment to providing time and support to develop programs and support staff in ways that went beyond a reactive approach. This recognition of the role of the educational leader to drive improvements in children's learning experiences appeared to demonstrate a deeper level of understanding of what may contribute to positive child outcomes and service excellence (Figure 5).

TABLE 1 Leximancer analysis of QIP QA7 extracts, concepts and relevance percentage.

Concept	Relevance percentage
Educators	22
Staff	21
Summary	17
Plan	16
Improvement	16
Outcome	14
Standard	13
Centre	13
Service	11
Measure	11
Steps	10
Success	10
Families	10
Notes	9
Strengths	8
Quality	7
Development	7
Children	7
Philosophy	6
Process	6
Management	6
Support	6
Ensure	6
Educational	6
Information	5
Professional	5
Team	5
Induction	4
Time	4
Manager	4
Work	4
Training	4
Educator	3
Working	3
Stored	3
Nominated	3
Program	2
Early	2

3.2. Findings for Quality Area 7

The mapping of the Time 2 QIPs for QA 7 found that *educators, management*, and *professional development* were placed in a central position on the concept map, close to one another, demonstrating a consciousness of the relationship between these ideas and high quality

ECEC (Figure 3). These concepts are at the core of all the QIPs analyzed for QA7.

The core concepts in the QIPS for QA 7 centred on *educators* and *staff*. The use of these two concepts suggests that there is a distinction drawn between educators and other centre staff in different roles, but at times it is a catch-all phrase for all adults working in the service. These concepts share a similar relevance in the document at between 22 and 21%, as shown in Table 1. The importance of these concepts is visually demonstrated by the central positioning of quite large nodes in the map (Figure 3). This suggests that QIPs developed for QA7 share a similar primary focus on the role of educators and people working in the service.

Concepts related to the 'boiler plating' of the template are evident again in the incidence of concepts such as *outcome, improvement, plan, steps* and *standard*. These were important structurally to the QIPs and explained purposes for different activities related to the QIP process, while they are relatively peripheral, they are quite closely co-located with concepts including *educators* and *management*.

3.2.1. Thematic importance

The heat mapping of the themes shown in Figure 6 and Table 4 again speaks to the priorities of the QIPs amongst all the improvement services. While one-step (Meeting NQS) category QIPs were concerned with educators and staff, both very important concepts across all the QIPs analyzed, two-step (Exceeding NQS) category QIPs were more focused on supporting staff at all levels in the service, notably through strategies designed to enable staff to engage in professional learning for QA 7. One-step (Meeting NQS) category services seem to have followed the template very closely, alignment with standards and outcomes was emphasized. This is in contrast to QA 7 two-step (Exceeding NQS) category services whereby educators were supported by management structures and roles.

3.2.2. Comparison between one-step (meeting NQS) category and two-step (exceeding NQS) category QIPs

The differences between the one-step (Meeting NQS) category and two-step (Exceeding NQS) category QIPs and the concepts of greatest relevance in their QIPs was evident in the percentage relevance of important concepts in the two-step improving QIPs, such as *support, manager,* and *training*, which were all ranked at less than 10% relevance (Table 1). This is reflective in part by the lesser number of two-step (Exceeding NQS) category QIPs in the sample but also that these ideas were clearly important in these QIPS.

The location of nodes labeled *FOLDER1_qa7 meeting* and *FOLDER1_qa7 exceeding* (Figure 7) shows how the two categories of services relate to each other. The size of the nodes on the map is an indication that, again, more services were in the one-step (Meeting NQS) category. The diametric positioning of the folder nodes again on the maps demonstrates significant differences between the QIPs in these different categories. Like the findings for QA1, the node for *FOLDER1_qa7 meeting* is at an even more pronounced distance from the overall map. This is not to suggest that the ideas in the QIPs are not present or developed by one-step improvers, only that in comparison to the two-step (Exceeding NQS) category, there seems to be less developed and explicit responses and planning in the QIPs.

Exploration of the conceptual pathways led to the emergence of Figure 7. One-step (Meeting NQS) category QIPs seem more focused

FIGURE 3
Quality Area 1 themed comparison of one-step and two-step improvement services.

on the process of planning and meeting standards and outcomes. Educators and staff were connected to concepts of *management, inductions* and *professional development*. The focus of the two-step (Exceeding NQS) category QIPS was shown to be more systemic: co-location of concepts related to leadership roles within the centre and information themes (*manager, nominated supervisor*) (Figure 7) suggests that there was a greater awareness of how service management supported the work of educators than was evident amongst than one-step improver services.

4. Discussion and conclusion

This study sought to identify the factors which contributed to different levels of quality improvement in QA 1 (Educational Program and Practice) and QA 7 (Governance and Leadership) in ECEC services, as evidenced in the QIPs created by a representative sample of Australian LDC services. *Leximancer 4.5* (Leximancer, 2018a) was used as a tool to analyze this documentary data. The QIP is a tool used to support the reflective planning and evaluation, and this evidence for intentional quality improvement. In this study

the QIPs demonstrated how the sophistication of thinking about the QAs and how this related to practice, management, and leadership in the LDCs contributed to greater levels of improvement in the A&R process.

Leximancer 4.5 provides visual mapping of key information from the QIPs in different visualization styles. This mapping enabled us to find patterns that supported comparison of two sets of QIPs, from the one-step (Meeting NQS) category and the two-step (Exceeding NQS) category by using automated classification of content rather than any pre-determined coding.

There are limits to the generalizability of these findings because of the specific nature of the sample to the Australian context. Although this research was limited and contextual, with the QIPs provided to us by ACECQA, the selected documents provided a representative sample of LDC services across Australia. The direction of this research project necessitated that we were only investigating two of the seven quality areas from a select sample, as discussed previously. Nevertheless, the study also provided some more generalizable findings.

Conceptual visualizations for QA1 of the QIPs reported children's learning and educator inputs were important concepts for improving

TABLE 2 *Leximancer 4.5* analysis of QIP Quality Areas 1 extracts, concepts and relevance percentage.

Concept	Relevance percentage
Educators	29
Children	28
Learning	27
Program	17
Outcome	16
Goal	16
Improvement	16
Plan	16
Identified	15
Notes	14
Children's	12
Families	12
Child	9
Key	8
Steps	8
Development	8
Success	7
Information	7
Staff	7
Experiences	7
Room	6
Educational	6
Leader	6
Time	6
Centre	5
Daily	5
Play	5
Quality	5
Day	5
Support	5
Parents	5
Ongoing	5
Activities	4
Early	4
Using	4
Environment	4
Practice	3
Times	3
Skills	3
Year	2
Philosophy	1

FIGURE 4
Concept map with highlighted conceptual pathways: comparison of one-step and two-step improvement services for Quality Area 1.

FIGURE 5
Concept map QA7, comparison of one-step and two-step improvement services.

quality. As can be seen in the mapping which showed the direct pathways between children, learning and educators. This showed staff, children, and families close to these concepts of *children* and l*earning*
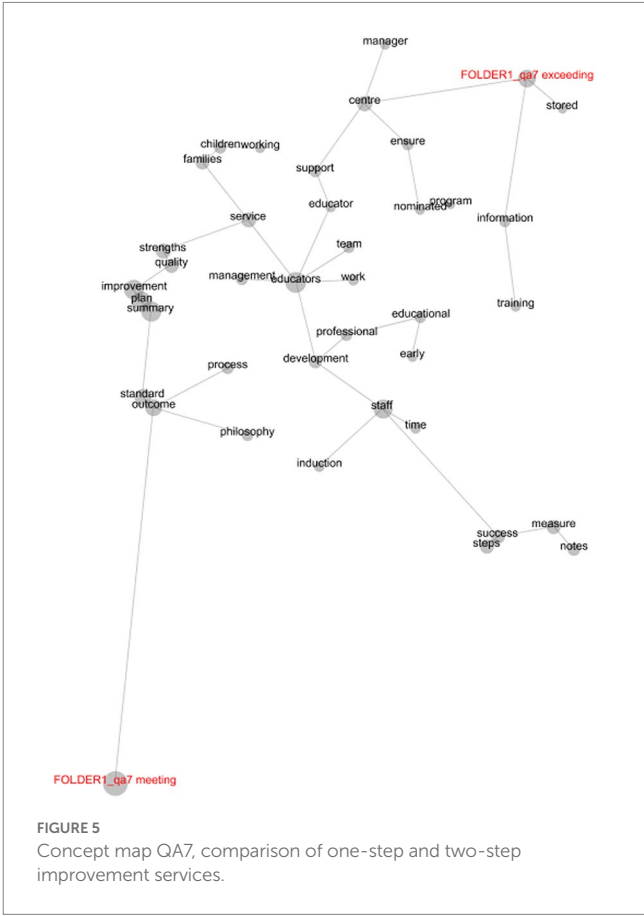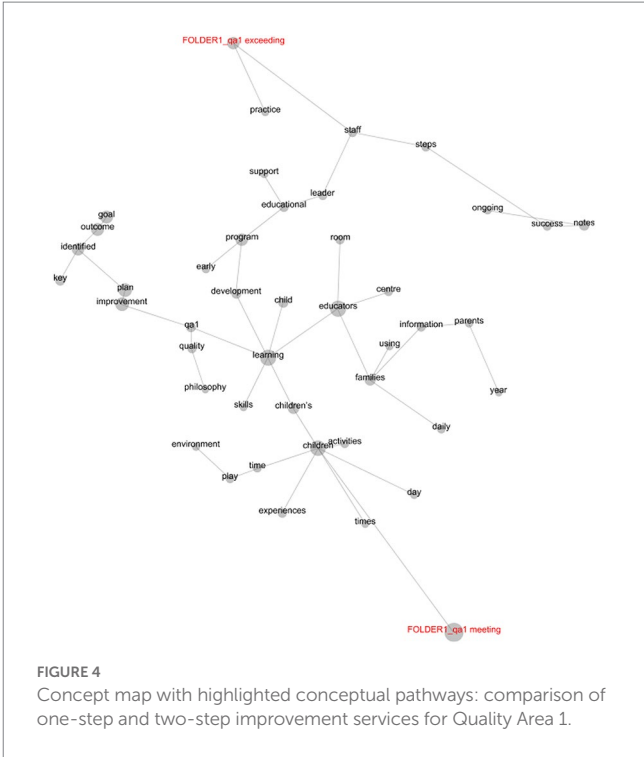
indicating contributions to children's learning in ECEC. It was clear that ECEC services which went from working toward to Meeting NQS (blue lines) placed more emphasis on the everyday routines and

FIGURE 6
Quality Area 7, themed comparison of one-step and two-step improvement services (35%).
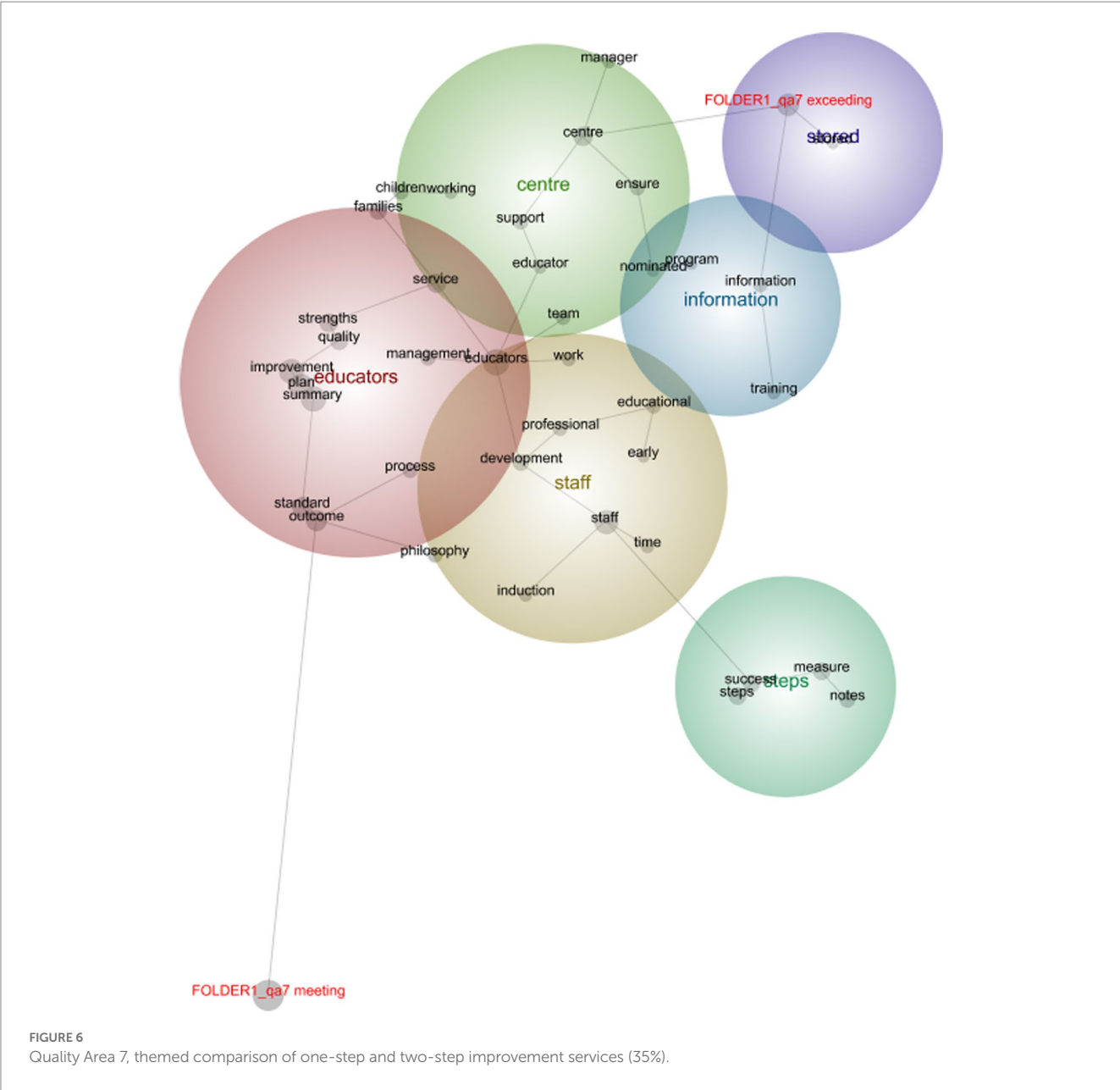
TABLE 3 QA1 thematic synopsis of one-step and two-step (Exceeding NQS) category improvement services.

Theme	Hits	Heat mapping
Educators	1386	
Program	932	
Improvement	643	
Experiences	511	
Information	496	
Notes	426	
Steps	351	
Daily	296	
Practice	87	

The themes are heat-mapped, meaning that hot colours (red, orange) denote the most important themes, and cool colours (blue, green), denote those less important.

learning experiences. ECEC services increased their rating to Exceeding NQS (red lines), had different priorities and focused more on the educational leader moving beyond the routines and learning within the program. These educational leaders were supported by the management of the organization with additional time and support which suggests management and leadership within these organizations recognized the importance and significance of the educational leader's role and pedagogical leadership in relation to program development and children's learning found in research (Sims et al., 2017; Halttunen et al., 2019).

Concept visualizations of the QA 7 QIP provided a different focus, whereby concepts of *educators, management*, and *professional development* were found. In ECEC services which improved from working toward to Meeting NQS, the management of staff, as well as inductions and professional learning were located close to educators and staff. However, services which

FIGURE 7
Concept map with highlighted pathways for QA7, comparison of one-step and two-step improvement services.
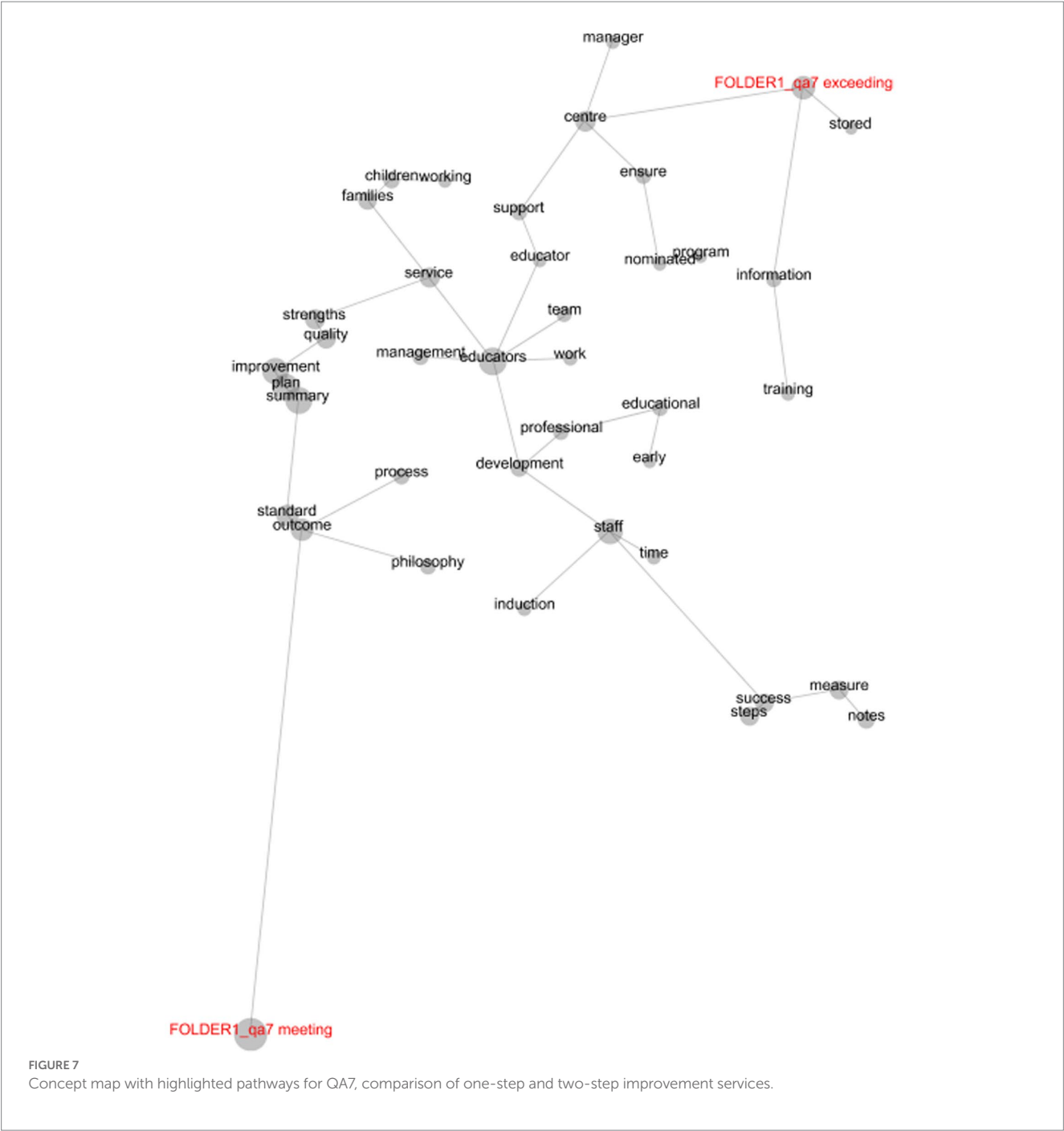
TABLE 4 QA7 thematic synopsis of comparison of one-step and two-step (Exceeding NQS) category improvement services.

Theme	Hits	Heat mapping
Educators	1050	
Staff	860	
Centre	697	
Steps	339	
Information	312	
Stored	71	

The themes are heat-mapped, meaning that hot colours (red, orange) denote the most important themes, and cool colours (blue, green), denote those less important.

increased their rating to Exceeding had a more systemic approach. This encompassed how the service management and related information supported educators, with much stronger links to leadership roles involving the manager and/ or nominated supervisor, with concepts directly related to management roles, training, support, and information.

These research findings, using the representative sample of Australian ECEC services, show that quality improvement is the result of collaborative effort, and shared responsibility. The results emphasize the importance of leadership in service delivery to improve quality. Requiring organizational leadership, support, and resourcing for educators. Such commitment requires the

recruitment and retention of qualified and skilled early childhood educators alongside, support for professional learning, resourcing of the learning environment and the creation of a positive work environment and conditions that promote and enable professional practice (Irvine et al., 2016; Cumming et al., 2021; McFarland et al., 2022). Organizational leadership and support are necessary to develop educator agency and decision-making thus supporting the quality within programs and practices (Howes et al., 2008; Mathers et al., 2012; LeeKeenan and Ponte, 2018). The ECEC services who made the leap to a two-step improvement to an Exceeding rating in both QA1 and QA7 demonstrated an awareness of the need to support and lead staff at all levels within the service. In particular, the role of the educational leader was highlighted in these services as an important and necessary role in leading learning and development in these areas, and ensuring this learning is visible in-service planning through the QIP.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Author contributions

All authors listed have made a substantial, direct, and intellectual contribution to the work and approved it for publication.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Macro-structural predictors of Australian family day care quality

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Introduction: This study explores the predictive power of macro-structural characteristics on quality rating and improvement system (QRIS) outcomes of Family Day Care (FDC) services in Australia.

Methods: The dataset consisted of 441 FDC National Quality Standard (NQS) ratings from all Australian states and territories, with overall ratings of Exceeding NQS, Meeting NQS, Working Towards NQS, or Significant Improvement Required.

Results: Multinomial logistic regressions confirmed that management type, community socioeconomic status (SES), level of urbanization, and government jurisdiction explained 6.9 to 19.3% of the variation in QRIS outcomes. Results indicated that lower FDC NQS ratings were more likely for (1) private for-profit vs. not-for-profit; (2) low-SES vs. high-SES area; and (3) regional or remote area vs. metropolitan. State/territory jurisdiction also influenced NQS ratings.

Discussion: These findings imply the need for policy attention to inequalities in FDC quality associated with systemic and organizational differences. Greater effort is needed to promote equality and equity in FDC services.

KEYWORDS

family day care, national quality framework, systemic features, early childcare, QRIS

Introduction

Early childhood education and care (ECEC) attendance can positively affect young children's early learning and development, academic success, and socioeconomic mobility (1). Family Day Care (FDC), also known as family child care, is a globally accessed form of ECEC. FDC is family-based, allowing educators to care for children in their own homes, and children to attend with siblings, including those attending primary school (2). FDC educators care for over 125,000 children in Australia (3). Yet, FDC has consistently received lower ratings than other types of education and care on an Australian quality rating and improvement system (QRIS), the National Quality Standard (NQS) Assessment and Rating system [Australian Children's Education & Care Quality Authority (4)].

Multiple layers of structure, deemed "macro-structural" variables by Harrison et al. (5), may influence ECEC quality (5, 6). The layers of structure that predict ECEC quality have been identified as systemic, organizational, classroom, and staff (7). Unfortunately, few studies have examined how macro-structural features might predict quality childcare provision. To fill this gap, this research aims to explore the predictive power of three systemic characteristics (community socioeconomic status (SES), level of urbanization, government jurisdiction) and one organizational characteristic (management type) on QRIS outcomes in a national sample of Australian FDC services.

Australian family day care and the national quality standard

Australian FDC educators are self-employed providers of regulated home-based ECEC and are registered with and supported by the coordination units of approved FDC schemes (8). Educators can care for up to seven children, including their own, with a maximum of four children under school age, in their FDC residence or approved venue. FDC schemes employ coordinators and fieldworkers to provide operational support and monitor the uptake of regulations and quality assurance standards (9, 10). Currently, Australia's 500 FDC schemes make up 4% of education and care services (3, 11).

Education and care services have been assessed against the NQS since 2012. The NQS sets a national quality benchmark for publicly funded education and care services in Australia. It is part of the National Quality Framework (NQF), a unified national system for education and care introduced in 2008 (12). Service quality is assessed against seven quality areas (QAs), each underpinned by a set of standards and elements, and an overall NQS rating. Of particular importance to educator stakeholders are QA 1 (educational program and practice) and QA 5 (relationships with children). QA 1 emphasizes curricula process quality while QA 5 emphasizes building responsive and respectful relationships with children (4). The role of family and community stakeholders are reflected through QA6 (collaborative partnerships with families and communities). QA 6 emphasizes active communication, consultation and collaboration between FDC schemes with families and communities. The NQS comprises four ratings: (1) Significant Improvement Required (SIR); (2) Working Towards NQS (WT); (3) Meeting NQS (MEET); and (4) Exceeding NQS (EXCEED). A rating of "Excellent" is available upon application to services that score EXCEED in all seven QAs (4).

Macro-structural characteristics

The importance of ECEC quality has led to a plethora of research into factors that predict quality (e.g. (13, 14),). Structural indicators (educator-to-child ratios; group size; educator qualifications) are the primary drivers of process quality (7, 15). In Australia, consistency of educator-to-child ratios, group size, and educator qualifications is ensured across all eight states and territory jurisdictions by the NQF (16).

Management type

For-profit ECEC services are generally reported to be lower quality than not-for- profit services (5, 17–20). Cleveland and Krashinsky (19) theorized that the lower quality of care for for-profit services was due to thick and thin markets, resulting from high and low levels of middle- and upper-income families in the local area, respectively. Thick markets have been theorized to support investment in higher quality from not-for-profit service providers through choices relating to lower child–staff ratios, better-educated staff and directors, higher fees and higher rates of professional development for staff (19).

Community socioeconomic status

Low SES levels have been theorized to be correlated with thin markets, resulting in lower ECEC quality (19). Significantly less availability of ECEC in low SES areas and a lower average quality of care have been reported in low SES neighborhoods than in more advantaged neighborhoods (21). Lower proportions of children receiving public childcare subsidies has been associated with higher global quality in a study of FDC services in four American States (22). In Australia, demand for ECEC services was more likely to outpace local supply in low SES areas as compared to high SES areas (23). Community SES was found to indirectly influence access to ECEC quality (24).

Level of urbanization

Research has indicated that rural areas offer lower-quality education and care services than urban areas (25, 26). For example, a shortage of qualified teachers affects ECEC service quality in rural Vietnam (27). In addition, kindergartens in rural areas of Zhejiang province in China had problems recruiting high-quality teachers and funding the purchase of furnishings, equipment, and educational materials (28). In Australia, NQS assessment and rating records indicate that ECEC services in metropolitan regions receive higher ratings than services in regional or remote areas of Australia (4). Similarly, ECEC services supply is generally higher in metropolitan regions than that in regional and remote Australia (23). There was a complete absence of ECEC supply in many regional towns in Australia, for instance, about 360 towns with a population under 1,500 did not have a center-based day care (23). This demand–supply gap of ECEC in Australia may be linked to the quality differences.

Government jurisdiction

Regulatory differences between state government jurisdictions have influenced ECEC quality in the United States of America (22, 29). For example, a study of 120 FDC services in Kansas, Nebraska, Missouri, and Iowa linked different regulatory requirements with different FDC quality levels (22). The state the ECEC service was located in was a significant predictor of observed quality as measured by total scores on the Family Day Care Rating Scale (30) and the subscale scores for Tone and Discipline and Provisions for Learning and Health (29). Within Australia, NQS records and research into center-based ECEC services have revealed varying levels of quality and quality improvement for different states and territories (4, 5).

Study aims

This study aimed to examine the influences of these four macro-structural characteristics on differences in FDC quality as assessed through Australia's NQS A&R system. An overall rating of "SIR" or "WT" indicates lower levels of quality. "MEET" means that all standards have been met, while a rating of "EXCEED" indicates higher levels of quality. An overarching question about whether macro-structural factors predict FDC quality was operationalized into three analysis questions:

Do management type, SES, level of urbanization, and jurisdiction predict the likelihood of an FDC scheme…

1. attaining a rating of "WT"/"SIR" vs. a rating of "MEET"?
2. attaining a rating of "WT"/"SIR" vs. a rating of "EXCEED"?
3. attaining a rating of "MEET" vs. a rating of "EXCEED"?

Method

Population

The study used Australia's national data repository of NQS ratings to undertake secondary data analysis. Data for 441 FDC schemes in Australia that had completed an NQS assessment by December 2020 (11) were analyzed. The ACECQA repository also included management and location information about the FDC scheme.

Measures

Quality ratings

The overall quality of each scheme was assessed following the NQS assessment and rating process as:

(1) *Significant Improvement Required*: Service does not meet 1 of the 7 QAs or a section of the legislation, and there is a significant risk to the safety, health, and wellbeing of children. The regulatory authority will take immediate action;
(2) *Working Towards NQS*: Service provides a safe education and care program. There are one or more QAs identified for improvement;
(3) *Meeting NQS*: Service provides quality education and care in all seven QAs;
(4) *Exceeding NQS*: Service goes beyond the requirements of the NQS in at least four of the seven QAs.

Frequency analysis for the assessed 441 schemes showed that only 4 (0.9%) schemes had received an overall NQS rating of "SIR," 209 (47.4%) schemes received a rating of "WT," 170 (38.5%) schemes received a rating of "MEET," and 58 (13.1%) schemes received a rating of "EXCEED."

NQS version

Of the 441 FDC schemes, 205 (46.5%) had been assessed under the original 2012 version of the NQS, and 236 (53.5%) had been assessed with the 2018 version.

Management type

Management type for the FDC schemes was identified by four categories: (1) for-profit; (2) not- for-profit – community-based organizations; (3) not-for-profit – other organizations; and (4) not-for-profit - local government. Frequency analysis showed that for-profit FDC schemes were the largest management type ($n = 248$, 56.2%), followed by local government FDC schemes ($n = 79$, 17.9%), community-based FDC schemes ($n = 72$, 16.3%), and FDC schemes run by other not-for-profit organizations ($n = 42$, 9.5%).

Community socioeconomic status

Community SES was measured by the Socioeconomic Indexes for Areas (SEIFA) which is a composite of four indexes, including two indexes of advantage, one of education and occupation, and one of economic resources (31). Higher positions on the SEIFA quintiles (level 5) denote more elevated levels of advantage than lower positions (level 1) (31). The majority of FDC schemes were located in communities with SEIFA quintile 1 ($n = 181$, 43.5%), followed by quintile 2 ($n = 88$, 21.2%), quintiles 3 and 4 ($n = 58$, 13.9% each), and quintile 5 ($n = 31$, 7.5%). The remaining 25 FDC schemes were not matched to a SEIFA level.

Level of urbanization

The level of urbanization was measured by the Accessibility and Remoteness Index of Australia (ARIA+) which represents a general access model covering education, health, shopping, public transport, and financial/postal services (32). ARIA+ levels of urbanization are based on road distance from over 12,000 population localities across Australia to the nearest service center locality based on population size, which is used as a proxy measure of service availability (33). ARIA+ identifies five categories: (1) Major Cities (populations of approximately 250,000 persons or more); (2) Inner Regional cities or towns (populations of approximately 48,000 to 249,999 persons); (3) Outer Regional towns (populations of approximately 18,000 to 47,999 persons); (4) Remote townships (populations of approximately 5,000 to 17,999 persons); (5) Very Remote areas (populations of approximately 1,000 to 4,999 persons). The majority of FDC schemes were located in major cities ($n = 300$, 68.0%), followed by inner regional ($n = 88$, 20.0%), outer regional ($n = 47$, 10.7%), remote ($n = 4$, 0.9%), and very remote ($n = 2$, 0.4%) areas of Australia.

Jurisdiction

There are eight government jurisdictions in Australia: six states, New South Wales, Victoria, Queensland, Western Australia, South Australia, Tasmania, and two territories, Australia Capital Territory (ACT) and Northern Territory. New South Wales had the most FDC schemes ($n = 147$, 33.3%), followed by Victoria ($n = 133$, 30.2%), Queensland ($n = 100$, 22.7%), Western Australia ($n = 30$, 6.8%), South Australia ($n = 12$, 2.7%), Tasmania ($n = 10$, 2.3%), ACT ($n = 6$, 1.4%), and the Northern Territory ($n = 3$, 0.7%).

Analysis plan

Cross-tabulations were conducted to assess the distribution of FDC quality ratings for each of the four macro-structural characteristics and the NQS version (2012 vs. 2008). Regression analysis was employed to examine the influences of each macro-structural characteristic on FDC quality. Because the outcome variable was categorical, we chose multinomial logistic regression (MLR), which predicts the probability that an observation falls into one of three or more categories of a dependent variable (DV) based on one or more independent variables (IVs) (34). The IVs can be either continuous or categorical.

For our final analyses, we conducted two sets of MLRs using the 3-category DV. The first tested the likelihood of each macro-structural characteristic predicting a rating of WT/SIR versus a rating of (1)

MEET and (2) EXCEED. The second set of MLRs used "MEET" as the reference category to test the predictive effects of each of the four macro-structural characteristics predicting a rating of "MEET" versus (1) "EXCEED" and (2) "WT"/ "SIR." The validity of the models was tested with a chi-square test and confirmed with Pearson's goodness of fit test. The nagelkerke R^2 (a pseudo R^2) was used to estimate the variation in overall NQS rating scores explained by the model (35). Finally, Odds Ratios (ORs) were used to determine the nature of the predictive effects for the IVs within each model. The Odds Ratio (OR) computes the chances of a particular event happening in comparison to the event not happening (36). To fully explore the contrasts (ORs) within each IV, MLRs were repeated with different reference categories: three MLRs for management type, four for SES, two for the level of urbanization, and three for jurisdiction.

The version of the NQS (2012/2018) was included as a covariate. This increased the number of statistical tests, with a corresponding increase in the potential for a Type I error (i.e., a false positive). A Type I error risk was accounted for by dividing the standard critical value of 0.05 by two, the total number of predictor variables, to yield a critical value of 0.025 (37).

Results

Descriptive analysis

The distribution of FDC schemes across the four NQS quality ratings by each macro-structural characteristic and the NQS version are presented in Table 1. In terms of management type, results indicated that a higher proportion of private for-profit FDC schemes received ratings of "WT" (61.7%) compared to community-based not-for-profit FDC schemes (30.6%), FDC schemes managed by other not-for-profit organizations (26.2%) or FDC schemes local government-provided FDC (29.1%). Conversely, results suggested that private for-profit FDC schemes were less likely to achieve a rating of "MEET" or "EXCEED" (32.3 and 5.2%, respectively) than community-based not-for-profit FDC (50.0 and 18.1%), FDC schemes managed by other not- for-profit organizations (50.0 and 21.4%) or FDC schemes managed by local government, such as city councils (41.8 and 29.1%).

The pattern of distributions of NQS ratings across the five SEIFA levels suggested an association between quality and community SES. A lower proportion of FDC schemes located in more disadvantaged communities (SEIFA quintiles 1 and 2) were rated as "EXCEED" (12.2 and 11.4%, respectively) compared to FDC schemes located in SEIFA quintiles 4 and 5 (22.4 and 25.8%). However, there was inconsistent evidence of a linear relationship: for example, only 5.2% of FDC schemes located in SEIFA quintile 3 were rated as Exceeding NQS.

Results for the level of urbanization indicated that FDC schemes located in major cities were more likely to be rated as "WT" (53.0%) than FDC schemes in inner regional and outer regional areas (35.2 and 34.0%, respectively). The converse pattern was evident for ratings of "MEET," which were more evident in regional areas (inner = 45.5%; outer = 51.1%) than in cities (34.3%).

The results for jurisdiction suggested some differences between the states. FDC schemes in Queensland had a lower proportion of "WT" ratings (35.0%) than FDC schemes in New South Wales (46.9%), Victoria (52.6%), Western Australia (73.3%) and South

Australia (66.7%), and a higher proportion of "Exceeding NQS" (19.1 vs. 10.2%, 10.5 and 8.3% for New South Wales, Victoria, and South Australia, respectively).

Results also showed differences for FDC schemes assessed under the 2012 and 2018 versions of the NQS. While similar proportions of schemes received a "WT" rating (47.8 and 47.0%, respectively), "EXCEED" ratings were less likely (7.6 vs. 19.5%), and "MEET" ratings were more likely (43.6 vs. 32.7%) for 2018 versus the 2012 version.

Preliminary results

A multiple regression model may be invalid due to the existence of categorical variables in the study. A number of preliminary analyses were conducted to confirm the viability of a multiple regression analysis.

Possible differences in quality ratings based on the NQS version used were tested for. A preliminary MLR was conducted with the 2012 vs. 2018 version of the NQS as the IV and the overall NQS rating as the dependent variable. The model was statistically significant, $\chi^2(2) = 15.416$, $p < 0.001$. The version of the NQS was subsequently entered as a covariate in the MLRs for each of the four macro-structural characteristics. Next, we tested for model validity. For an MLR model to be valid: (1) there should be few covariate patterns with expected cell frequencies of zero; and (2) the proportion of expected cell frequencies greater than 5 should be 80% or more (34). Our preliminary analysis using the 4-category DV revealed multiple covariate patterns with expected frequencies of zero. In particular, we found that including the SIR rating led to covariate patterns with expected cell frequencies of zero. To avoid this problem, we combined the four FDC schemes with a "SIR" rating with schemes rated as "WT." The combined "WT"/"SIR" category, therefore, consists of all FDC schemes that failed to meet at least one NQS element.

Our preliminary analyses also showed that entering more than one macro-structural predictor (IV) in the regression model resulted in invalid models. To create more trustworthy models, we reduced the number of categories for level of urbanization and jurisdiction. The three levels of urbanization with the highest remoteness levels – outer regional Australia ($n = 47$), remote Australia ($n = 4$), and very remote Australia ($n = 2$), were combined into a single category. For jurisdiction, the five states and territories with the lowest numbers of FDC schemes – Western Australia ($n = 30$), South Australia ($n = 12$), Tasmania ($n = 10$), ACT ($n = 6$), and NT ($n = 3$), were combined into a single sub-category. When the MLR was repeated with the new sub-categories, the models were valid. MLR was thus an appropriate method of analysis.

Multinomial logistic regression

Results for the MLR models for each of the four macro-structural characteristics - management type, community SES, level of urbanization, and jurisdiction, all achieved statistical significance, explaining 19.3, 9.2, 6.9, and 7.8% (Nagelkerke R^2) of the variance in overall NQS ratings, respectively (see Table 2).

Management type had a moderate effect on FDC quality, $\chi^2(8) = 80.31$, $p < 0.001$, Pearson's $\chi^2(6) = 8.89$, $p = 0.180$,

TABLE 1 Distribution of overall NQS quality ratings by macro-structural characteristics and NQS version.

	All FDC schemes		Significant improvement required		Working towards NQS		Meeting NQS		Exceeding NQS	
	n	%	n	%	n	%	n	%	n	%
Management type										
Private for-profit	248	56.2	2	0.8	153	61.7	80	32.3	13	5.2
Not-for-profit – community-based	72	16.3	1	1.4	22	30.6	36	50.0	13	18.1
Not-for-profit other organizations	42	9.5	1	2.4	11	26.2	21	50.0	9	21.4
Not-for-profit local government	79	17.9	0	0.0	23	29.1	33	41.8	23	29.1
Quintile 1	181	43.5	1	0.6	91	50.3	67	37.0	22	12.2
Quintile 2	88	21.2	1	1.1	44	50.0	33	37.5	10	11.4
Quintile 3	58	13.9	0	0.0	21	36.2	34	58.6	3	5.2
Quintile 4	58	13.9	0	0.0	24	41.4	21	36.2	13	22.4
Quintile 5	31	7.5	1	3.2	11	35.5	11	35.5	8	25.8
Level of Urbanization										
Major cities in	300	68.0	2	0.7	159	53.0	103	34.3	36	12.0
Australia Inner regional	88	20.0	1	1.1	31	35.2	40	45.5	16	18.2
Australia Outer regional	47	10.7	1	2.1	16	34.0	24	51.1	6	12.8
Australia Remote Australia	4	0.9	0	0.0	3	75.0	1	25.0	0	0.0
very remote Australia	2	0.5	0	0.0	0	0	2	100.0	0	0.0
Jurisdiction New South Wales	147	33.3	2	1.4	69	46.9	61	41.5	15	10.2
Victoria	133	30.2	1	0.8	70	52.6	48	36.1	14	10.5
Queensland	100	22.7	0	0.0	35	35.0	46	46.0	19	19.0
Western Australia	30	6.8	0	0.0	22	73.3	3	10.0	5	16.7
South Australia	12	2.7	0	0.0	8	66.7	3	25.0	1	8.3
Tasmania	10	2.3	1	10.0	4	40.0	3	30.0	2	20.0
ACT	6	1.4	0	0.0	1	16.7	4	66.7	1	16.7
NT	3	0.7	0	0.0	0	0	2	66.7	1	33.3
NQS Version										
2012	205	46.5	0	0.0	98	47.8	67	32.7	40	19.5
2018	236	53.5	4	1.7	111	47.0	103	43.6	18	7.6

$R^2 = 0.193$. Significant Odds Ratios were evident for all three MLR comparisons. These are summarized using for-profit FDC as the reference category in Table 2. Results showed that for-profit schemes were more likely to be rated "WT"/"SIR" compared to "MEET" than community-based not-for-profit FDC schemes (OR = 2.96; $p < 0.001$), FDC schemes managed by other not-for-profit organizations (OR = 3.35; $p = 0.002$), and local government managed FDC (OR = 2.74; $p = 0.001$). For-profit FDC schemes were also more likely to be rated "WT"/"SIR" compared to "EXCEED" than community-based not-for-profit FDC schemes (OR = 8.86; $p < 0.001$), FDC schemes managed by other not-for-profit organizations (OR = 10.01; $p < 0.001$), and local government FDC schemes (OR = 13.88; $p < 0.001$). For-profit FDC schemes were more likely to be rated "MEET" compared to "EXCEED" than community-based not-for-profit FDC schemes (OR = 2.99; $p = 0.017$), and local government FDC schemes (OR = 5.06; $p < 0.001$).

Community SES had a small but significant effect on FDC quality ratings, $\chi^2(10) = 34.29$, $p < 0.001$; Pearson's $\chi^2(8) = 6.74$, $p = 0.565$, $R^2 = 0.092$. All five levels of SES (SEIFA quintiles 1 to 5) were tested as the reference category in a series of MLR tests to explore the overall effect. Results are summarized for Odds Ratio comparisons for quintile 3, the mid-point, in Table 2. Significant Odds Ratios were evident for two MLR comparisons. FDC schemes in quintile 3 were less likely to be classified as "WT"/"SIR" compared to "MEET" than FDC schemes in quintile 1 (OR = 0.44; $p = 0.011$) and more likely to be classified as "MEET" compared to "EXCEED' than FDC schemes in quintile 4 (OR = 7.86; $p = 0.004$), and SEIFA quintile 5 (OR = 7.88; $p = 0.007$).

Level of urbanization had a small effect on FDC quality ratings, $\chi^2(6) = 27.19$, $p < 0.001$, Pearson's $\chi^2(4) = 7.70$, $p = 0.103$, $R^2 = 0.069$. Results are summarized using major cities of Australia as the reference

TABLE 2 Results of multinomial logistic regression tests for each macro-structural characteristic.

Macro-structural characteristics (IV)		WT/SIR vs. EXCEED	WT/SIR vs. EXCEED	MEET vs. EXCEED
		Model R^2 and Odds Ratios	Model R^2 and Odds Ratios	Model R^2 and Odds Ratios
Management type				
		$R^2 = 0.193$	$R^2 = 0.193$	$R^2 = 0.193$
Reference cat Private for-profit	Not-for-profit community based	2.96***	8.86***	2.99*
Not-for-profit other Organization		3.35**	10.10***	3.01
Not-for-profit local government		2.74**	13.89***	2.23***
SES				
		$R^2 = 0.092$	$R^2 = 0.092$	$R^2 = 0.092$
Reference cat Quintile 3	Quintile 1	0.44*	1.82	4.12
	Quintile 2	0.45	1.63	3.62
	Quintile 4	0.53	4.12	7.86**
	Quintile 5	0.57	4.50	7.88**
Urbanization level				
		$R^2 = 0.069$	$R^2 = 0.069$	$R^2 = 0.069$
Reference cat Major cities	Inner regional Australia	1.94*	2.30*	1.19
	Outer regional + remote + very remote Australia	2.05	1.54	0.76
State/Territory Jurisdiction		$R^2 = 0.078$	$R^2 = 0.078$	$R^2 = 0.078$
Reference cat Queensland	New South Wales	0.63	0.46	0.73
	Victoria	0.53	0.33**	0.62
	Western Australia + South Australia + Tasmania + ACT + Northern Territory	0.32*	0.50	1.56

*$p < 0.025$, **$p < 0.01$, ***$p < 0.001$.

category. FDC schemes in major cities of Australia were significantly more likely to be (1) rated "WT"/"SIR" compared to "MEET" and (2) rated "WT"/"SIR" compared to "EXCEED" than schemes in inner regional Australia (ORs = 1.94; $p = 0.014$, and 2.30; $p = 0.022$), respectively.

Government jurisdiction showed a small but significant difference in FDC quality ratings [$\chi^2(8) = 30.66$, $p < 0.001$; Pearson's $\chi^2(6) = 8.66$, $p = 0.193$, $R^2 = 0.078$] based on our four-level categorization that compared New South Wales, Victoria, Queensland and combined group of five jurisdictions. While all categories were tested as the reference category in a series of MLR tests, Odds Ratios results are summarized for Queensland as the comparison state. FDC schemes managed by Queensland were less likely to be rated "WT"/"SIR" compared to "MEET" than FDC schemes managed by the combined group (OR = 0.32; $p = 0.003$), and less likely to be rated "WT"/"SIR" compared to "EXCEED" than FDC schemes managed by Victoria (OR = 0.33; $p = 0.007$). In addition, MLR results using Victoria as the reference category showed that FDC schemes managed by Victoria were more likely to be rated "WT"/"SIR" compared to "MEET" than the combined FDC schemes managed by the combined group (OR = 3.13;

$p = 0.003$). MLR results for New South Wales as the reference category indicated no differences in quality ratings for jurisdiction.

Discussion

The study results provide clear evidence that macro-structural characteristics predicted differences in FDC quality. This section will discuss these findings and their implications for process quality.

Management type

For-profit FDC schemes had lower quality ratings than all three types of not-for- profit FDC schemes. The magnitude of the difference between for-profit and not-for-profit FDC services analyzed in this study was surprising. 60% of for-profit FDC schemes failed to meet the National Quality Standard, over twice the rate for not-for-profit schemes. This gap between for-profit and not-for-profit FDCs is of

particular concern, as for-profit FDC schemes make up over 56% of all FDC schemes in Australia.

Market forces has been suggested to explain the difference in quality by management type. The thick and thin market theory of childcare quality posits that middle- to upper-income families may influence quality through market forces, with better child-to-staff ratios and higher fees (19). However, this theory holds key assumptions that differ from the Australian FDC context. Australia's National Quality Framework ensures that child-to-staff ratios are consistent across FDCs. Furthermore, government subsidies are available to parents for all FDCs regardless of management type.

Differences in quality has been suggested to arise from differences in educators' rates of pay. For-profit providers of center-based services pay educators lower rates and are less likely to attract highly-qualified and well- experienced staff than not-for-profit providers. They also pay high salaries for executives and dividends to shareholders (38). Applying these findings to FDC may explain the for-profit/not-for-profit quality gap. For-profit FDC schemes may pay coordinators and fieldworkers lower wages than not-for-profit providers and direct profits to the executives, shareholders, and/or owners rather than to the resourcing and support of FDC educators.

Community socioeconomic status

A general pattern of FDC schemes located in lower SES communities having lower NQS ratings and FDC schemes in communities of higher SES having higher ratings was found. The findings were similar to that of other research [e.g., (5, 21)]. This pattern could be explained by the theory of concentrated affluence and concentrated disadvantage (39). Areas of concentrated affluence are defined by having many families earning more than $100,000 annually and having a member with at least a Bachelor's degree. On the other hand, areas of concentrated disadvantage have high levels of unemployment and a high proportion of families living in poverty (40). FDC educators residing in communities with higher concentrated affluence may be more likely to have tertiary qualifications and be more invested in providing higher-quality programs. Likewise, families with tertiary qualifications and higher incomes may purposely seek higher-quality FDC homes and thus create demand for them.

Level of urbanization

The present study found that FDC schemes in regional areas of Australia attained higher levels of quality than services in metropolitan areas. This finding contrasts with previous studies reporting higher quality ECEC in metropolitan areas for kindergartens and LDC centers (4, 25, 41). The difference for FDC quality may be explained, in part, by the higher level of accessibility to FDC in regional and remote Australia: 28% of the Australian population live in regional and remote areas of Australia (42), and 24.3% of FDC educators operate in the same regions (3). In addition, FDC may be the only option for child care in regional and remote areas of Australia (3). In contrast, households in

metropolitan Australia are more likely to experience multiple challenges accessing child care (e.g., lack of quality, center location, and center choice) than households in regional Australia or remote Australia (43).

State/territory government jurisdiction

Finally, our findings also identified jurisdiction as a predictor of FDC quality. FDC schemes in Queensland were generally found to be of higher quality than FDC schemes other jurisdictions, with the exception of NSW. Since 2012, all states and territories have been expected to adhere to national guidelines for quality; however, before the reforms introduced in 2012, there were disparities in standards and administrative processes for the child-to-staff ratios and educators' qualifications. It may be that these prior distinctions continue to affect current levels of quality.

Process quality

Overlap between the NQS Quality Areas (QAs) and standardized assessments of quality has been reported by Siraj et al. (44) who found associations between QA 1 (education program and practice) and QA 5 (relationships with children) and independent ratings on the Sustained Shared Thinking and Emotional Wellbeing (SSTEW) scale. QA 1 assesses educators against their use of child-centered opportunities, intentional teaching, responsive teaching, and child directed learning: areas that emphasize curriculum quality. QA 5 assesses educators against their interactions with children, promotion of collaborative learning, and promotion of child self-regulation (4). Given that MLR tests explained between 6.9 and 19.3% of variation in NQS overall ratings, the findings from this study suggest that (1) curriculum quality; and (2) relationships with children are significantly associated with macro-structural characteristics of the FDC services. If so, these findings suggest that improvements in process quality may be best served through a holistic approach emphasizing direct interventions at the FDC service level in combination with indirect macro-structural interventions.

Limitations

While our use of a publicly available, large, national data set to examine macro-structural differences in FDC quality has made a unique contribution, these data have inherent limitations. FDC assessment and rating is conducted in a sample of FDC homes that are expected to represent the large number of individual FDC homes in each scheme. A further limitation is that, unlike in the U.S., the assessment process does not use of standardized observation instruments and, while accepted as conceptually sound (45, 46), only one validation of the NQS ratings has been conducted (44). To our knowledge, no validation study of FDC ratings has been undertaken in Australia. A further limitation is that FDC schemes include educators over wide geographical areas (47). The SEIFA score assigned to FDC schemes may not necessarily match the SEIFA of individual FDC educators.

Second, the small numbers of schemes in Western Australia, South Australia, Tasmania, the ACT, and Northern Territory were combined into one group to ensure valid regression models, but this was not a coherent group. Our initial analyses (summarized in Table 1) showed differences in the distribution of FDC quality within these five states/territories. Conducting MLRs with categorical outcomes and predictors also limited our ability to test and compare the combined effects of the four macro-structural variables and covariates simultaneously in a multivariable regression.

Conclusion

Given that FDC is a widely utilized yet seldomly researched form of ECEC, the potential offered by Australia's NQS dataset has realized important findings. The Australian NQS is unique in applying a universal quality improvement and rating system across all jurisdictions. It is also tied to standardized regulations for child-educator ratios, educator qualifications, and the Australian government's childcare fee subsidy system. The NQS is a relatively novel measure of quality in FDC, about which relatively little is known from a research perspective. This study contributes to ongoing research about macro-structural characteristics that predict FDC quality and research about predictors of NQS quality indicators. Findings imply that policy attention should be paid to the variations and inequalities linked to macro-structural characteristics to promote equality and equity in FDC services.

Data availability statement

Publicly available datasets were analyzed in this study. This data can be found at: acecqa.gov.au.

Author contributions

This article reports VC's postgraduate study, co-supervised by LH and HL, at Macquarie School of Education, Macquarie University. All authors contributed to the article and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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The quest for continuous quality improvement in Australian long day care services: getting the most out of the Assessment and Rating process

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The National Quality Framework (NQF) was intended to drive continuous improvement in education and care services in Australia. Ten years into implementation, the effectiveness of the NQF is demonstrated by steady improvements in quality as measured against the National Quality Standard (NQS). The process of assessing and rating services is a key element in the NQF, drawing together regulatory compliance and quality assurance. This paper draws on findings from a national Quality Improvement Research Project investigating the characteristics, processes, challenges and enablers of quality improvement in long day care services, concentrating on Quality Area 1 Educational program and practice and Quality Area 7 Governance and leadership. This was a mixed-method study focusing on long day care services that had improved their rating from Working toward NQS to Meeting NQS or to Exceeding NQS. The study comprised three phases, and in this paper, we draw on Phase 3 to understand the contribution of the NQS Assessment and Rating (A&R) process to continuous quality improvement from the standpoint of providers and professionals delivering these services. Phase 3 involved qualitative case studies of 15 long day care services to investigate factors that enabled and challenged quality improvement. Data was collected during two-day site visits, using professional conversations and field notes to elicit the views and experiences of service providers, leaders and educators. In this paper, we look at how the A&R process is experienced by those involved in service provision, with a focus on the factors that enabled and challenged quality improvement. Recognizing the interchangeability of enablers and challenges, three broad themes emerged: (i) curriculum knowledge, pedagogical skills and agency; (ii) collaborative leadership and teamwork; and (iii) meaningful engagement in the A&R process. The study found that meaningful engagement in the A&R process informed priorities for ongoing learning and acted as a catalyst for continuous quality improvement. Apprised by stakeholder views and experiences of A&R, we offer a model to foster stakeholder participation in quality assurance matters through affordances of meaningful engagement.

KEYWORDS

quality improvement, early childhood education and care, assessment and rating, meaningful engagement, long day care

Introduction

Regulation and the establishment of quality standards frameworks continue to be used by governments across the world as key policy levers to professionalize the early childhood workforce and to improve the quality of early childhood education and care (ECEC) (OECD, 2018; Hotz and Wiswall, 2019; Melhuish and Gardiner, 2019; UNICEF, 2019). Widely viewed as an artefact of neoliberalism (Sims and Hui, 2017), the efficacy and impact of government-led quality assurance frameworks in realizing these goals has been questioned. Common areas of concern relate to the role of regulation in setting *minimum* quality standards; the tendency to focus on structural quality elements that are more easily quantified and measured (Slot et al., 2015; Moloney, 2016); and the potential for regulation to lead to universal, isomorphic and narrow definitions of what constitutes quality practice (Bourke et al., 2018). The collective impact is often seen to be promulgation of a technical view of the work of educators, contrary to the espoused policy intent to support and strengthen professional identity and practice within the ECEC workforce (Fenech et al., 2006; Sims and Waniganayake, 2015). Acknowledging these concerns, the potential contribution that policy and regulation can play in raising quality and supporting a professional ECEC workforce has also been recognized.

The role of regulation in laying the groundwork for structural quality elements that are known to contribute to process quality and improved child outcomes has been established (Wangmann, 1995; Slot, 2018). Advocating the importance of a qualified ECEC workforce, Goffin (2015) argues the need for greater consideration of the role that state governments play in promoting and supporting a professional workforce through certification and licensure. Examining the Australian National Quality Standard [NQS] (ACECQA 2011), Siraj et al. (2019) concluded this fulfills three important functions: (i) drawing attention to factors that influence service quality, (ii) ensuring a minimum quality threshold across the ECEC sector, and (iii) potentially providing quality improvement processes and tools to support services to work toward higher quality provision.

It is also important to acknowledge change and improvement in systemic approaches to regulation and quality assurance in ECEC, and the emergence of various models and approaches globally. For example, many previous critiques have pointed to the limitations of detailed and prescriptive regulatory tools and approaches (e.g., Slot et al., 2015; Pianta et al., 2016). Australian leader in quality assurance Wangmann (1995) advocated the need for regulation and a national accreditation system to drive quality improvement, paving the way for the current integrated National Quality Framework [NQF].

Over recent years, there has been increased attention to the characteristics of effective regulation and standard setting in ECEC. The recent OECD policy review entitled *Quality beyond regulations* (2018–2022) examined ECEC policy approaches in a selection of OECD countries, including Australia, Ireland, Luxembourg and Sweden to "identify and discuss the main policy levers that can enhance process quality" (OECD, 2022, 1). *Governance, standards and funding* is identified as one of five key policy levers to improve quality in ECEC, sitting alongside curriculum and pedagogy, workforce development, data and monitoring, and family and community engagement. The review offers "policy pointers" (p. 3) to inform the design and implementation of effective regulation and quality assurance systems. Key considerations include ensuring a comprehensive and coherent framework that addresses all ECEC services; building in a strong focus on process quality; building shared understanding of quality standards; promoting self-evaluation and a culture of continuous quality improvement; optimizing the use of data to improve quality; and facilitating the voices of parents and children in quality assurance processes (OECD, 2022, 3–4).

Drawing on the broader literature on effective regulation and quality assurance processes in education, there is also general agreement that standards need to address the key determinants of quality, be informed by contemporary theory, research and practice, and be subject to regular review and updating (Tayler, 2011). Emphasis is also placed on regulatory tools and processes that enable professional autonomy and agency within the local ECEC context (Irvine and Price, 2014) and extend beyond the identification of quality inputs to describe quality in terms of children's experiences and outcomes (Jackson, 2015). Importantly, as highlighted by Bourke et al. (2018), it is also not just about the mandating of quality and/or professional standards, but how they are understood and used. For example, are standards seen as regulatory or developmental or perhaps a combination of both approaches?

The assessment and rating of practice through state-based and national quality rating and improvement systems is a common feature of regulation and quality assurance in many countries (Harrison et al., 2019). Australia's NQF offers one contemporary example, that includes a national Assessment and Rating (A&R) process. Despite the expanded use of quality rating and improvement systems in government-led quality assurance practices, there is a paucity of research on their use and impact on professionalization and quality improvement goals in ECEC. Recognizing the efficacy of top-down policy is determined at the local level (McLaughlin, 1991), this study explores the contribution of the National Quality Standard (NQS) and its associated Assessment and Rating (A&R) process to continuous quality improvement in Australian long day care services, from the standpoint of providers and professionals delivering these services. The study seeks to deepen understanding of the challenges and barriers to quality improvement in long day care, alongside strategies and supports associated with meaningful and sustained quality improvement.

Australia's national quality framework

Australia has a strong track record in quality assurance in ECEC (Ebbeck and Waniganayake, 2003), implementing the world's first national *Quality Improvement and Accreditation System* (QIAS) in 1993 and celebrating almost three decades of national standards and quality assurance in ECEC. In the 1990s, Australian researcher and architect of the QIAS June Wangmann advocated the need for a comprehensive and integrated approach to quality assurance in ECEC. Underpinned by her research into *contributing* and *determining* components of quality, Wangmann (1995) argued the value of legislated minimum national standards and a quality framework that promoted and supported services to adult-child quality. Aligning to structural quality factors, contributing components were seen to provide "the most favorable conditions in which good quality outcomes are most likely to ensue" (Wangmann, 1995, 74), and could be generally addressed in regulation. Aligning to process quality, determining components focused on adult-child relationships and

interactions, and partnerships with families, aspects more difficult to address in regulation. Drawing on this distinction, Wangmann (1995) observed the need for both regulation and accreditation, arguing that each addressed distinct but complementary functions. The QIAS introduced a four-point quality rating scale, designed to support quality improvement and to assist parents to make informed ECEC choices. While marking a significant landmark in Australian ECEC, the QIAS was limited to long day care services, built on state-based legislation and regulations.

Building on this solid foundation, and informed by contemporary policy and research perspectives, the introduction of the NQF in 2012 marked another important milestone in Australian ECEC (Irvine and Price, 2014; Jackson, 2015). Drawing on the recent OECD (2022) review as a point of reference, key changes in Australian regulation and quality assurance included: the move from separate state-based regulation and licensing to a national law and regulation; the integration of minimum regulatory standards and higher quality aspirational standards within one National Quality Standard (NQS); expanded scope to include all ECEC services, including some previously excluded services such as state-funded preschools and kindergartens; and establishment of the Australian Children's Education and Care Quality Authority (ACECQA) to oversee the NQF and drive quality improvement, working with all levels of government. Our analysis is that the NQF addresses most of the policy considerations for "building strong quality assurance systems for ECEC" (OECD, 2022, 3), supported by a public commitment to ongoing review and improvement of ECEC quality policies and practices.

Promoting the importance of early learning (Siraj et al., 2019) and the professional work of educators in ECEC (Irvine and Price, 2014), the NQF strengthened the focus on process quality (Tayler et al., 2013), with an emphasis on educational programs and practices (Jackson, 2015). This is supported by two national Approved Learning Frameworks, and introduction of the 'educational leader' role to lead the educational program at the ECEC service. Acknowledging the influence of context on quality practice, the NQS places emphasis on educators exercising professional autonomy and judgment and applies performance-based standards (Irvine and Price, 2014). In this way, the NQS goes "beyond the *process* to the *outcome* that is achieved (Jackson, 2015, 517), focusing attention on children's experiences and outcomes. Reflective of performance standards approaches, the NQS promotes quality practice, informed by theory and research, but stops short of prescribing what this looks like (ACECQA, 2022a).

The NQS A&R process is promoted as a key contributor to realizing continuous improvement. All ECEC services in receipt of public funds, including parent fee subsidies, are required to participate in the NQS A&R process. Drawing together regulatory compliance and quality assurance, ECEC services are assessed against the seven quality areas of the NQS: QA1 Educational programs and practices; QA2 Health and safety, QA3 Physical environment, QA4 Staffing arrangements, QA5 Relationships with children, QA6 Collaborative partnerships with families and communities, and QA7 Governance and leadership. Promoting self-evaluation and a culture of continuous quality improvement (OECD, 2022), there are two interrelated tools designed to support critical reflection and evaluation of practice: (i) the Quality Improvement Plan (QIP) which is developed by the ECEC service and (ii) the A&R Report which is developed by the Regulatory Authority.

Under the NQF, all ECEC services are required to develop and maintain a QIP. While the format may vary, all QIPs are expected to include an evaluation of service policies and practices against the NQS and National Regulations, identify current strengths as well as quality priorities, strategies and progress toward improvement. The QIP must be readily available at the service to parents, regularly updated, and is used by the Regulatory Authority in assessing the quality of the service. The QIP is reviewed by a trained assessor, who undertakes a site visit (generally 1–2 days depending on the size of the service) and gathers evidence of quality through observation of practice, discussion with providers and educators and review of documentation. Assessors use an agreed digital tool (NQS Assessment and Rating Instrument 2020), collect evidence and rate each quality area leading to an overall service rating, and prepare an Assessment and Rating Report for the service, which includes the service rating. Like the QIP, there is consistency in the areas addressed within the Assessment and Rating Report, however, some jurisdictional differences in approach are evident (Harrison et al., 2019), including the report format, level of detail and descriptions of practice, and inclusion of suggestions to support quality improvement.

Ten years into implementation, the effectiveness of the NQF is demonstrated by steady improvements in quality as measured against the National Quality Standard (NQS). See Figure 1 for the proportion of services rated Meeting NQF by overall rating and quality area.

However, little is really known about the role and contribution of the NQS A&R process to the overarching goal of continuous quality improvement, within individual services and at the broader systems level. Drawing on findings from a national Quality Improvement Research Project (Harrison et al., 2019) investigating quality improvement in Australian long day care services, this paper addresses this gap. This research team investigated how the A&R process is experienced by those involved in service provision, with a focus on factors that enabled and challenged meaningful engagement, sustained quality improvement and an improved quality rating.

Research design

The design of this research has been influenced by a socio-cultural epistemology where knowledge and understandings are constructed and negotiated in the everyday contexts of the participants (Creswell and Creswell, 2018). Vygotsky (1978) claimed that our understandings are shaped by our own comprehension of our social, cultural and historical backgrounds and realities are conceptualized as complex and socially constructed. Therefore, the researchers used methods to generate meaning about individual participants' experiences within context, recognizing that individuals may have different experiences of the same phenomena, in this case, the A&R process.

The overarching study comprised three sequential phases and applied a mixed-methods approach (Creswell, 2015) to investigate quality improvement in long day care services. The aim was to identify the characteristics, processes, challenges and enablers of quality improvement in long day care services that had achieved a higher quality rating over two successive assessments. ACECQA who commissioned this project chose two of the seven quality areas in the NQS to study: QA1 Educational program and practice and QA7 Governance and leadership. These two areas were selected based on longitudinal data suggesting high correlation with quality improvement (ACECQA, 2022b).
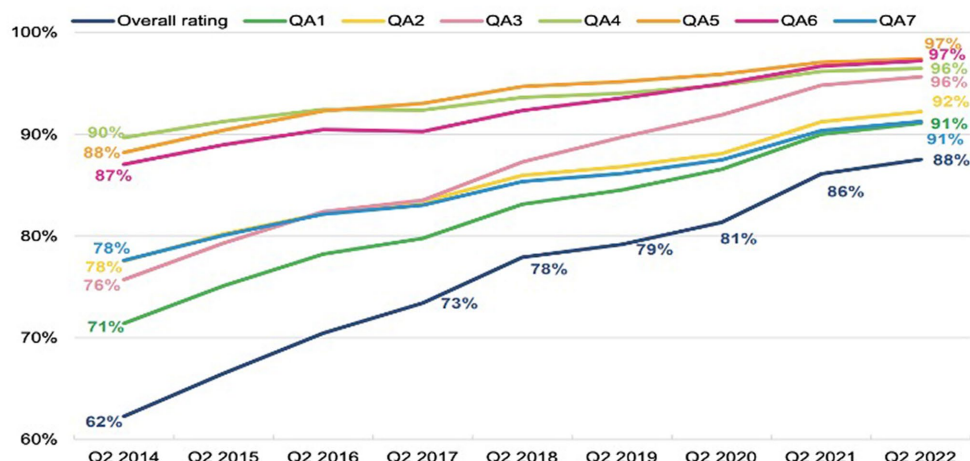
FIGURE 1
Proportion of services rated Meeting NQF or above by overall rating and quality area.

Briefly, the three phases comprised: (i) Statistical analysis of the characteristics of 1,936 long day care services that had achieved improvement from Working towards NQS to Meeting or Exceeding NQS, drawn from the National Quality IT system dataset (Harrison et al., 2023); (ii) qualitative analysis of deidentified QIPs and Assessment and Rating Reports from 60 long day care services from the Phase 1 pool, representative of the diversity of the sector (Davis et al., 2023; Hatzigianni et al., 2023); and (iii) multiple case studies (Stake, 2006) focusing on quality improvement in 15 long day care services (see Harrison et al., 2019, 2023 for a detailed description of the study design). In this paper, we report on findings emerging from Phase 3 of the study which investigated the following two research questions: (i) What are the challenges and barriers associated with quality improvement? and (ii) What are the strategies and additional supports that promoted quality improvement in long day care services?

Drawing on the Phase 1 dataset and findings, a process of purposeful selection was used to recruit 15 long day care services, reflective of the diversity of services across Australia (e.g., jurisdiction, type of provider, size of provider, community disadvantage), excluding services that participated in Phase 2 of the study. Table 1 provides an overview of demographic details for the case study sites and participants. The study was undertaken by a team of 10 researchers, from four universities located in different Australian states and territories. Leveraging the location and contextual knowledge of team members, one member of the research team was linked to each case study site. The researcher spent 2 days on site in each service and engaged in observations and professional conversations (Irvine and Price, 2014) with a cross section of stakeholders (i.e., approved provider, service leader, educational leader, early childhood teacher and educators). These were individual conversations, undertaken in a quiet private space within the long day care centre. Researchers sought to investigate stakeholder views and experiences of the A&R process and enablers and challenges associated with quality improvement. Examples of questions included:

- *Looking at QA1 Educational programs and practices, what did you focus on and why?*
- *Who was involved? Why?*

- *What areas of your work did you feel most confident about? Why?*
- *What areas, if any, were you concerned about? Why?*
- *What do you think had the greatest positive impact? Why?*

Hand-written field notes and an agreed case study template assisted in the development of a detailed case study report for each of the 15 services. This was returned to the ECEC service for review, edit and verification. The 15 de-identified case study reports were then shared with the whole research team. Individual researchers independently engaged in a process of thematic analysis to derive first impressions of challenges and barriers, strategies and support to quality improvement within and then across the case studies. Equipped with their individual analyses, the whole research team met in person for a full-day collaborative thematic meta-analysis discussion, facilitated by an expert early childhood researcher as a critical friend.

In this paper, we focus on the analysis of the case studies to explore the contribution of the NQS A&R process, including the Quality Improvement Plan and Assessment and Rating report, in driving and supporting continuous quality improvement within individual services and at the broader system level.

Findings

Our primary interest was the service approach to, and lived experience of, assessment and rating. Concentrating on QA1 Educational program and practices and QA7 Governance and leadership, we look at the challenges and barriers providers and professionals associated with quality improvement, and the strategies and additional supports they perceived had led to sustained quality improvement, evidenced by an improved quality rating.

Findings are discussed under three broad themes: (i) curriculum knowledge, pedagogical skills and agency; (ii) collaborative leadership and teamwork; and (iii) meaningful engagement in the Assessment and Rating process. There was some variation across the case study sites as to whether these themes presented as challenges or enablers, and evidence of a challenge being resolved to become an enabler across the two points of assessment. As such, under each theme,

TABLE 1 Demographic information of who assisted in the study from each site.

Centre	Type	Location	Main participants in study and qualifications	Places
1	Stand alone NFP	Metropolitan	D Dip CS; EL Dip CS; 5x ED Cert 3	33
2	Stand alone FP	Metropolitan	O BSc; EL ME;ED Dip Prim Cert3; ED x3 Dip CS; Inclusion Support Cert 3;Cook Cert 3;ED Cert 3	46
3	Stand alone FP	Semi-rural	D Dip CS; EL Dip CS; ECT; ED x 5 Cert 3; ED x 3 Dip CS; Cook Dip CS	57
4	Stand alone FP	Metropolitan	Cd Dip CS; Ed Dip CS; ED x 3 Cert 3; ECT	54
5	Stand alone NFP		M Dip CS; EL ECT; ED x3 Dip CS	55
6	Large provider FP	Metropolitan	D Dip CS; EL Dip CS; ED x 2 Dip CS	75
7	Large provider FP	Metropolitan	AP rep; SM; EL; ECT; Ed x3 Dip CS	75
8	Large provider NFP	Regional City	D/EL AD; ECT x 3; ED x6 Dip CS; ED x3 Cert 3	55
9	Stand alone FP	Metropolitan	D; AD Dip CS; ECT x 2	37
10	Stand alone NFP	Metropolitan	D; Team leaders x 6 (2 ECTs, 4 Dip CS), cook, 5 part-time EDs	94
11	Large provider NFP	Metropolitan	D Dip CS; A/D Dip CS; EL Dip CS; ECT; ED x 5 Dip CS; ED Cert 3; IS Cert 3.	82
12	Stand alone FP	Regional	O, D, ECT, EL BA Prim, Dip CS; A/D Dip Cs; A/D Dip CS; ED x 3 Cert 3	45
13	Small provide FP	Metropolitan	D, EL Dip CS; ED Dip Cs; ED x2 Cert 3	30
14	Stand alone NFP	Metropolitan	D Dip CS; EL Dip CS; ED x 2 Dip CS; ED Cert 3	120
15	School based NFP	Metropolitan	AD EL Dip CS; ECT; ED Dip CS; ED x 2 Cert 3	45

Participants: O, owner; D, director; EL, educational leader; ED, educator; IS, inclusion support; C, cook; M, manager; AP rep, approved provider representative; SM, service manager; AD, assistant director; Qualifications: Dip CS, diploma of children's services; Cert 3, certificate 3; Dip Prim, diploma of primary; ME, masters of early childhood; AD, advanced diploma; BA Prim = bachelor of arts –primary. Type: FP, for profit; NFP, not for profit.

we discuss challenges and barriers alongside strategies and supports for sustained quality improvement.

Curriculum knowledge, pedagogical skills and agency

Across the case studies, QA1 was commonly described as the 'most important' and 'most challenging' area within the NQS. It was also widely considered to be the starting point to drive quality improvement. Recognizing the holistic and integrated nature of the NQS, some participants advocated the benefits of focusing on QA1 in terms of the impact on other quality areas, in particular, QA5 Relationships with children and QA6 Collaborative partnerships with families and communities.

> "It's all about QA1" and "QA1 demands time", "it's about building knowledge and confidence" (EL, CS7).

There was a strong shared focus on promoting children's learning, development and wellbeing, and the starting point for most was building deep knowledge and understanding of the national Approved Learning Framework.

> "The planning focussed on the EYLF and knowledge of the NQS [including EYLF] was given as the most important change from the first to second rating" (EL, CS15).

Notably, one service leader reflected that the assessor had encouraged the service to focus on QA1 in preparation for A&R and felt this had been good advice. She reflected that the team focussed on QA1 for 12 months, "learnt it together" and that "having only one area

to focus on made it easier in a way for the staff" (CD, CS14). She attributed the service's award of *Exceeding NQS* to having time to explore, to engage in team conversations and to think more deeply about their practices, with impact on all areas of their professional work.

Closely aligned to building curriculum knowledge, was strengthening pedagogical skills, in particular the planning cycle - observing, assessing, planning, implementing and evaluating children's learning (Australian Government Department of Education, 2022). Educators' understanding and implementation of the full planning cycle was identified as a shared challenge and ongoing priority for professional learning and improvement. In particular, the sometimes adhoc nature of planning, absence of clear connections between observations, planning and assessment of learning, was identified as a barrier to effective learning and teaching. The case studies revealed a range of strategies to build capability, including the introduction of shared templates, mentoring and coaching by the educational leader, peer mentoring and collaborative teamwork.

> [A] "key focus has been program training, concentrating on the planning cycle – observe, analyse, plan, evaluate and follow-up. This was supported with the introduction of a template and the expectation that educators would complete "one planning cycle per month per child" (EL, CS7).

> [The service focus was] "to close the loop of the planning cycle to describe 'what's next'. The Assistant Director described having to go back to the 'basics'. She said that programming had seemed 'pretty random' and she introduced the idea of focus children 'to make sure no children were missed'" (CD, CS15).

Integral to this goal was building team capability, supporting *all* staff to contribute to the planning cycle as well as strengthening child voice in planning.

> "Being consistent with their planning across all rooms and with all ages of children is the main challenge…. some educators need extra support. They need to go beyond 'aesthetics' … They have to realise the links with children's learning and also try to involve younger children in their planning more" (CD, CS5).

> "The voice of children was an area that the Assistant Director said needed to be shown in the planning for the centre. She described the 'idea of having a program meeting with children… and ask what they want next week'" (AD, CS15).

Involving families in planning and assessment of learning was a focus in some centres. While identified as a shared challenge, some teams appeared resigned to limited engagement, while others continued to explore and experiment with ways to facilitate family input in planning and assessment of learning.

> "While consultation with families has met with limited success, the use of technology is being explored as a more contemporary way of informing and connecting with them" (CD/EL, CS10).

Across the case studies, capacity to engage in critical reflection was identified as a barrier to improving practice, and there was a strong focus on teaching critical reflection as part of the planning and assessment cycle. In this context, emphasis was placed on using professional conversations to support educators to think more deeply about their practice, i.e., what they do and why. Interestingly, an explicit goal here was to build educator confidence and ability to articulate their professional practice to a variety of audiences (e.g., colleagues, families and Authorized Officers during Assessment and Rating).

> "The [NQS] assessment picked up planning cycles, so we have been focusing on this and have travelled a distance. So too, training at all levels is focusing on building critical reflection skills to help all educators to 'look deeper' and to be able to explain what they do and their reasons for working in that way…'It's show me and tell me what you are doing and why'. The intent is to help educators to feel comfortable responding to questions and talking about their practice" (AM, CS7).

> "The centre continues to use the critical reflection questions in each room and the critical reflection book to support educators to consider why they operate in certain ways and to explore changes to practice, both in their room and across the centre"(CD/EL, CS10).

Documenting teaching and learning was identified as a continuing source of concern for service leaders and educators, and a shared challenge across the case study services. Several service leaders reported that 'staff lacked confidence in programming' and were frequently asking 'are we writing enough'? Again, there was mention of templates, however, most centres enabled educators to

exercise agency in how they used templates and/or documented learning and teaching. The case studies highlighted the important role of approved providers and service leaders in managing expectations and providing the necessary time and support for curriculum documentation.

> "'I don't want them to write pages, it needs to be meaningful. I don't want them to be at home all weekend doing paperwork'. Each room has its own style of programming and it is the 'quality of thinking that is important' – [it] doesn't have to be pretty'" (CD/EL, CS8).

> "Documentation was a major concern for ensuring improvement… As a strategy, the Director had allocated staff much more time to document children's learning. All educators were given 2 hours per week and the Educational Leader had a full day with the Director replacing her. The Educational Leader explained this was 'critical in having time to plan and reflect'" (EL, CS1).

Collaborative leadership and teamwork

Most participants perceived that effective leadership was a key enabler of quality improvement. So, perhaps it is not surprising that building leadership capability was a focus for many of the case study sites. This was particularly evident in services operated by larger ECEC organisations. The focus here tended to be on positional leadership roles, for example, the centre director and educational leader.

> "The current management acknowledges the importance of leadership and has had a strong focus on building leadership capacity across the organisation" (CD, CS7).

> "Leadership is the key. When you don't have good leadership you can really see it… I look up to them and take note of what they do and follow in their footsteps" (ED, CS15)

Within this context, emphasis was placed on the role of the educational leader in driving quality improvement (see Douglass, 2019). There were significant differences in how this role was conceptualized, understood, and supported within centres, with some evidence to suggest greater appreciation and investment by approved providers in the role over time.

> "In the first A&R, the centre 'didn't really have a dedicated educational leader'. [An educator] 'was thrown into the role at the last minute by the previous management, but had no time allocated for the role'… [Now] 'There is a spotlight on educational leadership within the centre'… Seeking to support the educational leader 'to be a good mentor', the approved provider provides training for educational leaders and the area manager hosts a weekly educational leader network meeting via Zoom. In the case study centre…the educational leader is rostered one regular day per week for the role and perceives her role to be 'about bringing the team together'" (EL, CS7).

Ensuring the 'right person' was appointed to this role was a shared challenge. While there were differences in views about qualifications, this was seen to be about pedagogical leadership, requiring strong pedagogical knowledge supported by effective leadership skills. Some teams reflected on past experience and observed the positive impact of a new educational leader within the centre.

> "'The appointment of a new educational leader brings fresh perspectives to practice'… 'It's a learning journey for everyone'… 'He supports staff to ensure curriculum knowledge is updated and evident in documentation'… 'He acts as a role model, working alongside educators, demonstrating the use of the agreed planning cycle and the appropriate language in order to embed these in everyone's practice…' The educational leader visits the rooms each week and regularly unpacks learning stories and documentation. Changes to programs are overseen by the centre director and educational leader together" (CD, CS10).

The case studies placed emphasis on building shared understanding of the role of educational leader, and team expectations for quality improvement. Key strategies included a clear role description, orientation and induction processes for all staff, and investment in ongoing professional learning and support for the educational leader and team. Some centres also highlighted the need for a unified centre leadership team, characterised by positive and supportive relationships between the approved provider, centre director and educational leader.

Acknowledging the contribution of dedicated and skilled leaders, the case studies pointed to collaborative leadership and teamwork as a critical enabler. Reflecting on different experiences of leadership, participants highlighted the positive impact of leadership that unified the team, facilitated conversations, enabled educator voice and different ways of working – with evidence-informed rationale.

> "Given the multicultural diversity of the staff team at this centre, and with 'lots of staff changes', many staff remarked about the importance of having time to talk together. Staff spoke about 'working together and coming up with ideas together', and 'team bonding' through 'team building activities'… Centre staff felt that 'together' they were a 'strong team', 'supportive' of each other and that using 'people's strengths' can make the difference" (EL/ECT/, CS2).

> "Educators described the centre director who also fulfilled the role of educational leader as knowledgeable and skilled. 'She leads the team, challenges staff, does the leg work, makes work fun'… She plays an active role in stimulating and facilitating professional conversations between educators. 'There is lots of discussion'. Educators spoke of a leader who 'works with individuals recognizing their strengths, limitations and family contexts' and 'was always there for staff'… 'She doesn't come across as the boss, she works with the team. She makes staff feel comfortable and they feel they can contribute'" (ED, CS8).

The approved provider was seen to have a key role to play in establishing and maintaining conditions that supported a positive work culture and environment. Educators spoke about the importance of trust and respect, alongside the provision of time and resources (human and physical) to undertake their professional work and drive quality improvement. The impact of this was a sense of belonging to the centre, resourced learning environments and stable teams who trusted each other and worked well together.

> "A positive organisational culture was also a common supporting element for participants… Most of them have been working for the centre for more than 15 years and trust each other. Specific elements of their everyday practice, such as hours of planning, [above ratio] staffing arrangements, strong relationships with parents and self-assessments were also seen as supportive factors for doing well" (ED/EL, CS5).

> "There was also strong agreement from both new and old staff… that the owners were 'friendly and treated everyone with respect' and were 'supportive of staff and families'… Many educators noted the owner's acknowledgment of staff and how they 'felt appreciated' and this had contributed directly to their 'sense of belonging at the centre'" (ED, CS2).

Leadership, support and investment in continued professional learning was seen to be a key contributor to a positive and supportive work environment. The case studies promoted the benefits of strategic and intentional approaches to staff development, that included engagement in external activities (conferences, workshops and networks) as well as optimizing team learning through mentoring, coaching and conversations within the centre.

> "The centre director's inclination to provide opportunities for educators to attend professional learning to improve their practice was seen as very supportive. Staff meeting agendas always include items about the QAs [NQS Quality Areas] for discussion… and also involve critical conversations about how research and theory underpin staff practice. At different times, each educator is asked to reflect on research that impacts their practice and share with the meeting, thus supporting them to make and maintain connections between theory and practice. Casual staff are encouraged to attend and attendance is paid for 4 times per year" (CD, CS10).

> "Performance review is not just about performance, it's about learning and development" (CD, CS8).

We note that leadership wasn't a focus for all participants. There were a small number of participants, mostly educators, who reinforced their focus on QA1 and other 'practice areas', asserting leadership wasn't their role and 'they did not have time to think about leadership'.

Meaningful engagement in the Assessment and Rating process

The case studies provided illustrations of what we conceptualize as *meaningful engagement* with the Assessment and Rating process, with evidence of positive impact on team relationships, collaboration

and improved practice. Participants highlighted factors that enabled or constrained their engagement in the Assessment and Rating process, which extended beyond the centre to include relationships and interactions with the Regulatory Authority.

Reinforcing previously identified themes and factors, participants described collaborative approaches to the development of the QIP as an enabler supporting team engagement in planning, implementation and evaluation of quality improvement strategies. In several centres, participants contrasted this with prior experiences where a positional leader was solely responsible for the QIP.

> "All staff were involved in the development of the QIP which took place over a year. This was very different to the first time as the previous Director did not include staff in its development" (CD/EL, CS1).

> "The staff prepared for the Assessment and Rating by working as a team to develop the QIP. The Centre Director/Educational Leader met with all team leaders and used their input". (CD/EL, CS3).

Facilitating educator voice in the QIP was identified as a key enabler to sustained quality improvement, building a sense of shared leadership, responsibility and accountability to drive agreed practice change.

> "The current leadership team was keen to ensure that everyone's voice was being heard in developing the QIP. The owners have trust in staff expertise in delivering good early childhood programs and provided necessary support… In developing the current QIP all staff have one Quality Area as their focus and these were self-identified…An experienced staff member was paired with someone less experienced…At monthly meetings, these staff teams reported on progress to date… Educators spoke of moving away from 'being told what do to' with the previous QIP to 'now being asked for their ideas'" (ED, CS2).

> "The development of the QIP led by the director involves all staff. As this document is updated, the director sends sections to each room for comment and suggestions. They attempt to have families comment too. Everyone is encouraged to add comments/questions about processes in the centre" (CD/EL/ECT, CS10).

Importantly, there was a strong focus on using the QIP as a strategic planning tool, to establish shared goals, improvement strategies and track progress toward goals.

> "Leaders and some educators reflected that the QIP provides a framework to track 'the centre's journey'. 'It helps you to look at where you have come from and where you can improve'" (ED, CS7).

> "The director specifically emphasised the QIP, seeing it as a dynamic report that needs regular feedback" (CD, CS6).

The case studies revealed some differences in how the services conceptualized and prepared for A&R, including within the same centre over time prompted by new leaders and past experience. Differentiating between first and second assessments, several leaders placed emphasis on showcasing quality and improvement in everyday practice.

> "The CD/EL said she wanted 'the [A&R] process to be a positive experience'. She worked with the team and her co-director to be prepared. She guided staff saying, 'if you don't think the assessor is seeing your strengths point it out' and 'do your normal day – you'll be fine'… Staff of all qualifications cited 'teamwork' and 'conversations during staff meetings' as important processes in the lead up to A&R … In essence, the philosophy of the centre is that they do not complete the QIP for A&R but rather 'we do this for the betterment of the centre'" (CD, CS3).

> "While there was some discussion about getting things ready for A&R, there was also a general sense of 'business as usual'. An early childhood teacher noted that she felt 'what they were doing was right and she tried not to worry about A&R'. Another educator commented 'there is not a lot of preparation – what you see is what you get'" (ECT/ED, CS8).

While there appeared to be less emphasis on preparation, there was a strong shared focus on supporting educators to engage with the A&R process, in particular, to feel comfortable, confident and able to articulate their professional practice.

> "To do well you need to be confident in what you are doing and you need to be able to explain what you are doing and why you are doing it. It's about showing where you have been and where you are going. It's not about being perfect. It's about the journey" (AD, CS7).

Here participants identified the centre's relationship with the Regulatory Authority and the assessor's approach on the day as enabling or constraining meaningful engagement. Several participants contrasted their two experiences of A&R, highlighting more collaborative and supportive approaches the second time.

> "To prepare for the first A&R process, the centre director and assistant director attended a local information session hosted by the Regulatory Authority… The new A&R process was presented as collegial and supportive, with greater emphasis on observing and discussing practice and less emphasis on documentation. However, this was 'not the lived experience of this centre'. All educators… described it as a negative experience, attributed to the lack of clarity about what was required, and the compliance approach taken by the assessor. The assessor sat in the corner with her IPAD and did not engage staff or children in conversation. The centre director described it as a 'lazy visit'… The second A&R visit was a more positive experience, described by one educator as 'more relaxed and engaging'…largely attributed to the approach taken by the assessor… Educators noted there were more conversations seeking to understand practice and some positive feedback. Several noted they felt 'more comfortable' 'more confident in ourselves' and 'able to simply do what we normally do'" (CD/AD/ED, CS8).

> "All participants compared the [two] visits and identified important differences. The [first] assessor was not as friendly and made them feel nervous. There were concerns around her professionalism and the usefulness of her queries and feedback. They all agreed the [second] assessment was a much more constructive and positive experience leading to confidence and working harder to achieve better results in the future" (CD/AD/EL/ECT/ED, CS5).

Across the case studies, participants identified the benefits of their engagement in the A&R process, with a particular focus on the contribution of the QIP and A&R report to quality improvement. Service leaders focused on using A&R to 'unify the team' and get everyone to look 'at the bigger picture' (CD, CS1). Leaders and educators reported 'feeling closer together' and being a 'stronger team' for having gone through the process (CS3). One educator reflected 'the process of A&R unified us, and we found opportunities to see each other's strengths' (ED, CS4). Many participants commented on the A&R process and report as 'useful in promoting and supporting continuous quality improvement' and as a 'prompt to consider where to next' (ED, CS8).

> "The previous A&R report was used as a basis for quality improvement… 'The assessment picked up the planning cycles, so we have been focusing on this and have travelled a distance' (EL)…'It's good for the next time we go through it. You see it's not a lot to get to the next level. It makes you look forward to the next one because you know you can get there'" (AD, CS7).

> "The report was really useful in reflecting on current practice and to stimulate conversations about ways to improve" (CD, CS11).

> "The Assistant Director described the QIP and the A&R feedback 'as a compass for myself, I have used all the feedback'" (AD, CS15).

Ultimately though, the case studies pointed to the need to build a centre learning community where all members are supported to meaningfully engage in the Assessment and Rating process, and are open and able to critically reflect upon and evaluate feedback gathered to inform continuous quality improvement.

> "The management team drove the changes that were needed in QA1 with sound communication channels to both the staff and families. The Board was also very involved and supportive… The focus on agency and children's choices required every room to rethink how they involved children in the program and routines. For many it was confronting but the educational leader and room leaders were committed to making the changes and the process was a collaborative team effort" (CD, CS14).

Discussion

The Australian NQF builds on a lengthy history and commitment to systemic approaches to regulation and quality improvement in ECEC. Using the OECD *Quality Beyond Regulations* (2022) review as a current point of reference we have suggested the NQF provides an example of contemporary regulation and quality assurance in ECEC. From a systems perspective, the explicit aim of the NQF is to "raise quality and drive continuous improvement and consistency in children's education and care services" (ACECQA, 2023, 8) across Australia. Aligning to the OECD recommendations, the NQF covers all education and care services, targets key determinants of quality based on current evidence (Siraj et al., 2019; Thorpe et al., 2022), strengthens the focus on process quality, promotes self reflection and evaluation, and enables the standards to be met in different ways promoting educator agency and professional practice (Irvine and Price, 2014; Jackson, 2015).

Our research interest was the translation of policy into practice. Using multiple case study methodology (Stake, 2006), we explored the lived experience of Assessment and Rating, focusing on the factors that enabled and challenged meaningful engagement, sustained quality improvement and an improved quality rating. The concept of meaningful engagement is important here. Based on the study findings, meaningful engagement in A&R is characterised by leadership that: facilitates the authentic involvement of all team members; enables individual and collective voice and agency in decision-making, supports an inclusive learning community, and promotes shared leadership, responsibility and accountability for quality improvement. Importantly, while recognizing the critical leadership role of the approved provider and positional leaders within the service, meaningful engagement is reliant on collaborative leadership and teamwork, inclusive of children, families and the Regulatory Authority (Douglass, 2019).

The study findings show that meaningful engagement in the A&R process informed priorities for ongoing learning and acted as a catalyst for continuous quality improvement, consistent with stated policy expectations (Siraj et al., 2019). The dominant focus was process quality, in particular, building individual and collective capacity to enhance teaching and learning. Interestingly, there was also evidence that engagement with A&R provided a platform for team building and effective teamwork. Recognizing the association between educator stress and engagement in Quality Rating and Improvement Systems, this was an unexpected finding. Reflective of previous studies (Grant et al., 2018), educators in our study talked about the stress of external observation and assessment, and expressed some anxiety about preparation and documentation. However, our analysis revealed a range of strategies employed by services to build educator knowledge and confidence, reducing stress and anxiety and strengthening engagement over time.

We embarked on analysing the findings of this study to better understand how to get the most out of the NQS Assessment and Ratings process at the grassroots level, in order to achieve sustained quality improvement in ECEC settings in Australia. While acknowledging different ways of working, the study highlights three critical enablers of meaningful engagement demonstrated by providers and practitioners and associated with genuine and sustained quality improvement and an improved quality rating. These are:

   i Leadership understandings and approaches
  ii Knowledge, skills and agency
 iii Learning communities

FIGURE 2
A model to support meaningful engagement in quality improvement.
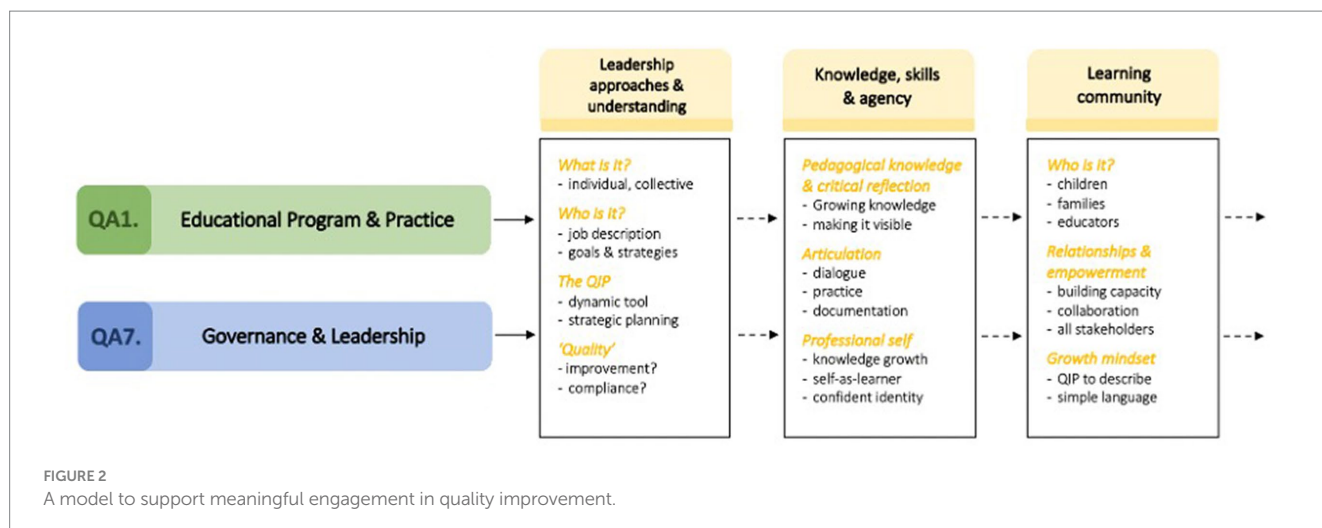
Combining these three elements, we offer a model to foster stakeholder participation in quality assurance matters within ECEC services through affordances of meaningful engagement (see Figure 2). Our model serves as a representation of the aspects in QA 1 and 7 that assisted services to improve their rating and successfully engage staff in the A&R processes. Each of the enablers are discussed in turn, with reference to extant literature as appropriate. Recognizing the critical role of leadership in driving and enabling quality improvement (Waniganayake et al., 2023), we begin with leadership understandings and approaches.

Leadership understandings and approaches

In this study, the way that leadership was understood and enacted at different levels across the roles of the approved provider, centre director, educational leader and educators built a context that empowered all individuals to lead in some way and was critical to driving quality improvement. With the exception of a few, the majority of educators, believed they had a role to play in leading quality practices and that leading was both a collective and an individual activity. The approved providers in these services held the view that to improve quality, positional leadership roles were important and needed to be well defined and receive investment of both time and resources. Sebastian et al. (2016) found that organizational leaders played a key role in flattening power structures to a more distributive leadership approach and fostering leadership in others. Kangas et al. (2015) and Eskelinen and Hujala (2015) in Finland describe how administrators can influence the development of leadership in a service, as they set the organizational conditions that enable or constrain leadership across the staff team. In this study, leaders knew their roles and responsibilities and were able to filter top-down policies such as the implementation of the NQS in ways that made them non-threatening to others as shown in taking a team learning approach to the A&R visit. Campbell-Barr and Leeson (2016) suggests that an active egalitarian style of leadership promotes a positive workplace environment that enables the successful contextualization and implementation of top-down policies.

Leaders were strategic in thinking through and co-developing goals and strategies for improving practice using the NQS. The QIP became a living, dynamic document with input from all stakeholders: approved providers, children, families, centre staff and other

professionals, including the Regulatory Authority through the A&R report. Leaders in these services built an understanding that optimizing outcomes through quality improvement for children was a shared responsibility and everyone was accountable to each other for the realization of this. Sims et al. (2018) found that many educational leaders concentrated on compliance, yet in contrast in this study, leaders worked hard to instil an understanding of the NQS and Assessment and Rating process as a tool of continuous quality improvement, not as compliance.

An aspect of this leadership approach was a strong shared focus on building all educator's deep knowledge and understanding of the national Approved Learning Framework as the foundation for curriculum and pedagogy. This is discussed next.

Knowledge, skills and agency

For meaningful engagement to occur, a strong shared focus on building deep knowledge and understanding of the national Approved Learning Framework as the foundation for curriculum and pedagogy was key. It was shown that educational leaders required a strong foundational knowledge of early childhood curriculum and pedagogy as outlined in the Early Years Learning Framework (DEEWR, 2009). They were also required to be articulate and knowledgeable about learning processes so they could lead the learning of others. This was also found by Moyles et al. (2002) in the Study of Pedagogical Effectiveness in Early Learning (SPEEL) where effective early childhood leaders were those who were able to combine specialist knowledge and professional capabilities with centre philosophy and reflective dispositions. Additionally, the educational leaders saw themselves as leaders of teaching and learning across staff teams and who sought new ideas and ways of working by engaging with theory and research. Effective pedagogical leadership assists in "forming a bridge between research and practice through dissemination of knowledge and shaping agendas (Siraj and Hallet, 2014, 112).

The educational leaders in this study were able to articulate professional practice in ways that others with varied backgrounds and qualifications could understand. This is not an easy task. As Sims et al. (2018) observe, educational leaders need to interpret legislation, policy and curriculum documents before they can model and support

educators in their centre. Educators spoke of a different understanding of their professional self, as well as themselves as learners who grew when pedagogical knowledge was shared through dialog, and reflective practices became embedded in their daily work (see Douglass, 2019). Critical reflective practice was important for not only changing practices but also assisted with educator's confidence and ability to articulate and make visible in their planning and documenting of the what, why and how of their work in relation to the NQS. A key aspect of an educational leader's work was monitoring pedagogical and planning documentation, but this was embedded in a discourse of relationships which was also found by Sims et al. (2018). Educational leaders knew that to be successful ownership was necessary and some sense of power in changing processes or leading practices for change. Staff agency and trust brought about engagement in learning and professional development, and strategies to support change and sustain improved practice (Douglass, 2019).

Finally, the case studies promote the need for, and shared benefits of, cultivating a learning community within the centre, inclusive of all members of the community (e.g., educators, children, families, all staff and the approved provider).

Learning communities

In the settings in this study that improved ratings, leaders and educators had built a learning community that involved educators, children, families, community members and other professionals. It was seen there was a role for the approved provider and centre director in creating and maintaining a work culture that enabled a learning community where relational trust was built and time and resources were given. Inviting and facilitating child and family input into quality improvement aligns with the objectives of the NQF and has been identified as key to strengthening process quality and improved ECEC internationally (Edwards, 2021). Leaders in this study were shown to build learning communities by empowering others, boosting morale and enthusiasm and supporting effective structures to evaluate practice for improvement. By thinking of the setting as a learning community, educators in this study were invited to contribute to the development of the QIP and A&R report which served to bring the team together. The structures put in place by leaders and staff teams are important aspects in terms of building confidence about quality improvement practices, professional learning and collaboration fostered with specific goals for improvement (Douglass, 2019). Eadie et al. (2021, 69) found that quality improvement occurred when there was a 'whole-of-service' approach to quality improvement that assisted in strengthening educator knowledge and skills.

Attention to relational elements in building learning communities that empowered educators was important in this study and also found in other studies (see Sims et al., 2018). Indeed, the Guide to the National Quality Framework (ACECQA, 2023, 308) in Quality Area 7.2 the text describes effective leadership that "builds and promotes a positive organizational culture and professional learning community". Many services in the case studies exercised leadership that reflected this definition as they took a community learning approach to the A&R process that built collegiality and capacity of all stakeholders. To improve quality Douglass (2019) reports that collegial relationships and providing a range of supports for staff such as professional

development and mentoring programs are a strategy that may be used to increase the capacity of staff. The A&R process was not seen by educators as a big stick or one-off performance but rather an ongoing learning opportunity supported by mentoring, coaching, professional learning and the building of reflective practices. Through mentoring and coaching, feedback was regularly given to educators that was timely, relevant and explained how educators could improve in line with effective feedback practices (Keiler et al., 2020). Leaders in services built the growth mindsets (Dweck, 2016) of educators who were open to setting goals in learning and where the trying out new practices, making mistakes and adjusting were all seen as part of the learning process. The QIP was an open and shared strategic planning document. It was simply written, and educators used it and understood their part in it and were encouraged to give feedback for improvement.

While we have focussed on the centre community here, we draw attention to the role of the Regulatory Authority in enabling the meaningful engagement of all stakeholders in quality improvement. The study findings highlight the influence of the leadership approach of the assessor in building shared understanding of the NQS and A&R process, asking the right questions and helping educators to feel comfortable and able to articulate their practice. The assessor's knowledge and skill in undertaking the assessment (Moloney, 2016) and developing the A&R report is also critical here, recognizing the contribution of an informed and well-written report to centre learning communities.

Conclusion

This study showed that meaningful engagement in the A&R process of the NQS provides a platform for genuine and sustained quality improvement. Meaningful engagement requires leadership at all levels and approaches that build an understanding that leadership is both an individual and collective activity. It also involves leaders with strong pedagogical knowledge as well as knowledge of how to lead others' learning. Critical reflection and articulation of practice assist educators to grow as educators and learners as well as developing a confident professional identity. The building of a learning community was key to sustained quality improvement where all stakeholders were involved, and relationships were fostered in empowering ways. Further, learning communities were developed where educators were open to change, feedback and as a result growth mindsets were developed.

Meaningful engagement is dependent on the efficacy of the broader regulation and quality assurance system, specifically, quality standards and expectations that reflect current research and practice wisdom, strengthen the focus on process quality, enable educator agency and engage all stakeholders in the quest for continuous quality improvement. This includes commitment and investment from the Regulatory Authority to drive continuous quality improvement in the system, working in genuine collaboration with those involved in providing and using these services.

Situated within a national Quality Improvement Research Project, we acknowledge limitations to the study findings. The study scope was limited to quality improvement in 15 long day care services, undertaken at a point in time, and situated within the Australian ECEC policy context. While we hypothesize similar enablers and challenges to quality improvement in other

Australian ECEC settings, based on NQS snapshot data (ACECQA, 2022a), our findings cannot be generalized to other settings or countries. We also recognize that quality improvement is both contextual and temporal; what works in one service may not work in another and within one service different approaches and strategies may be needed at different times. Acknowledging these limitations, the study findings provide unique insights into the contribution of a contemporary Quality Rating and Improvement System to sustained quality improvement, informed by the lived experience of providers and professionals engaging with the system. Our model offers research- based guidance to support the meaningful engagement of all stakeholders in quality assurance matters, for consideration by both practitioners and policy makers.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by the Macquarie University Human Ethics Research Committee. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study. Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

Author contributions

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Improving quality of teaching and child development: A randomised controlled trial of the leadership for learning intervention in preschools

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Introduction: Substantial research indicates that high quality early childhood education and care (ECEC) confers a wide range of benefits for children, yet quality in ECEC remains inconsistent. Given the variability in training and qualifications, one strategy for improving ECEC quality is in-service professional development (PD).

Methods: The current study evaluated an evidence-based in-service PD programme, Leadership for Learning, via a cluster randomised controlled trial involving 83 ECEC services and 1,346 children in their final year of pre-school.

Results: Results indicated significant improvements in teaching quality across treatment centres and child development outcomes in language, numeracy and social-emotional development.

Discussion: This study provides strong support for making evidence-informed PD routinely available for ECEC practitioners.

KEYWORDS

early childhood, professional development, intervention, randomised controlled trial, quality rating scales, child development

Introduction

A growing number of studies that examine the association between early childhood education and care (ECEC) and children's developmental outcomes have demonstrated that children who attended preschools tended to show better early academic attainment and social–emotional wellbeing than those who did not attend (Sylva et al., 2004, 2014; Melhuish et al., 2015; Lehrl et al., 2016). The positive effects of ECEC provision on individuals have also been shown to last into adolescence (Sylva et al., 2014). Quality is important, yet there is variability in this across the sector including in teachers' characteristics, classroom and preschool structural features and social-cultural contexts (Alexandersen et al., 2021).

Many staff, therefore, do not possess the necessary skills and knowledge to support children's effective learning in ECEC programmes (Howes et al., 2008). Their lack of practical and theoretical knowledge of how children develop and learn renders them unable to justify their practice, promote children's learning and defend their own professionalism (Stephen, 2012). Consequently, increasing attention has been focused on teacher professional development (PD), which might improve teachers' instructional quality and thereby impact children's learning and development (Darling-Hammond et al., 2017; Egert et al., 2018).

A variety of in-service PD approaches—such as lectures, workshops, coaching, mentoring and professional learning communities—have been advocated to improve teaching and learning (OECD, 2016); however, most of them have been limited to a specific learning area. Relatively little is known about the effectiveness of comprehensive PD programmes (Egert et al., 2018). Accordingly, this study aimed to implement and evaluate an evidence-based, in-service PD programme to provide sustainable, practical, relevant support for preschool staff, and to improve teachers' pedagogical quality and children's developmental outcomes using quality rating scales supported by training through PD workshops.

Literature review

Combining relational and intentional pedagogies for better child development

Increasing research has demonstrated that the *process* quality of ECEC is an important predictor of early childhood development (Hatfield et al., 2016; Siraj et al., 2018). Effective pedagogical practice, which include sensitive teacher-child interactions around curricula content in a positive climate, is a key element of process quality (Howes et al., 2008). This definition of effective pedagogical practice aligns with Kingston and Siraj (2017) work, which explores teachers' pedagogical practice from two perspectives: relational and intentional pedagogies. The former refers to teachers' beliefs and actions in building an emotional and individual relationship with children; while the latter focuses on teachers' knowledge and intention to help children develop knowledge, skills and dispositions. Effective teachers integrate positive relationships with educational intention and combine intentional instruction with warm and respectful interactions (Howes and Tsao, 2012; Kingston and Siraj, 2017).

In order to explore how pedagogical practice works on child development, Nguyen et al. (2020) conducted a large-scale investigation that involved 1,498 children from 156 classrooms from varied cultural and linguistic backgrounds. They found that teacher-child relationships and intentional pedagogy worked independently and synergistically to promote children's academic, cognitive, and social–emotional outcomes. For one thing, continuing warm, respectful and supportive teacher-child relationships are the foundation of effective pedagogy—as

scaffolding child development within children's zone of proximal development (ZPD) is based on teachers' sound understanding of children's individual characteristics, e.g., learning style, interests and preferred learning areas (Vygotsky, 1978; Kingston and Siraj, 2017). Further, within positive relationships, effective pedagogy also requires high-quality intentional pedagogical interactions which aim to scaffold children's learning and thinking (Siraj and Kingston, 2015). When teachers model language use, scaffold children's conceptual understanding and provide feedback within pedagogical interactions, they influence children's language skills, thinking and early academics (Hatfield et al., 2016). In addition, the combination of relational and intentional pedagogies enables responsible and responsive practices that not only meet children's needs but also purposefully develops children's minds in different socio-cultural contexts. It aligns with competence models that require teachers to support children's knowledge, skills and attitudes corresponding to the context, such as personal fulfilment, social inclusion and citizenship (Urban et al., 2012).

This construct of pedagogical quality is supported by attachment theory (Bowlby, 1969) and social constructivist theory (Vygotsky, 1978). According to the attachment theory, children with a secure relationship with their caregivers will be open to using their caregivers' help to develop skills. In classrooms, teachers act as alternative caregivers who can promote children's development by fostering positive teacher-child relationships. Meanwhile, the social constructivist theory (Vygotsky, 1978) regards knowledge as constructed through interacting with (more knowledgeable) others. Knowledge is built when individuals experience progressively more complex interactions with teachers (or peers). Accordingly, it could be argued that PD programmes seeking to enhance effective teaching and learning should combine relational and intentional pedagogies to improve teacher-child interactions and child-developmental outcomes.

Promoting pedagogical quality and child development through professional development programmes

Professional development is a process involving teachers learning and then applying what they have learnt to practice—to support children's learning (Avalos, 2011). High quality and continuing PD can supplement teachers' theoretical learning (usually obtained through their formal education) and equip them with newly-adapted knowledge and strategies which are more relevant to real teaching practices (OECD, 2012; Manning et al., 2019). Participating in effective PD programmes that can promote teachers' professional knowledge, skills and attitudes is the primary approach to in-service teachers' learning (Fukkink and Lont, 2007; Siraj et al., 2018).

Diverse PD programmes (e.g., workshops, coaching and professional learning communities) have been designed to develop teachers' knowledge base of child development and teacher-child interaction for the enhancement of their pedagogical practices

(e.g., Burchinal et al., 2002; Buysse et al., 2010; Sedova et al., 2016; Early et al., 2017; Gore et al., 2017). Recent meta-analyses on in-service PD and child development demonstrated that improvement of pedagogical quality was related to children's developmental outcomes and that enhancing pedagogical quality was the key mechanism for promoting child development (Werner et al., 2015; Egert et al., 2018). Relational and intentional pedagogy are two distinct foci of current PD programmes targeting enhancing pedagogical quality and benefiting child development.

Some programmes emphasise relational pedagogy and aim to promote teacher-child relationships and children's social–emotional development by training teachers to provide responsive and supportive interactions (e.g., Sandilos et al., 2018; Rudasill et al., 2020). For example, Rudasill et al. (2020) conducted a PD intervention to promote higher quality teacher-child relationships by improving teachers' understanding of temperament. They found that the improved teacher-child relationship facilitated children's social–emotional and self-regulation skills. Sandilos et al. (2018) also observed that reduced professional stress after PD could predict teachers' higher emotional support for children. Teachers who have attended training related to teacher-child relationships and emotional support tend to conduct more child-sensitive, emotionally supportive learning environments to meet children's interests and needs. Relational pedagogy helps staff to interact with young children in a shared, stimulating and meaningful manner (Siraj-Blatchford et al., 2002; Ansari and Pianta, 2018).

Meanwhile, McCoy and Wolf (2018) found that improvements in instructional aspects of classroom quality predicted children's academic *and* social–emotional gains, while the social–emotional dimensions of quality did not. Therefore, some programmes emphasise intentional pedagogy and aim to promote instructional support and children's academic development by providing higher quality learning-oriented interactions (e.g., Sedova et al., 2016; Gore et al., 2017). For example, Sedova et al. (2016) provided knowledge, learning activities and examples of teaching practice to promote teachers' dialogic teaching through workshops, documentation and reflective interviews. Teachers used more high-cognitive, challenging questions and open discussions to foster students' reasoning after the PD. Wasik and Hindman (2018) promoted teachers' instructional quality and use of vocabulary strategies and children's vocabulary development by implementing a book-reading intervention for teachers. PD programmes focusing on intentional pedagogy help teachers obtain practical teaching knowledge *and* provide high-quality instructional support for children's learning.

Therefore, most research on the effects of PD related to child outcomes focuses on a particular domain, rather than taking a holistic perspective of teachers' pedagogical practice and child development. A relatively comprehensive perspective to integrate intentional and relational pedagogy could be employed. Besides, specialised PD cannot always guarantee its effectiveness on child development due to its diverse content, different expertise of tutors and the varying training organisation or structure (Siraj

et al., 2018). Buysse et al. (2010) reported significant improvement in teachers' teaching practices but minimal effect on child development. The mixed and inconclusive findings warrant further research to integrate the teacher-child relationship with pedagogical interaction and to examine whether and how PD programmes may influence children's learning and development.

The study programme of *leadership for learning*: An evidence-based professional development programme

To identify the key requirements for designing effective PD programmes, Buysse et al. (2009) identified three critical components of effective PD programmes: the "who," "what," and "how" of PD intervention. "Who" refers to the receivers, providers and context of a PD programme; "what" focuses on the content of PD—such as the targeted knowledge, skills and attitudes that the PD programme aims to achieve and 'how' includes the duration, training approaches and training formats. Based on Buysse's model, Egert et al. (2018) conducted a meta-analysis to analyse three components of PD and found different combinations of the components generated different results of PD. This framework was used to develop and define the components of this study's *Leadership for Learning* PD programme.

Furthermore, the *Leadership for Learning* programme was also informed by the findings from empirical evidence in effective PD and high-quality ECEC provision. It aims to improve the quality of teaching and learning by preparing teachers for a leadership role within their classrooms and preschools. Empowering teachers to take leadership roles has powerful influences on teachers' motivation and self-esteem, which leads to a higher retention rate and quality of teaching (Muijs and Harris, 2003). Leadership emerges when teachers attain strong pedagogical and content knowledge, collaborative skills and the ability to influence their colleagues (Snell and Swanson, 2000). These elements foster teachers' leadership and have been included in the "Leadership for Learning" PD programme. It aligns with the framework of PD programmes showing these distinctive features of PD in the extant literature. Zaslow et al. (2010) collated previous research which had shown a number of other potential influences on the quality of PD practice, and identified six features of more-effective programmes:

- *Clear, articulated objectives for the PD.*
- *Explicit focus on practice in the PD, based on staff knowledge and practice.*
- *Collective participation by staff from the same settings.*
- *Intensity and duration of the PD matched the content.*
- *Staff prepared to engage in assessments and interpret their results as a tool for ongoing monitoring of the effects of the PD.*
- *Appropriate for the setting context and aligned with standards for practice*, p. xii-xiv.

Darling-Hammond et al. (2017) also stressed the importance of content, active learning, modelling effective practice, coaching, and feedback: many of these dimensions are implicit or explicit in a range of the extant research literature. Taking these elements into account, the Leadership for Learning programme was developed in the Australian ECEC context. In Australia, the National Quality Framework (NQF) was implemented by the Children's Education and Care Quality Authority (Australian Children's Educational and Care Quality Authority, 2018) to rate ECEC services by four levels: needing significant improvement; working towards National Quality Standards (NQS); meeting NQS and exceeding NQS. There is a fifth excellent rating category which has to be applied for, but it is very rare (Siraj et al., 2018). The Leadership for Learning programme was constructed against this background to provide PD for early childhood programmes with a variety of quality ratings. Teachers from these early childhood programmes were given the opportunity to receive the PD.

Regarding the "what" component, the programme was developed with close reference to recognised quality rating scales the Early Childhood Environmental Rating Scale–Extension (ECERS-E) and the Sustained Shared Thinking and Emotional Wellbeing (SSTEW), and the NQS (Siraj et al., 2018). Previous studies have shown that PD with a specific focus is more effective than PD with a generic focus on pedagogy (Buysse et al., 2009), and PD, which focuses on improving relational and intentional teacher-child interaction, is especially effective at improving teachers' quality of teaching (Fukkink and Lont, 2007). Given these findings, the Leadership for Learning programme tailored its PD content to focus on measuring the quality of the curriculum, interaction in relational and intentional pedagogy—as well as children's cognitive and social–emotional development—to meet the preschools needs and contexts.

Regarding the "how" component, the Leadership for Learning programme used different types of PD approaches to equip teachers with skills and knowledge related to teacher-child interaction, child assessment and pedagogy through on-site modelling, providing DVD exemplars and guided deconstruction of high-quality interaction, and providing reading materials as well as training on the use of the two quality rating scales for in-centre practice improvement (Siraj et al., 2018).

These approaches are supported by existing literature. For instance, face-to-face training has been shown to generate enhanced teacher-child interactions and improved language, social and physical development amongst children (Pianta et al., 2008; Downer et al., 2009). Teachers tend to implement improved instructional practices when they receive mentoring and coaching in PD (Gore et al., 2017; Kraft et al., 2018). And, based on the findings of their meta-analysis, Egert et al. (2018) suggest that a 45–60 h PD course is more effective than shorter or longer programmes.

On this basis, Leadership for Learning consists of 2-days' intensive face-to-face training, five 4-h face-to-face workshops, and follow-up web-based intervention to ensure and sustain the training effects. To bridge the gap between theories and teaching practice, the programme provides training sessions to update teachers' knowledge of high-quality teaching, takes teaching

guidance to teachers' real workplaces, segments teachers' changes into continuous phases and encourages teachers' reflections (Sedova et al., 2016).

For example, in the adaption phase, more opportunities and individualised feedback are provided for teachers to practice what they have learned from trainers, and to reflect on their implementation (Joyce and Showers, 2002; Kraft et al., 2018). After each training phase, teacher participants are invited to participate in individual interviews and to complete questionnaires to gauge their reflections and understand their needs in the next stage.

Overall, this study aims to evaluate whether the Leadership for Learning PD programme can generate substantial and practical improvements in teachers' pedagogical quality—and, hence, child outcomes—in one state in Australia. The training and use of two quality rating scales that teachers can refer to and self-rate on also aims to democratise assessment for improvement.

Theoretical frameworks for analysing the effects of professional development programmes

Some previous studies have attempted to understand how PD programmes may influence teachers' knowledge, their practice and children's development (e.g., Harris, 1980; Guskey, 1986; Clarke and Hollingsworth, 2002; Egert et al., 2018). For example, Clarke and Hollingsworth (2002) constructed a comprehensive model, *the interconnected model of teacher professional growth*, which involves changes in (i) personal attributes (changes in knowledge, belief and attitude); (ii) professional practice (changes in professional experimentation); (iii) direct consequences (changes in students' learning motivation and learning outcomes, and teachers' pedagogical practice); and (iv) external context (changes in information and stimuli, such as relevant readings and conversations).

The underlying mechanism aligns with the theory of change (TOC), which can be used to examine whether, how and why a PD programme works/fails. TOC specifies how initiatives generate desired outcomes and the contextual conditions which influence the process (Connell and Kubisch, 1998). According to TOC, a programme can lead to early, interim and long-term outcomes, while the earlier changes can precede the interim and long-terms ones (Connell and Kubisch, 1998). As indicated by Clarke and Hollingsworth (2002), child development is the ultimate goal, which can be realised after teachers improve their knowledge and pedagogical practice *via* PD programmes. Markussen-Brown et al. (2017) employed TOC to indicate that PD could improve children's development as teachers' training outcomes would lead to improved structural features of classrooms (e.g., the provision of learning materials and establishment of targeted learning centres) and process quality (e.g., instructional strategies and teacher-child interaction).

At the same time, contextual factors also impact PD programmes and have the potential to achieve the desired outcomes (Connell and Kubisch, 1998). Various individual and social–cultural, and structural factors might influence teachers'

willingness to participate in or apply what they have learned into practice, thus affecting PD effectiveness (McConnell, 2022). For example, teacher-child interaction differs between boys and girls and girls tend to receive more positive attention than boys, which moderates the PD effects (Consuegra and Engels, 2016). Considering the aforementioned PD impacts and personal and contextual factors, TOC has been employed in this research to guide the analysis of PD impacts on pedagogical quality, child development and possible influencing factors. In particular, it was guided by the following research questions:

1. What are the impacts of the *Leadership for Learning* PD on pedagogical quality?
2. What are the impacts of the *Leadership for Learning* PD on children's language and numeracy skills?
3. What factors affect the impacts of the *Leadership for Learning* PD on child development?

Materials and methods

Study design

The Fostering Effective Early Learning (FEEL) study—pre-registered with Australian New Zealand Clinical Trials Registry (ACTRN12616000536460) and protocols published in advance (Melhuish et al., 2016)—employed a cluster randomised controlled trial (RCT) design. Ninety ECEC centres in metropolitan and regional areas in NSW, Australia, were recruited to ensure representation across government quality ratings, geography, service type and socioeconomic area. The study recruited classrooms in the year before school entry.

The sequence of the study is depicted in Figure 1. After centre recruitment, quality ratings were conducted at the end of the year prior to the PD intervention programme. This was to ensure quality ratings were taken at the same time of year—when the educators were most familiar with the children—both before and after the intervention. Centres were then randomly assigned to one of two groups: (a) an intervention group ($n = 45$ centres) which would receive the PD intervention and (2) a control group ($n = 45$ centres) which would continue engaging in typical classroom practice. Data collectors, blinded to group allocation, conducted baseline child assessments early in the intervention year. Post-intervention child assessments and quality ratings were conducted at the end of the 7-month intervention period. Ethical standards were followed rigorously *via* university ethics committee and regular consultation with funders and researchers. Centres, educators and parents were provided written consent as a condition of participation, and children provided their verbal assent.

FIGURE 1
The design of the cluster RCT examines the efficacy of the leadership for learning professional development.
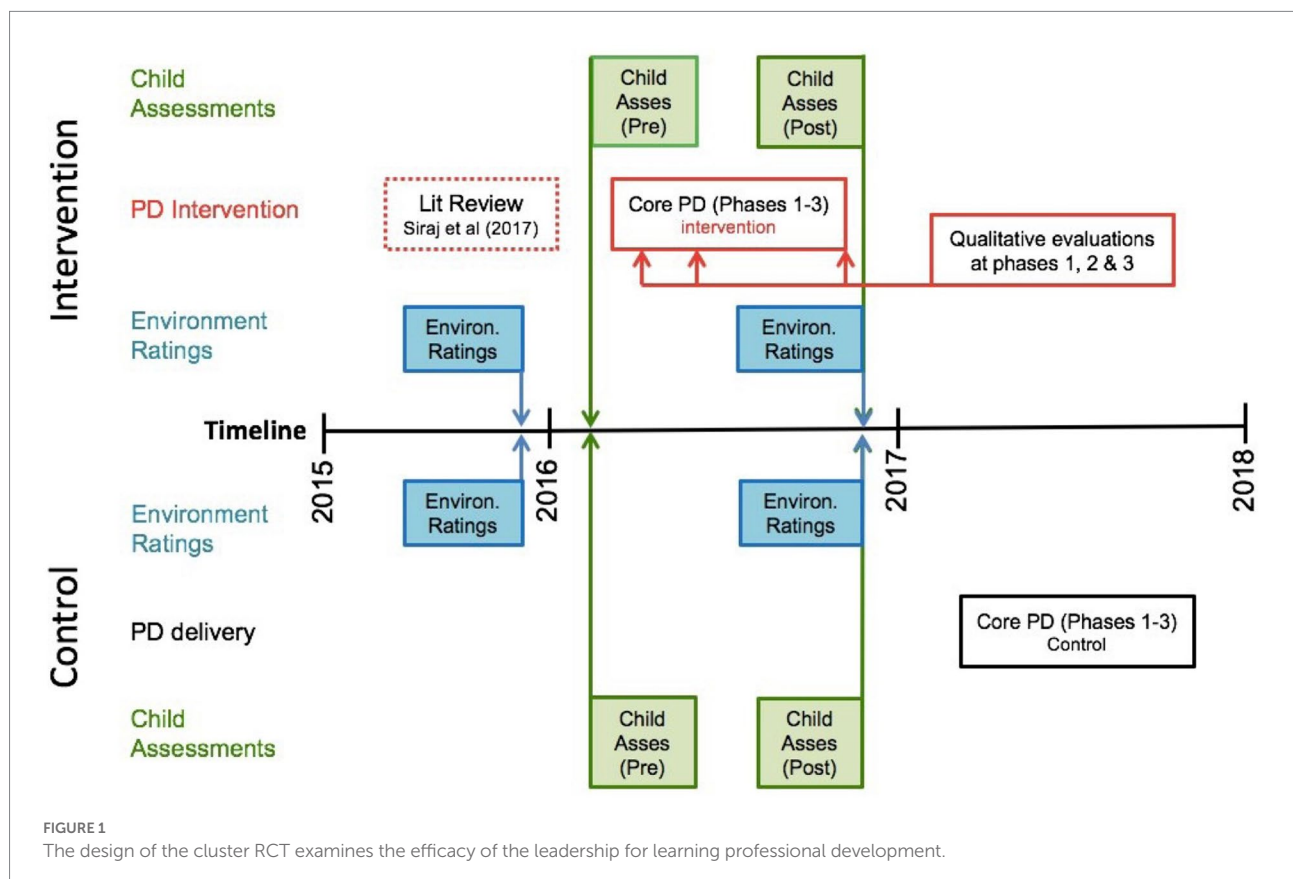
TABLE 1 Final sample centre characteristics by group.

	Intervention	Control
Number of centres	38	45
# of pre-school rooms	39	54
Geographic location	18 regional, 20 metro	18 regional, 27 metro
Service type	28 long-day care, 10 preschools	31 long-day care, 14 preschools
NQS rating	9 WT, 9 M, 19 E, 1 UR	12 WT, 14 M, 18 E, 1 UR
SEIFA decile	$M = 3.84$ (45% decile 1–3)	$M = 3.89$ (49% decile 1–3)

NQS refers to statutory National Quality Standard, against which centres are rated. Ratings refer to working towards (WT), meeting (M), exceeding (EX), or unrated (UR) against this Standard at the time of recruitment. SEIFA is an area-level socioeconomic status index, given here as decile, developed by Australian Bureau of Statistics (ABS) (2016a).

TABLE 2 Child characteristics in intervention/control group.

Variable	Level	Control		Intervention		value of p
		N	%	N	%	
Sex	Male	372	55.6	363	53.6	0.498
	Female	297	44.4	314	46.4	0.498
Mother's education	Less than high school	66	10.2	79	12.3	0.273
	High school or equivalent	188	29.0	189	29.3	0.943
	Diploma	122	18.8	110	17.1	0.456
	University or higher	272	42.0	266	41.3	0.851
Income band	Low	169	29.4	159	27.6	0.532
	Middle	228	39.7	218	37.8	0.554
	High	178	31.0	200	34.7	0.202
First language	English	616	92.1	618	91.3	0.669
	Other language	53	7.9	59	8.7	0.669
Aboriginal status	No	641	95.8	657	97.0	0.284
	Yes	28	4.2	20	3.0	0.284
Pension card status	No	525	78.5	538	79.5	0.704
	Yes	144	21.5	139	20.5	0.704

Participants

Centre characteristics

Ninety ECEC centres were recruited from areas surrounding one metropolitan hub ($n = 45$) and two regional hubs ($n = 45$) in Australia. These were largely balanced in geographic location (42 regional, 49 metropolitan) and National Quality Standard (NQS) ratings (25 working towards, 27 meeting, 37 exceeding, 2 not yet rated). The centres were intentionally unbalanced in service type (64 long-day care, 27 preschool), to mirror the sector in the state (Australian Bureau of Statistics (ABS), 2016b). Disadvantaged areas were deliberately oversampled (46% from deciles 1–3, 54% from deciles 4–8, based on the Australian Bureau of Statistics' Socioeconomic Indexes for Areas, or SEIFA; Australian Bureau of Statistics (ABS), 2016a).

After the baseline ECERS-E (Sylva, 2010) and SSTEW (Siraj et al., 2018) quality ratings had been completed in each

participating classroom, centres were randomly assigned to the intervention or control group. Following this, seven centres assigned to the intervention group (17%) withdrew from the study because they did not have the capacity to attend the PD: two had maternity leave for key staff and five had key staff resign, which is typical of staff turnover in the sector (United Voice, 2014). All dropouts occurred before commencing the PD, resulting in an intervention group containing 38 ECEC centres: the final sample's characteristics are presented in Table 1.

Child characteristics

The final sample comprised 1,346 children aged 4 to 5 years, with an average cluster size of 14 per room with whom child assessments were conducted (see Table 2). This corresponded to a consent rate of 57% amongst those invited to participate and a participation rate of 96% amongst consented children. Non-participation was due to absence at time of assessment ($n = 56$ children) or early withdrawal from the centre ($n = 8$

TABLE 3 Baseline and follow-up ratings by group.

Sub/Scale	Control			Intervention		
	Baseline	Post-test	Chg	Pre-test	Post-test	Chg
ECERS-E	3.09 (0.94)	3.19 (1.12)	+0.10	3.17 (1.03)	4.03 (1.25)	+0.86*
Literacy	3.81 (1.12)	3.79 (1.17)	−0.02	3.89 (1.05)	4.76 (1.21)	+0.87*
Mathematics	2.83 (1.20)	3.24 (1.57)	+0.41	2.87 (1.17)	4.31 (1.66)	+1.44*
Science	3.08 (1.18)	3.19 (1.24)	+0.11	3.19 (1.36)	4.08 (1.64)	+0.89*
Diversity	2.65 (1.02)	2.54 (1.01)	−0.11	2.74 (1.27)	2.99 (1.04)	+0.25
SSTEW	3.96 (1.25)	3.83 (1.28)	−0.13	4.00 (1.21)	4.90 (1.36)	+0.90*
Building T,C,I	4.89 (1.30)	4.47 (1.44)	−0.42	5.03 (1.14)	5.56 (1.25)	+0.53*
Soc-Emo W-B	4.09 (1.70)	4.06 (1.60)	−0.03	4.10 (1.70)	5.15 (1.66)	+1.05*
Lang-Comm	4.44 (1.34)	4.16 (1.53)	−0.28	4.49 (1.24)	5.43 (1.32)	+0.94*
Learn-Critical	2.98 (1.38)	3.03 (1.31)	+0.05	3.08 (1.40)	4.25 (1.61)	+1.06*
Assessing	3.40 (1.48)	3.41 (1.37)	+0.01	3.28 (1.50)	4.10 (1.66)	+0.82*

ECERS-E, average of ECERS-E subscale scores for a given room; SSTEW, average of SSTEW subscale scores for a given room. A score of 1 is considered inadequate, 3 as basic, 5 as good and 7 as excellent quality. Asterisks (*) next to change values denote significant pre-to post-test change according to paired samples t-tests. ECERS-E indicates average change score (baseline to post-intervention) across all ECERS-E subscales. SSTEW indicates average change score across SSTEW subscales. Build TCI, building trust, confidence and independence; SE Wellbg, social–emotional wellbeing; Lang-Comm, supporting and extending language and communication; Learn-Crit, supporting learning and critical thinking. Assessing, assessing learning and language.

children). The final sample had an average age of 4.59 years at baseline (SD = 0.37; range: 3.10–5.69 years) and a slight over-representation of boys (n = 735, 55%). Available socio-demographic data (reported for 96% of children) indicated that parents were born predominantly in Australia (87%), were English-speaking at home (90%), and had a range of maternal education levels (42% with a degree or higher, 18% with a diploma or certificate, 40% completed high school) and family income (20% low, 46% middle and 34% high, as defined by Australia's Defined Child Benefit income thresholds). Children identified as Aboriginal or Torres Strait Islander (4%) were slightly under-represented relative to the general population (6%; Australian Bureau of Statistics (ABS), 2011). As shown in Tables 2, 3 there was no significant difference in child characteristics between the intervention and control groups.

Professional development intervention

The PD programme focused on enhancing the quality of staff interactions and on improving relational and intentional pedagogy with children. The programme, delivered in three phases over 7 months, provided opportunities to observe, discuss, practice and reflect on important attributes of the effective educator's role, including: engaging in high-quality interactions and sustained, shared thinking (SST), developing and extending concepts and modelling critical and reflective thinking. Links were made to appropriate frameworks, including the Australian NQS and the Australian EYLF. Fundamental to each session was an evidence-based understanding of how young children learn best. The PD was designed to support the collective participation of attendees and to promote collaborative working to gain a deeper knowledge

of leadership, change management, quality improvement and self-assessment through two quality rating tools, the ECERS-E and the SSTEW.

The PD content was informed by the pre-assessment of classroom quality measured by ECERS-E and SSTEW, it emphasised relational and intentional pedagogies and high-quality interactions that have demonstrated impact on children's outcomes (Siraj-Blatchford et al., 2002). Results from the pre-assessment showed that teachers' performance on literacy, mathematics, science, diversity and supporting critical thinking was on average, minimal quality, thus support for teachers' knowledge and understanding of effective ECEC pedagogical practices in these aspects. The PD programme focused on eight areas: (1) robust research about quality in ECEC and its assessment; (2) high-quality interactions which extend children's development; (3) the relevance of self-regulation to children's educational success; (4) the links between early language development and later literacy; (5) mathematical and scientific concept development in the early years; (6) different ways to use observation, assessment of practice and planning to improve quality; (7) the importance of the early home learning environment and connections across ECEC settings and the home learning environment and (8) the relevance of leadership learning for children's development—and ways to improve it through the use of self-assessment and planning using the training and the two scales. The PD programme focused on these eight areas to improve teachers' interaction (process) quality and pedagogical content knowledge that would prepare the teachers for leadership roles within their classrooms and those of their peers. Intentional and relational pedagogies were integrated into these eight areas by introducing the research on effective pedagogy, DVD clips modelling how to relationally and

intentionally interact with children to develop their language, mathematics and scientific concepts, and using self-assessment in the PD programme.

The programme was then delivered in three phases at three central hubs. The sessions were conducted by four of the study's researchers, who are international experts in ECEC. The face-to-face sessions were delivered in a group setting for the centres nearest to each hub.

Phase 1: intensive professional development (week 1 to week 3, delivered at three hubs)

A two-day, intensive, face-to-face training provided: an overview of national and international research; an introduction to relevant pedagogical quality characteristics through the use of the ECERS E and SSTEW quality rating scales; coverage of key concepts and ideas; strategies to foster early language, cognitive, self-regulatory and social development; methods of engaging in high-quality interactions and strategies for working with families.

Phase 2: follow-up professional development (week 3 to month 3, delivered at three hubs)

Five 4-h, half-day, face-to-face sessions, delivered every 2 weeks, beginning 2 weeks after a hub had completed phase 1. The sessions included time for reflection; planning and critical analysis; an introduction to knowledge and pedagogical content about areas not covered in Phase 1.

Phase 3: model for sustainability (week 3 to month 7, delivered online)

To promote centre persistence, limit the effects of staff turnover and increase the likelihood of a positive impact, PD support was provided for the full 7-month intervention through online modules (beginning at the end of phase 1 and continuing for 7 months). Activities and resources for Phase 3 were designed to promote staff engagement and establish an online community of educators. Online modules combined video-streamed PD PowerPoints and content with questions and text, including links to activities and a discussion forum. Staff participation and discussions, moderated and supported by the research team, fed into a learning portfolio, tracking and reflecting how their ideas about pedagogy, children, families and communities changed. Access to this online environment was provided to all centre staff, not only those attending Phases 1 and 2.

Measures and procedure

Measures were selected to evaluate intervention effects at two levels: the environmental quality fostered by educators which the PD targeted directly and the diverse child outcomes which the PD targeted indirectly *via* changes in educator practice. Primary outcomes at room level were established through ECERS E and SSTEW standardised quality rating scales. A range of child measures were selected to include outcomes important for school readiness (e.g., literacy, numeracy, self-regulation, and social development).

Quality ratings

To evaluate the effects of the PD on educators' classroom practice, quality ratings (using the two established scales with predictive validity; Sylva et al., 2006; Howard et al., 2018) were conducted by highly trained observers through a one-day observation of each preschool room in the participating ECEC centres. All observers were required to achieve a rigorous standard of inter-rater reliability with a highly experienced observer, as indexed by: an intra-class correlation in ratings >0.70 ($M = 0.86$); a mean difference in ratings <0.75 ($M = 0.43$) and at least 80% of item ratings within 1 point ($M = 93\%$). In all cases, the researchers involved in collecting baseline and outcome data were blinded to centres' group allocation.

Early childhood environment rating scale-extension

The ECERS-E measures the quality of the curricula, environment and pedagogy in ECEC settings (Sylva et al., 2006). It comprises 15 items which yield four subscales: (1) literacy, (2) mathematics, (3) science and environment, and (4) diversity. Every ECERS-E item is rated from 1 (inadequate practice) to 7 (excellent practice) derived from observers' on-balance judgments about the presence or absence of the scale's quality indicators across a one-day room observation. ECERS-E has been shown to have good reliability and predictive validity of child-development progress at school entry (Sylva et al., 2006). Items in each subscale were averaged to create subscale scores. Subscales were averaged to generate an overall scale score.

Sustained shared thinking and emotional wellbeing scale

The SSTEW scale brings together different dimensions of the ECEC environment to consider pedagogy which supports children under five in developing skills in sustained shared thinking and emotional wellbeing (Siraj-Blatchford et al., 2015). The scale contains 14 items across five subscales: (1) building trust, (2) confidence and independence, (3) social and emotional wellbeing, (4) supporting and extending language and communication and (5) supporting learning and critical thinking and assessing learning and language. Like the ECERS-E, each scale item is rated from 1 (inadequate) to 7 (excellent) based on the pattern of the presence/absence of the item's quality indicators. SSTEW has been shown to have good reliability and predictive validity of child development (Howard et al., 2018). Items are averaged to yield subscale scores, and the subscales are averaged to generate an overall scale score.

Child assessments

In total, the child outcome measurements involved 40–50 min of direct assessment per child (split into two sessions) and educator social–emotional ratings of the children at both data collection time points. In all cases, a highly trained fieldworker, who was blind to environmental assessments and group assignments conducted child assessments in a quiet area in the child's ECEC centre. Assessor training involved full-day training

on the assessments, expert observation and feedback from the administration and ongoing feedback from regular quality control checks of the data.

Language development

The first language assessment—the Verbal Comprehension subtest of the Differential Ability Scales (DAS-II; Elliott, 2007) – comprises 42 items which ask children to identify and manipulate objects in response to verbal instructions. Assessment continues until the earlier completion or non-satisfaction of a performance threshold at identified stop rule junctures. The DAS-II is appropriate for use from 2.5 to 17 years of age, and has shown good reliability (internal consistency, test–retest reliability) and validity (concurrent, predictive) in children within and outside typical development ranges (Elliott, 2007). The second language assessment, the Early Years Toolbox (EYT) Expressive Vocabulary (Howard and Melhuish, 2016), is a 54-item measure of a child's expressive vocabulary which requires children to produce verbally the correct label for each depicted stimulus. The measure ceases at the earlier of completion or six consecutive incorrect responses. This assessment has been used successfully with children aged 2.5 to 6 years, with good internal consistency and convergent validity in a large and demographically diverse sample (Howard et al., 2018).

Numeracy development

The first numeracy assessment, Early Number Concepts subscale of the DAS-II, contains 33 items and requires children to count, identify digits and quantities, perform basic mathematical operations and demonstrate knowledge of basic numerical concepts. Administration rules and assessment properties parallel those for Verbal Comprehension. The Early Number Concepts subscale of the Differential Ability Scales has good internal consistency and concurrent validity (Elliott, 2007). In addition, four Preschool Early Numeracy Scale (PENS) subscales were administered to capture elements of early numeracy not assessed in the DAS-II. These were: one-to-one counting; counting subsets; number order and set-to-numerals. A total of 21 PENS items were administered: PENS is designed for use with children from 3 years of age and has good reliability and predictive validity (Purpura and Lonigan, 2015).

Analysis strategy

The effects of the PD intervention on quality ratings were analysed by linear regression models, initially across the full sample (i.e. *intention-to-treat*), after controlling for other variables which might also account for observed differences (geography, service type, NQS rating, area-level SES, quality ratings at baseline). To consider the effect of the PD amongst those centres which maintained a minimum threshold of participation (to examine its effect more accurately with adherence), these analyses were repeated with *a per-protocol* sample.

To examine the impact of PD on children's development outcomes, analyses were conducted that compared the difference between post-and pre-intervention test scores. Initially, this was undertaken using simple uncontrolled comparisons between intervention and control groups. Subsequent comparisons between intervention and control groups controlled for a range of covariates, including child gender, mother's education, family income, first language status, aboriginal status and receipt of benefits (pension card). The randomised controlled trial involved 1,346 children in 83 centres: 38 centres received the intervention, whilst 45 centres acted as controls. The unit of analysis was children attending the centres.

Mixed-effect linear regression models were used with a random effect fitted for cluster (i.e. childcare centre), which accounted for clustering of repeated assessments within individuals and clustering of individuals within centres. Models were fitted to multiply imputed and complete cases data.

To allow for the fact that there was some missing data in the covariates, multiple imputation was used. Ten multiply imputed data sets were generated using the Amelia package for R. (Honaker et al., 2011; R Core Team, 2020). All outcomes and covariates were included in the multiple imputation model. Models were fitted to the multiply imputed data sets and results were consolidated using Rubin's (1987) rule, using Hesterberg's estimate for the degrees of freedom (Hesterberg, 1998).

Results

The impacts of the professional development programme on pedagogical quality

Descriptive analysis

After the PD programme, significant changes were observed in the intervention group regarding all of the subscales of SSTEW and ECERS-E except diversity, while there were no significant differences in the scores changes in the control group (all $ps > 0.05$). In particular, the scores change in the intervention group ranged from 0.25 to 1.44 (all $ps < 0.05$ except ECERS-E diversity). The scores of ECERS-E mathematics showed the most changes (change = 1.44, $p < 0.05$), followed by SSTEW learning and critical thinking (change score = 1.06, $p < 0.05$). Meanwhile, the SSTEW building trust, confidence and independence showed the least but significant changes (change score = 0.53, $p < 0.05$), followed by SSTEW assessing (change score = 0.82, $p < 0.05$). However, ECERS-E diversity showed the least and non-significant changes (change score = 0.25, $p > 0.05$).

Full sample (intention-to-treat) evaluation

Efficacy of the Leadership for Learning intervention for effecting positive change in ECEC quality was evaluated using regression analyses, adjusting for geography, service type, NQS rating, area-level SES and baseline quality ratings, across the full

TABLE 4 Standardised beta weights for predictors of post-intervention ECERS-E and SSTEW ratings, intention-to-treat.

	ECERS-E					SSTEW					
	Overall	Literacy	Math	Science	Diversity	Overall	Build T,C,I	Soc-Emo	Lang	Lear-Crit	Assessing
	Std. B	Std. B	Std. B	Std. B	Std. B	Std. B	Std. B	Std. B	Std. B	Std. B	Std. B
Intention-to-treat											
Group	0.31*	0.35*	0.29*	0.26*	0.20*	0.35*	0.35*	0.29*	0.38*	0.35*	0.23*
Geog. Cat	0.06	0.08	0.09	−0.01	0.09	0.07	0.08	0.04	0.08	0.07	0.09
Service type	0.26*	0.28*	0.23*	0.19*	0.30*	0.27*	0.30*	0.20*	0.27*	0.25*	0.26*
NQS rating	0.37*	0.31*	0.36*	0.39*	0.27*	0.42*	0.33*	0.47*	0.34*	0.38*	0.32*
SEIFA dec.	0.03	0.12	0.07	−0.02	−0.02	0.12	0.13	0.04	0.14	0.12	0.08
ERS T1	0.29*	0.29*	0.22*	0.23*	0.22*	0.32*	0.13	0.24*	0.25*	0.31*	0.49*
PD attend	0.36*	0.36*	0.35*	0.34*	0.20	0.37*	0.19	0.34*	0.34*	0.45*	0.33*

Initial regressions considered associations of group with subsequent quality, controlling for the complement of covariates. A subsequent regression removed the group variable and, instead, entered a PD attendance variable to investigate the association between level of PD attendance and subsequent quality, after controlling for this same complement of covariates.
*$p < 0.05$; **$p < 0.001$.

sample. The results indicated a significant effect of the intervention for both scales—ECERS-E: $F_{(6,92)} = 14.20$, $p < 0.001$, $R^2 = 0.50$, SSTEW: $F_{(6,92)} = 22.23$, $p < 0.001$, $R^2 = 0.61$—and subscales (all $ps < 0.05$). As shown below in Table 4, group was a significant predictor for all scales and subscales (βs ranging from.20 to.38). The control variables, except SEIFA and geographic category, also were significant predictors of quality levels in the expected manner (i.e. preschools, higher NQS and higher quality ratings at baseline were each associated with higher post-intervention quality ratings).

Participating sample (per-protocol) evaluation

Given that intention-to-treat analyses provide a generally conservative estimate of the intervention's effect (Gupta, 2011), subsequent intervention analyses typically consider those who met a sufficient threshold of PD participation and adherence to intervention protocols (a per-protocol evaluation). Per-protocol adherence was referenced against the study's requirement for at least two staff members from each centre to attend the face-to-face PD. To create an index of a centre's attendance, two core principles were considered: (1) that no face-to-face session was more important than another (thus, sessions were divided into half-days to provide a uniform metric) and (2) that there is additional benefit from a second (and third, etc.) educator attending the PD, although the degree of benefit is likely diminishing with each additional educator in attendance. As such, attendance was considered using the following formula: [(# of half-days attended by Educator 1) + ([# of half-days attended by Educator 2 * 0.50) + ([# of half-days attended by Educator 3 * 0.33)]. This generated a maximum score of 16.50, representing three educators attending all Phase 1 and Phase 2 sessions.

The mean attendance score for all intervention centres was 12.77 ($SD = 2.50$, range = 5.00–16.50). One centre did not attend Phase 1 at all. All other centres sent at least one educator, with most (86.8%) sending two or more educators. For Phase 2, most

centres (84.2%) had at least one educator attend all half-day sessions, four centres (10.5%) had an educator at 4 of the 5 sessions and two centres (5.3%) sent an educator to only 2 of the 5 sessions. Given this pattern of attendance, and stated attendance expectations, the minimum threshold to be included in per-protocol analyses was set at two educators attending the first two full days and at least half the half-days (10.50 points). This threshold removed three intervention centres from per-protocol analyses.

As shown in Table 5, results of the per-protocol regression analyses again indicated a significant effect of the PD intervention for all scales and subscales (βs ranging from 0.22 to 0.40). These effects remained after controlling for identified covariates. The size of the intervention effect, as indicated by standardised regression weights, was improved in nearly all cases (see Table 5).

The impacts of professional development on child outcomes

Table 6 shows the initial uncontrolled comparisons between the control and intervention groups for age and the child outcome variables. There were statistically significant pre-post differences between the control and intervention groups for the pre-post age gap, DAS early Number (M $control = 2.40$, M $intervention = 2.92$, $p < 0.05$), DAS verbal comprehension (M $control = 0.65$, M $intervention = 1.33$, $p < 0.05$) and Preschool Early Numeracy (M $control = 0.119$, M $intervention = 0.169$, $p < 0.001$). However, there was also a significant group difference for the Preschool Early Numeracy pre-test (M $control = 0.560$, M $intervention = 0.526$, $p < 0.05$). Specifically, the Preschool Early Numeracy scores in the control group were significantly higher than that in the intervention group before intervention.

TABLE 5 Standardised beta weights for predictors of post-intervention ECERS-E and SSTEW ratings, pre-protocol.

	ECERS-E					SSTEW					
	Overall	Literacy	Math	Science	Diversity	Overall	T,C,I	Soc-Emo	Lang	Lear-Crit	Assessing
	Std. B	Std. B	Std. B	Std. B	Std. B	Std. B	Std. B	Std. B	Std. B	Std. B	Std. B
Intention-to-treat											
Group	0.33*	0.37*	0.31*	0.29*	0.22*	0.38*	0.35*	0.32*	0.40*	0.40*	0.27*
Geog. Cat	0.07	0.08	0.11	0.02	0.11	0.07	0.08	0.04	0.09	0.08	0.10
Service type	0.24*	0.27*	0.21*	0.17*	0.28*	0.25*	0.29*	0.18*	0.25*	0.22*	0.24*
NQS rating	0.37*	0.30*	0.36*	0.40*	0.27*	0.41*	0.33*	0.47*	0.34*	0.38*	0.32*
SEIFA dec.	0.05	0.14	0.04	0.01	0.00	0.15*	0.14	0.08	0.16*	0.16*	0.11
ERS T1	0.28*	0.29*	0.22*	0.21*	0.22*	0.36*	0.13	0.28*	0.27*	0.35*	0.52*
PD attend	0.26	0.31	0.27	0.24	0.02	0.17	0.18	0.12	0.16	0.21	0.11

Initial regressions considered associations of group with subsequent quality, controlling for the complement of covariates. A subsequent regression removed the group variable and, instead, entered a PD attendance variable to investigate the association between level of PD attendance and subsequent quality, after controlling for this same complement of covariates.
$*p < 0.05$; $**p < 0.001$.

TABLE 6 Uncontrolled comparisons for age and outcome variables pre-and post-test difference by intervention/control group.

Outcome	Control		Intervention		Value of p	N missing	% missing
	Mean	SD	Mean	SD			
Pre-intervention age	4.592	0.378	4.589	0.361	0.898	0	0.00
Post-intervention age	5.174	0.374	5.177	0.360	0.860	4	0.30
Difference in age gap pre-and post-intervention	0.581	0.052	0.588	0.053	0.012 *	4	0.30
DAS early number pre-intervention	19.90	4.84	19.35	5.08	0.054	127	9.44
DAS early number post-intervention	22.30	4.65	22.27	4.83	0.932	126	9.36
DAS early number pre-post difference	2.40	4.24	2.92	4.11	0.037 *	212	15.75
DAS verbal comprehension pre-intervention	20.50	4.75	20.21	4.90	0.285	127	9.44
DAS verbal comprehension post-intervention	21.20	4.73	21.63	4.96	0.124	132	9.81
DAS verbal comprehension pre-post difference	0.65	5.12	1.33	5.00	0.025 *	216	16.05
EYT expressive vocabulary pre-intervention	27.72	6.81	27.70	6.91	0.953	146	10.85
EYT expressive vocabulary post-intervention	31.00	6.43	31.18	6.39	0.624	126	9.36
EYT expressive vocabulary pre- and post difference	3.27	3.90	3.29	3.60	0.916	228	16.94
Preschool early numeracy pre-intervention	0.560	0.252	0.526	0.269	0.023 *	126	9.36
Preschool early numeracy post-intervention	0.682	0.214	0.680	0.216	0.849	134	9.96
Preschool early numeracy pre- and post difference	0.119	0.173	0.152	0.169	0.001 **	217	16.12

Statically significant t-test value of ps comparing control and intervention groups: $*p < 0.05$, $**p < 0.01$.

While there were no significant differences between the groups in demographic characteristics, there is the possibility that the demographic characteristics of the groups may influence the comparisons between the control and intervention groups. Also, as there was a slight difference in the pre-to post-test age gap for the groups, this was also included as a covariate. Hence to be prudent, analyses were undertaken controlling for these covariates. This was done using mixed-effect linear regression models with a random effect for cluster (i.e. childcare centre), to adjust for any effects of such clustering of children. Models were fitted to multiply imputed and complete case data. The results are shown in Tables 6–9.

Early number concepts scores

As shown in Table 7, age, mother's education and aboriginal status did not influence the comparisons between the control and intervention groups regarding children's number concepts. However, gender (ß = −0.580, $p < 0.05$, 95% CI (−1.058,-0.101)), income band (ß = 1.032, $p < 0.05$, 95% CI (0.021, +1.913)) and first

TABLE 7 Results of the regression model of difference between pre-and post-intervention DAS early number concepts scores; models fitted to multiply imputed data (*N*=1,134) and to complete cases only (*N*=961).

		Imputed data			Complete cases		
		Beta	95% CI	Value of *p*	Beta	95% CI	Value of *p*
Group	Control	Reference level			Reference level		
	Intervention	+0.360	+0.208	+0.208	+0.208	(−0.551,+0.966)	0.587
Age difference		+4.862	(−1.345,+11.070)	0.125	+5.793	(−0.929,+12.514)	0.091
Sex	Male	Reference level			Reference level		
	Female	−0.580	(−1.058,-0.101)	0.018*	−0.549	(−1.069,-0.029)	0.038*
Mother's education	Less than high school	Reference level			Reference level		
	High school	+0.392	(−0.492,+1.276)	0.384	+0.353	(−0.574,+1.280)	0.455
	Diploma	+0.310	(−0.664,+1.285)	0.532	+0.364	(−0.660,+1.389)	0.485
	University or higher	+0.427	(−0.472,+1.326)	0.351	+0.457	(−0.484,+1.398)	0.341
Income band	Low	Reference level			Reference level		
	Middle	+0.030	(−0.645,+0.704)	0.930	+0.023	(−0.657,+0.703)	0.947
	High	+1.032	(+0.329,+1.736)	0.004 **	+1.193	(+0.450,+1.937)	0.002 **
First language	English	Reference level			Reference level		
	Other language	+0.967	(+0.021,+1.913)	0.045 *	+0.920	(−0.073,+1.913)	0.069
Aboriginal status	No	Reference level			Reference level		
	Yes	−0.268	(−1.601,+1.065)	0.693	−0.164	(−1.577,+1.250)	0.820

CI, confidence interval; Statically significant value of ps: *$p < 0.05$, **$p < 0.01$.

language (ß = 0.967, $p < 0.05$, 95% CI (0.021,+1.913)) showed significant influences in the imputed data. In particular, boys, children from high-income families and children whose first language is not English, received higher number concepts scores after their teachers participated in PD intervention.

Early numeracy scale scores

As shown in Table 8, gender, income band, first language and aboriginal status did not influence the comparisons between the control and intervention groups regarding children's number concepts. However, group (ß = 0.035, $p < 0.05$, 95% CI (0.008, 0.061)), age (ß = 0.271, $p < 0.05$, 95% CI (0.031, 0.510)) and mother's education (ß = −0.041, $p < 0.05$, 95% CI (−0.078, −0.004)) showed significant influences in the imputed data. In particular, children from the control group, younger children and children whose mothers had university or higher education tended to receive lower early numeracy scores in the PD programme.

Verbal comprehension scores

As shown in Table 9, age, gender, mother's education, income band, first language and aboriginal status did not influence the comparisons between the control and intervention groups regarding children's Verbal Comprehension.

Expressive vocabulary scores

As shown in Table 10, age, gender, mother's education, income band, first language and aboriginal status did not influence the comparisons between the control and intervention groups regarding children's Verbal Comprehension.

Discussion

Following the theory behind RCTs, and hence assuming that control and intervention groups are equivalent because of randomisation, uncontrolled comparisons should suffice for testing the effect of the intervention. In terms of pedagogical quality, the results from the regression analysis indicated that *Leadership for Learning* PD showed significant effects on the total average and subscale scores of SSTEW and ECERS-E, the latter was also part of the PD. In terms of child development, in simple uncontrolled comparisons between control and intervention group children, there were significantly greater improvements in the intervention group for the change between pre-and post-test for the outcomes DAS Early Number Concepts, DAS Verbal Comprehension and Preschool Early Numeracy Scale. However, in the mixed-effect linear regression model, only the Preschool Early Numeracy showed a significant difference indicating greater improvement for the intervention group. Meanwhile, children's age, gender, family income, first language and mother's education significantly influence the PD impacts on children's number concept and numeracy development. These findings are discussed in this section.

The impacts of the professional development programme on pedagogical quality

The current research identified that the *Leadership for Learning* PD had effects on the curricular and interactional quality

TABLE 8 Results of regression model of difference between pre-and post-intervention Preschool Early Numeracy Scale scores; models fitted to multiply imputed data (*N*=1,129) and to complete cases only (*N*=958).

		Imputed data			Complete cases		
		Beta	95% CI	Value of p	Beta	95% CI	Value of p
Group	Control		Reference level			Reference level	
	Intervention	+0.035	(+0.008,+0.061)	0.011 *	+0.045	(+0.017,+0.073)	0.002 **
Age difference		+0.271	(+0.031,+0.510)	0.027 *	+0.266	(+0.009,+0.523)	0.042 *
Sex	Male		Reference level			Reference level	
	Female	−0.009	(−0.029,+0.011)	0.397	−0.011	(−0.033,+0.010)	0.303
Mother's education	Less than high school		Reference level			Reference level	
	High school	−0.016	(−0.053,+0.020)	0.385	−0.016	(−0.055,+0.022)	0.406
	Diploma	−0.027	(−0.067,+0.014)	0.203	−0.028	(−0.071,+0.015)	0.206
	University or higher	−0.041	(−0.078,-0.004)	0.032 *	−0.038	(−0.077,+0.001)	0.059
Income band	Low		Reference level			Reference level	
	Middle	−0.009	(−0.038,+0.020)	0.554	−0.006	(−0.034,+0.022)	0.680
	High	−0.016	(−0.046,+0.015)	0.306	−0.014	(−0.046,+0.017)	0.359
First language	English		Reference level			Reference level	
	Other language	−0.011	(−0.050,+0.029)	0.602	−0.013	(−0.055,+0.029)	0.535
Aboriginal status	No		Reference level			Reference level	
	Yes	+0.012	(−0.044,+0.067)	0.676	+0.023	(−0.036,+0.082)	0.451

CI, confidence interval; Statically significant value of ps: *$p < 0.05$, **$p < 0.01$.

TABLE 9 Results of the regression model of difference between pre-and post-intervention DAS verbal comprehension scores; models fitted to multiply imputed data (*N*=1,130) and to complete cases only (*N*=960).

		Imputed data			Complete cases		
		Beta	95% CI	Value of p	Beta	95% CI	Value of p
Group	Control		Reference level			Reference level	
	Intervention	+0.673	(−0.113,+1.460)	0.092	+0.618	(−0.241,+1.477)	0.156
Age difference		+1.483	(−5.585,+8.551)	0.681	+2.279	(−5.500,+10.058)	0.565
Sex	Male		Reference level			Reference level	
	Female	−0.329	(−0.919,+0.261)	0.274	−0.535	(−1.172,+0.103)	0.100
Mother's education	Less than high school		Reference level			Reference level	
	High school	+0.274	(−0.800,+1.349)	0.616	+0.149	(−0.985,+1.283)	0.797
	Diploma	−0.392	(−1.572,+0.788)	0.515	−0.541	(−1.795,+0.712)	0.397
	University/ higher	+0.076	(−1.022,+1.173)	0.893	+0.132	(−1.019,+1.283)	0.822
Income band	Low		Reference level			Reference level	
	Middle	−0.452	(−1.258,+0.354)	0.272	−0.463	(−1.296,+0.370)	0.276
	High	−0.848	(−1.704,+0.009)	0.052	−0.891	(−1.802,+0.020)	0.055
First language	English		Reference level			Reference level	
	Other language	+0.345	(−0.829,+1.518)	0.565	+0.452	(−0.777,+1.681)	0.471
Aboriginal status	No		Reference level			Reference level	
	Yes	−0.361	(−2.002,+1.279)	0.666	−0.328	(−2.061,+1.404)	0.710

CI, confidence interval.

measured by ECERS-E and SSTEW. The average improvement for ECERS-E and SSTEW were 0.86 and 0.90 on seven-point scales. This result aligns with recent meta-analyses, indicating that in-service PD programmes could promote classroom quality and teacher-child interaction (Egert et al., 2018), especially when staff can use them for self-assessment, planning and improvement too.

TABLE 10 Results of the regression model of difference between pre-and post-intervention EYT expressive vocabulary scores; models fitted to multiply imputed data (*N*=1,118) and to complete cases only (*N*=945).

		Imputed data			Complete cases		
		Beta	95% CI	Value of *p*	Beta	95% CI	Value of *p*
Group	Control		Reference level			Reference level	
	Intervention	+0.099	(−0.499,+0.697)	0.743	+0.064	(−0.595,+0.723)	0.847
Age difference		+4.856	(−0.477,+10.189)	0.074	+3.490	(−2.440,+9.420)	0.248
Sex	Male		Reference level			Reference level	
	Female	+0.068	(−0.370,+0.506)	0.760	+0.166	(−0.315,+0.646)	0.499
Mother's education	Less than high school		Reference level			Reference level	
	High school	−0.062	(−0.894,+0.769)	0.883	−0.250	(−1.108,+0.609)	0.568
	Diploma	−0.681	(−1.580,+0.217)	0.137	−0.699	(−1.643,+0.245)	0.146
	University or higher	−0.088	(−0.928,+0.753)	0.838	−0.227	(−1.097,+0.643)	0.609
Income band	Low		Reference level			Reference level	
	Middle	+0.405	(−0.215,+1.025)	0.200	+0.493	(−0.134,+1.119)	0.123
	High	−0.236	(−0.897,+0.426)	0.484	−0.235	(−0.921,+0.451)	0.502
First language	English		Reference level			Reference level	
	Other language	+0.057	(−0.822,+0.937)	0.898	−0.148	(−1.079,+0.782)	0.754
Aboriginal status	No		Reference level			Reference level	
	Yes	+0.229	(−1.015,+1.473)	0.718	+0.479	(−0.853,+1.812)	0.480

CI, confidence interval.

The components of this PD programme could explain the significant effects. Regarding the "what" component of the *Leadership for Learning* PD, our results suggest that integrating relational and intentional pedagogy in a child-development-oriented approach effectively improves teachers' pedagogical practice. More specifically, as previously stated, the PD content involves pedagogical knowledge and strategies to foster relational and intentional educators. Meanwhile, these are not general pedagogical knowledge or strategies but have been tailored to children's cognitive and social–emotional development in different PD sessions, such as literacy, mathematical and scientific concept development and self-regulation. This is, to some extent, consistent with previous research, which identified training teaching strategies according to the discipline-specific curriculum (Buysse et al., 2009; Darling-Hammond et al., 2017). Meanwhile, the *Leadership for Learning* PD also extends this statement by replacing discipline-specific content with a child-development-oriented approach as the interdisciplinary curriculum is advocated in preschools to help children gain a more holistic approach to knowledge (Jacobs, 1989; Hall and Pais, 2021). Therefore, the PD content contributes to the discussions on PD design for preschools or contexts without discipline-specific curricula.

Regarding the "how" component of the *Leadership for Learning* PD. The *Leadership for Learning* PD employed face-to-face training, on-site modelling, providing DVD exemplars and reading materials, and phased process evaluations (Siraj et al., 2018). For one thing, the results imply that focusing on practice in the PD through modelling and providing exemplars is a critical element of effective PD. Especially for PD programmes focusing on pedagogical practice, modelling and

exemplars can help teachers positively implement higher quality teacher-child interactions. In line with this, evidence reviewed in previous research also suggests that teachers' practice is more important than PD duration, as PD duration is not necessarily associated with teachers' practice (Sims and Fletcher-Wood, 2021). This research extends the discourse on effective PD by employing new elements—using quality rating scales and phased process evaluation by teachers themselves. Specifically, teachers learned about elements of the quality ratings of classroom quality and were invited to evaluate the PD provision and their learning process after each phase of PD. Using scales as tools to improve quality has increasingly been applied to research and practice and led to quantifiable improvements in ECEC by democratising the use of these scales by teachers to support their own pedagogical leadership practice (Mathers et al., 2007). The current study integrated this approach into the Leadership for Learning PD and demonstrated its effectiveness. Supporting teachers' independent use of self-rating using items from the scales supported their practice-uplift. They also evaluated the PD process and provided feedback that informed the follow-up PD design. These approaches support the self-directed learning theory for adult learners, which indicates that adults have a high level of ownership over their own learning, such as self-assessment, setting their learning goals and choosing learning activities (Lohman and Woolf, 2001). Therefore, adapting PD programmes towards teachers' needs and interests might also increase PD effectiveness in this research.

Regarding the "who" component of the *Leadership for Learning* PD. The PD emphasises the Australian ECEC context and maximises the coherence of PD content with the governmental

regulations and national standards of quality ECEC in Australia. The critical role of coherence in designing effective PD programmes has also been emphasised by Desimone (2009), who argues that PD "should be aligned with state and district goals" (p. 184). Our results provided empirical evidence for this statement by examining the effectiveness of a context-fit PD programme. This is especially important for pedagogical practice since different social cultures and contexts have different expectations of teachers' behaviours (Desimone, 2009). In addition to the context, as aforementioned, teachers' feedback also informed this PD design. In this regard, teachers are active participants rather than merely passive recipients in this PD programme, thus enabling the match between the PD receivers' needs and PD provision (Louws et al., 2017). The PD was also modified prior to delivery given the pre-intervention results of the ECERS E and SSTEW, ascertaining where weaknesses existed in staff knowledge and pedagogical approaches.

The impacts of the professional development programme on child development

RCTs ensure control and intervention groups are equivalent because of randomisation (Torgerson and Torgerson, 2012). Therefore, uncontrolled comparisons should suffice for testing the effect of the intervention, which indicated that there were significantly greater improvements in the intervention group regarding DAS Early Number Concepts, DAS Verbal Comprehension and Preschool Early Numeracy Scale. These results are in line with previous research, indicating that evidence-based in-service professional development could promote children's language and numeracy development (e.g., Fukkink and Lont, 2007; Markussen-Brown et al., 2017; Egert et al., 2018; Kraft et al., 2018) and that quality pedagogical practice is associated with child development (e.g., Sylva et al., 2006; Werner et al., 2015; McCoy and Wolf, 2018).

Furthermore, mixed-effect linear regression models controlling for clustering and all demographics, including age were used to look for differences in change in outcomes between the control and intervention groups. In these analyses, only the Preschool Early Numeracy showed a significant difference indicating greater improvement for the intervention group. However, the analyses of all the other child outcomes indicated a greater improvement in the intervention group that did not reach statistical significance. For one thing, given that ECERS-E mathematics showed the most dramatic improvement than other subscales, the significant Preschool Early Numeracy scores might be related to the biggest changes in ECERS-E mathematics. Pianta et al. (2021) also observed that teachers performed better improvements in instructional interactions if they had more engagement in coaching feedback. Meanwhile, more gains predicted greater increases in child development. This research and Pianta et al. (2021) finding suggests there might be a threshold

between teachers' amount of pedagogical improvement and facilitating child development, thus requiring future research.

Also, there was some drop-out of centres from the intervention group after randomisation. While the comparisons of demographics indicate no significant differences between the groups, it might still be possible that some differences may exist. Therefore, the study further explored the influencing factors of the PD impacts on child development by analysing the covariates. The findings are discussed in the following section.

The influencing factors of professional development impacts on child development

In terms of the Early Number Concepts, children's gender, family income and first language are significant covariates. First, it was noticeable that the difference between pre-and post-intervention scores was significantly smaller for girls than boys. This may represent a degree of "catch up" in boys' scores over time. Previous research indicated that teacher-child interactions are gendered, and boys tend to receive more negative feedback from teachers than girls, thus influencing their development (Beaman et al., 2006). In this regard, PD programmes, which have been demonstrated to be effective in changing teachers' response patterns to boys and girls (Consuegra and Engels, 2016), might explain boys' better gains than girls.

Second, the difference between pre-and post-intervention DAS Early Number Concepts scores was significantly larger for children from high-income families, as compared to the low-income reference group. Although the PD intervention has been demonstrated a buffering role in child development from disadvantaged backgrounds, the development gap could still exist if higher-income children's teachers also receive training. The result is supported by a recent large-scale longitudinal research indicating that wealth is associated with children's academic and behavioural development (Miller et al., 2021). Third, children whose first language was not English had a significantly larger difference between pre-and post-intervention DAS Early Number Concepts scores than children whose first language was English. However, this effect was significant in the multiply imputed data model only, and it is prudent to place greater confidence in results supported by both analyses of imputed and complete cases data.

In terms of Preschool Early Numeracy Scale scores, there was a significantly larger improvement between pre-and post-intervention Preschool Early Numeracy Scale scores in the intervention group as compared to the control group, and this difference was larger where the age gap pre-to post-intervention was larger. This might reflect the longer exposure time of children to intervention-trained staff. Additionally, the difference between pre-and post-intervention Preschool Early Numeracy Scale scores was significantly smaller for children whose mothers were educated at university or higher level as compared to children whose mothers had educational attainment of "less than high

school." This may represent a degree of "catch up" over time in the scores of the children of lower qualified mothers. Although mothers' education provides a foundation that supports children's academic success (Davis-Kean et al., 2021), the results of this study contribute to current research on parental education by showing that providing PD programmes for teachers could partially compensate for the negative influence on child development from the relatively lower levels of mothers' education.

In terms of DAS Verbal Comprehension and the EYT Expressive Vocabulary, there were no statistically significant effects in the regression models for their outcomes. Our result suggests that the covariates of PD programmes might have different mechanisms of influencing mathematics and language development. Chow and Ekholm (2019) also identified that vocabulary did not significantly predict mathematics. Therefore, some covariates which are significantly related to child numeracy might not be associated with child language.

The discussion has focused mainly on teacher quality and child cognitive outcomes. There were expected improvements in children's socio-behavioural and self-regulation outcomes from pre-to post-test in the control group for children in routine ECEC practice. By contrast, children in the intervention group showed an additional improvement over the same period, but only for internalising problems. The intervention did not appear to produce an added benefit for children in the intervention group in relation to externalising problems, prosocial behaviours and self-regulation (for further insight please see the technical report, Siraj et al., 2018).

Conclusion

This study examines the effects of an evidence-informed PD, the *Leadership for Learning* training which contains curricula content, process quality and child-development workshops. The PD was predicated on 4 important principles: (1) Reviewing the extant literature and meta-analyses of "what works" in PD eg best duration, specific knowledge of child development as well as content, delivery and modes of presentation, (2) use of pre-assessment quality rating scales data from the study to identify specific training needs, (3) use of the scales as tools for the teachers to support their learning and practice, alongside workshop and supporting materials, and (4) supporting staff by using their feedback through questionnaires alongside online ongoing support with access to all materials and a platform for a community of learners.

The results indicated that *Leadership for Learning* PD significantly affected pedagogical quality, with the intervention group receiving higher scores of SSTEW and ECERS-E as expected, given their use as assessment and support. In terms of child development, children in the intervention group also showed significantly greater improvements in socio-emotional, numeracy and language skills measured by DAS Early Number Concepts, DAS Verbal Comprehension and Preschool Early Numeracy Scale.

Children's age, gender, family income, first language and mother's education significantly influence the PD impacts on children's number concept and numeracy development. Within a fragmented system of ECEC with variable training of the workforce, expanding access to ECEC and improving quality by providing effective PD can promote children's outcomes and may contribute to school readiness for this age group.

Future research on PD intervention could consider the following areas. Firstly, the participants of the current study were from Australia, thus warranting caution in terms of generalising the research findings to other contexts. Given that teachers in different contexts show variability in pedagogical practice and PD needs, PD adaptation is required when conducting the Leadership for Learning PD in other contexts. Secondly, this research focused on classroom quality and child development and did not collect data on the home learning environment and teachers' characteristics that also impact child development. Future research could control the home learning environment and teachers' beliefs, self-efficacy and leadership as covariates when exploring the PD effects.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by the University of Wollongong Ethics Committee, NSW, Australia. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

IS, EM, DK, SH, and CN-H contributed to conception and design of the study. IS and SH wrote the first draft of the manuscript. EM, SH, IS, and JG analysed the data. MD, DK, CN-H, RH, and BL read and edited sections of the manuscript. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Promoting culturally informed and sensitive practice in day-care centers—a contribution to the professionalization of day-care teachers

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Background: Based on the growing number of families and young children with a refugee background in Germany, day-care teachers face enormous challenges regarding culturally informed practice. The project "Gemeinsam stark durch den Start" (Stronger together by starting together) addresses these challenges on various levels. At the level of day-care teachers, training in culturally informed and sensitive education is combined with reflection sessions about their own attitudes and prevailing intercultural norms, thus contributing to the professionalization of day-care teachers.

Aim: This paper focuses on mechanisms of action that contributed to the effectiveness of the training from two perspectives: the day-care teachers' perspective and the trainers' perspective.

Methods: Staff members of 11 German day-care centers underwent graded online training sessions (team and in-depths trainings) addressing intercultural topics. All participants were presented with a questionnaire for their training evaluation before and after the training sessions. Also, participants of the in-depths trainings participated in semi-structured interviews on the training. Furthermore, qualitative interviews were conducted with all trainers ($N = 4$) of the workshops.

Results: Day-care teachers evaluated the online training positively, especially the improvement of professionalization and the implementation of training elements. Results reveal that (work-related) reflexive sessions as well as sessions dealing with the implementation of exercise tools into daily practice were rated as fundamental parts in the training. Teachers from high-risk day-care centers estimated the trainings' effectiveness lower than those working in low-risk day-care centers. Qualitative data shows that the day-care teachers are in need of (theoretical) knowledge about all training elements and hands-on advice for dealing with specific situations. Especially day-care teachers within a high-risk environment, who already report having an elevated level of intercultural knowledge and skills, may need a higher dose training while low-risk day-care teachers may profit more from a low threshold training.

Conclusion: The introduced training sessions focusing on intercultural sensitivity and competence present an important contribution to the professionalization of day-care teachers in working with children from different cultural backgrounds. Trainings should focus on reflexive elements as well as exercises in perspective taking and provide hands on materials for daily work.

1. Introduction

In spite of Germanys consolidated status as an immigration country, social institutions are still not sufficiently prepared for people with a migration background, especially those with a displacement or refugee experience. In the past years, a number of crises such as the war in Syria or the ongoing war in Ukraine have led to a rise in numbers of families with young children with a refugee background. A substantial number of refugees experience traumatizing events before or during their flight. These can be particularly severe for children and may have a negative impact on their development including school achievement (Hasselhorn et al., 2014), as well as causing physical and psychological impairments (Fingerle and Wink, 2020). Furthermore, families face challenges such as learning to navigate new surroundings and authorities as well as learning a new language and culture. Regarding aversive health effects, research for a long time focused on pre-migration traumata that might result in health problems after resettlement in new host societies (Chantler, 2012). Only recently a shift in attention took place where scientists more strongly investigated post-migration risk factors for refugees. Studies from the United Kingdom for example have shown that refugees face economic and social stressors in their host countries, such as unemployment, poverty, uncertainty about residency, social isolation, inadequate housing, discrimination, and language difficulties (see James et al., 2019). Therefore, it is important to include a discussion of post-migration risk factors as structural factors that might mitigate efforts to implement intercultural sensitivity in early childhood education (ECE).

Regarding integration into new host societies, one has to consider differences in norms and values that prevail in families shaped by original cultural backgrounds which might at least partially promote or hinder the acculturation process (van der Zee and van Oudenhoven, 2022). Although beyond the scope of this paper, it should be mentioned that concepts of intercultural education and intercultural sensitivity should consider the challenges and contradictions of multicultural contexts related to the ongoing debate about cultural relativism versus universalism (Schilmöller, 2009).

Regardless of the reason for migration, it leads to changes in social and family networks and it is linked to various social topics such as the integration of children with a refugee background into the German educational system (Geisen et al., 2014). Especially for young children it is important to establish a safe environment to promote an appropriate cognitive and social–emotional development (Britto et al., 2017). With regard to the aforementioned risk factors, it is important to provide a culturally informed professional environment in early institutional care to support children in families who often struggle with a number of adjustments to the new host society (Belhadj Kouider et al., 2014).

Hence, teachers in early institutional day-care experience issues of establishing innovative and culturally informed practices to create the premises for needs-oriented integration. This requires a high level

of professionalism (Haslip and Gullo, 2018). Professional practice is characterized by the amalgamation of scientific and practical knowledge and allows professionals to develop new and appropriate approaches and actions (Dewe and Otto, 2015). Furthermore, difficult situations require negotiation and actions skills and the ability to self-reflect when processing highly complex tasks (Müller, 2012). Despite the ongoing trend toward higher education of day-care teachers in Germany, most of them still have completed a vocational training exclusively. That means they have graduated from a school for social pedagogy. This training is more practically oriented than academically informed (Wadepohl, 2019). Daily requirements when working with children in day-care centers demand a high level of competency that includes special knowledge and skills. Acknowledging the importance of practical skills, education for day-care teachers also has to integrate current research and science-based knowledge to promote further professionalization (Wolf, 2015). Trainings for day-care teachers in general should foster competencies that allow them to face present challenges, to solve problems and to implement innovative practice at day-care centers (Fröhlich-Gildhoff et al., 2011). Considering the aforementioned increase in children with refugee experiences, educational practice needs to be not only innovative but also culturally informed. For this reason, the project *Gemeinsam stark durch den Start* (*Stronger together by starting together*) developed a theory-based online training for day-care teachers facing culturally sensitive and informed education as well as an easy-to-apply toolbox to promote intercultural social–emotional learning of all children in day-care centers.

1.1. Intercultural sensitivity and intercultural competence

Day-care teachers repeatedly and increasingly act in intercultural overlapping situations with people from different cultural backgrounds and they must be equipped to navigate these challenging situations safely. To do so, they need intercultural competence that enables them to grasp and productively use cultural conditions and that helps them to control influencing factors in their perceptions, judgments, thinking and emotions as well as in their actions (Thomas, 2009; Deardorff and Jones, 2012). Intercultural sensitivity is also relevant in the interaction with children and their families: Without awareness of differences between different cultures, successful intercultural communication and interaction cannot occur (Chen and Starosta, 2000). A high level of intercultural sensitivity is expressed by a deep attitude of ethnorelativism and the ability to think beyond one's own cultural background. It also includes the ability to consider differences as processes and to adapt adequately in intercultural settings (Chen and Starosta, 2000).

Within the field of intercultural education an ongoing debate addresses the issue if compensatory educational efforts for children with a migration or refugee background promote the acculturation

process (Möller, 2012). These compensatory efforts that often focus on the training of language skills and the associated deficit view, are still prominent in educational settings (Åkerblom and Harju, 2019). However, more innovative concepts highlight the problems such as the corroboration of cultural hegemonism and nationalist perspectives inherent in such compensatory and deficit-oriented approaches (Catarci, 2014; Åkerblom and Harju, 2019). Therefore, the present project tried to avoid such elements and did not focus on language skills but instead was based on intercultural reflection and the exchange of intercultural understanding, ideas and practices.

A number of studies have dealt with the promotion of intercultural competence in educational institutions and a recent systematic review has summarized results regarding variables that might influence intercultural competence (Bagwe and Haskollar, 2020). Bagwe and Haskollar (2020) distinguished between intercultural program characteristics and individual or demographic characteristics. Intercultural programs in general should combine self-reflection with training elements and implement different workshop elements like learning reflections, peer support or intercultural interaction for students and professionals. Regarding individual and demographic characteristics experiences of living and working abroad proved to be the most effective way of promoting intercultural competence. Although acknowledging the importance of demographic variables for the development of intercultural competence, the authors conclude that the impact of demographic background must be judged based on the individual case (Bagwe and Haskollar, 2020).

In addition, a recent review investigated efforts to promote intercultural competences in in-service and pre-service teachers (Romijn et al., 2021). The review is based on a general concept of professional development (PD) that integrates the role of individual differences of learners (who), target skills and knowledge of the PD (what), and the strategies used to promote PD, e.g., workshops and implementation of curriculums, into an overall model of PD. The model identifies reflection and corresponding enactment as the basic mechanisms underlying successful PD in teachers. Regarding the promotion of intercultural competence, this review identifies three main elements that might enhance PD in the field of intercultural competence (Romijn et al., 2021): First, the authors highlight the role of context and recommend a team-based strategy with single teachers functioning as counselors in an environment that provides appropriate classroom materials and is supported by a culturally responsible policy. Second, the authors emphasize the importance of targeting teachers´ belief systems and to stimulate reflecting own cultural biases and own ways of interculturally responsive teaching practices. Third, the authors stress the complex relation between beliefs and actions, and conclude based on their findings that sustainable enactment of culturally sensitive teaching practices is still neglected in intervention and evaluation.

1.2. Social−emotional learning in intercultural settings

For the professionalization of day-care teachers, intercultural competence and intercultural sensitivity should be linked with knowledge of developmental psychology and developmentally oriented prevention (Scheithauer et al., 2022). Especially children at younger age who are exposed to multiple risks like low social-economical status, poor familiar support and migration background show less social and emotional competencies (Hölling et al., 2008). However, professional support in day-care centers might compensate for some of those risks (Anders, 2013) and might foster children's social–emotional learning (SEL). The concept of SEL includes five basic areas of skills, namely self-awareness, self-management, social awareness, relationship skills, and responsible decision-making (CASEL, 2013). To promote the positive development of interaction and communication between children in culturally diverse settings, SEL has to be integrated with intercultural knowledge and intercultural contact (Hess et al., 2021). Finally, an effective training to increase professionalization of day-care teachers should include measures to foster intercultural sensitivity in teachers as well as to provide and to train easy-to-apply tools to promote interculturally informed SEL in young children (Romijn et al., 2021).

1.3. Teaching intercultural competence for day-care teachers

The first step in developing the intercultural training for day-care teachers was an extensive literature review on intercultural competence in connection with (culturally sensitive) pedagogy as well as a needs analysis based on qualitative interviews with four day-care teachers. A combination of both elements resulted in a theory-driven basic approach, a methodological framework and a didactic-content structure.

The *basic approach* is grounded on the concept of prejudice-conscious education (Preissing and Wagner, 2003) which represents an adapted German version of the "Anti-Bias Approach" (Derman-Sparks and A.B.C. Task Force, 1989). This approach pursues four goals: (1) enable children to develop a self-confident identity, (2) experience diversity and build empathy, (3) stimulate critical thinking about prejudice and discrimination, and (4) work together and actively against discriminatory behavior. This means to also critically question one's own professional actions and their effects and to commit oneself to justice and to resist injustice (Wagner, 2009). In doing so, day-care teachers also serve as important role models for children (Wagner, 2009). The anti-bias approach was chosen for several reasons. First of all, the anti-bias curriculum has a long history and is well established in early childhood education (ECE). Second, the approach provides a strong foundation in developmental theories, namely the works of Vygotsky (1978, cited from Davidson and Fouts, 2022) who emphasized the role of social interaction in development, and Rogoff (1990, cited from Davidson and Fouts, 2022) who adopted the core assumptions of Vygotsky to apply them to intercultural contexts. Finally, the anti-bias approach and its core components are linked closely to the requirements for a developmentally appropriate practice in early childhood (Sanders and Farago, 2018; Beneke et al., 2019).

The *methodological framework* is based on a general understanding of competence which is defined as a disposition that enables persons to cope with concrete demands of a certain kind (Klieme et al., 2003). In this case, the specific demand is to cope with the challenges of dealing with refugee children in an intercultural day-care setting. Competence is also expressed in performance, i.e., actual performance in complex situations (ISB - Staatsinstitut für Schulqualität und Bildungsforschung München, 2006). In day-care

FIGURE 1
Competence model according to Fröhlich-Gildhoff et al. (2011).
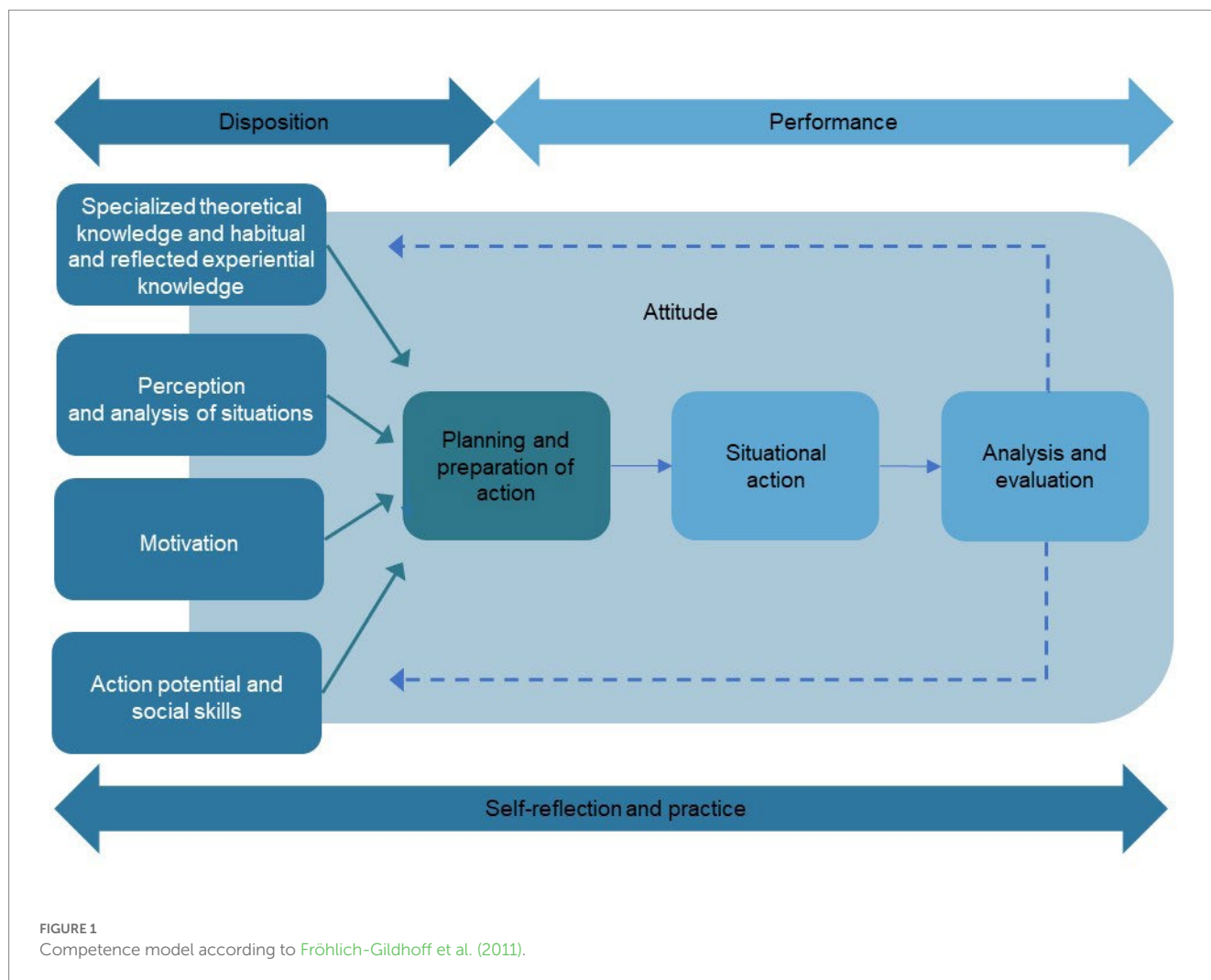
centers, (intercultural) interaction situations cannot be standardized, they are complex and difficult to predict (Fröhlich-Gildhoff et al., 2011). Training measures should therefore build up competences which, based on (scientific-theoretical) knowledge and reflected experiential knowledge, enable professionals to accept current demands, to solve problems and to shape new and adaptive educational settings in an intercultural context (Fröhlich-Gildhoff et al., 2011; see Figure 1).

The *didactic-content structure* focuses on the working environment of day-care teachers and is structured according to the methodological dimensions of knowledge, attitude, and action. What we know from intercultural trainings in other areas is that a stepwise approach proved to be most successful. In a stepwise approach, basic and more general subgoals must be accomplished before the training addresses more complex or specific subgoals that aim at advanced intercultural competencies. For example, Bennett (1986) reasons that cognitive and emotional perspective-taking comes first (knowledge) so that on this basis empathy can be promoted, which in turn represents the basis for changes in attitude toward cultural diversity (attitude). This can be followed by changes in (planning of) actions in intercultural settings. In the process of developing the present training, contents were derived from the literature review and the needs analysis mentioned above. In the training, each content block is given sufficient time for reflection and practice. The content of the training is

summarized in Table 1 along with the dimensions of the methodological framework.

1.4. Research questions

Based on the theoretical background described above, we assume that the training planned in this way will have a positive effect on the three competence areas of knowledge, attitude and action according to Bennett (1986) in day-care teachers and therefore enables them to handle intercultural situations in day-care centers in a professional way. Moreover, we assume that the day-care teachers are then capable of passing these competencies to children, depending on risk-factors in the environment. More specifically, ratings of day-care teachers about environmental risk-factors are thought to be related to ratings of successful intercultural education and professionalization in intercultural competence.

In a mixed methods design, we aim to answer the following research questions:

1. How is the training rated by workshop participants regarding content and benefit for their everyday practice? How does the training advance professionalisation based on ratings from participants? As the training is designed in a stepwise approach as recommended by Bennett (1986), we expect that workshop participants evaluate the training favorably regarding content and benefit for their own work.

TABLE 1 Structure and objectives of the team training and the in-depths training.

Contents	Methodical dimension according to the competence model
Team training	
1. Inequality/discrimination in society • Knowledge transfer on and sensitization for unequal treatment based on social status, gender, origin and skin color • Verbalization of accompanying feelings and reflection in the group • Raising awareness of one's own social identity and reflection on identity attributes that can lead to preferential treatment or discrimination • Emotional perspective-taking of disadvantaged persons and their limitations • Knowledge transfer on critical whiteness and privileges of insiders	• Attitudes (openness, curiosity, tolerance of ambiguity) • Knowledge (theorical and reflective knowledge)
2. Inequality/discrimination in childhood • Emotional perspective-taking of disadvantaged children • Raising awareness of mechanisms of inequality that influence how children think, feel, and act	• Attitude (openness, curiosity, tolerance of ambiguity) • Reflective knowledge
3. My own power positions • Reflection of influence and power on child and parent level • Developing an awareness to deal sensitively with one's own power position and to be able to act as a role model	• Attitude (respect, openness, tolerance of ambiguity) • Reflective knowledge
4. Our common mission • Developing common values and guiding principles that are condensed into a mission (accompanied by the day-care center management) • Building common commitment	• Attitude (respect, openness, curiosity) • Action planning
In-depths Training	
1. Degradation and discrimination in the everyday life of children • Reading reports from children who experienced discrimination and racism • Verbalization of own accompanying feelings while reading • Reflecting on own "take-home" message from the reading-task • Emotional perspective-taking of the children and verbalizing their possible feelings and implications • Reflection in the group of what the children would have needed from an adult in these situations	• Theoretical and reflective knowledge • Attitude (openness, curiosity)
2. Dealing with degradation and discrimination • Raising awareness of the importance of active action against exclusion • Reflection on one's own role dealing with degradation and discrimination • Raising awareness of one's own possibilities to intervene in cases of discrimination • Development of a power-critical and exclusion-critical position and ability to verbalize this position	• Knowledge (theoretical and reflective) • Attitude (openness, curiosity)
3. Knowledge about early childhood developmental processes • Knowledge acquisition of tolerance development and early childhood developmental processed related to prejudice development • Knowledge acquisition of preventive strategies against the development of prejudice and for promotion of tolerance development • Raising the ability to link the knowledge with the goals and contents of the project	• Theoretical and reflective knowledge
4. Consideration of own imprints • Reflection of own experiences with stereotypes and imprints for example in children's books or series from own childhood • Reflection on unequal treatment, discrimination, sensitivity in dealing with POC in one's own institution • Planning of concrete implementation steps of what has been learned	• Knowledge (theoretical and reflective) • Attitude (openness, curiosity, tolerance of ambiguity) • Action planning
5. Reflection and knowledge about the building blocks of the toolbox • Presentation of the manuals with an example • Presentation of single components with exercises • Reflection on the (emotional) effects of the implementation on different children and awareness for the children's needs while implementing	• Action planning • Reflective knowledge • Attitude (openness, curiosity)

2. How does the training and the implementation of training elements into ECE practice have a positive effect on relevant child outcomes? We also expect participants to report positive expectations for outcome on children.

3. How does environmental risk status affect the ratings of participants regarding the effectiveness of the training? We expect that a higher risk status as well as a high level of migration background in the neighborhood predicts greater benefit from the training.

The study will also provide information on mechanisms of action that contributed to the effectiveness of the training from two perspectives: the day-care teachers' perspective and the trainers' perspective.

2. Materials and methods

The study was designed using a controlled waiting-list-method and was approved by the ethical board of the *DHGS Deutsche Hochschule für Gesundheit und Sport* (German University of Health and Sports). In the intervention group, day-care teachers of 11 German day-care centers with refugee children took part in graded training sessions (team trainings for day-care teachers and in-depth trainings for multipliers). Participants in the control group received a workshop after handing in all questionnaires. In this paper, we only present data based on the training sessions for the intervention group. Firstly, within a pre-post-design all participants were presented with a questionnaire for their training evaluation. Secondly, semi-structured interviews on the training were conducted with multipliers taking part in the in-depth trainings. Thirdly, qualitative interviews were conducted with all trainers ($N = 4$) of the workshops and in-depths trainings to identify which areas emerged as particularly critical or influential in relation to the professionalization of day-care teachers.

2.1. Participants

The initial sample recruitment started by contacting all day-care centers of private and public institutions located in the surrounding of large reception centers in the urban area of Hamburg and Augsburg, Germany. Due to the COVID-19 pandemic and the subsequent mandatory switch to a digital format, sample recruitment was expanded to cover the entire country. The project was then advertised online. Interested day-care centers were able to contact the project management independently. Inclusion criterion was the care of refugee or immigrant children between the ages of 3 and 6; exclusion criterion was if this was not the case.

A total of 11 day-care centers participated in the intervention group. Each day-care center sent staff to the team training sessions and up to two day-care teachers each to the in-depth training sessions. Furthermore, all day-care centers managers participated in a special training. However, this training did not focus on professionalization regarding intercultural sensitivity but rather addressed the role of day-care managers within the institutional setting in general. It should not be neglected that managers in general play a major role as providers of opportunities for professionalization within their teams (Fonsén et al., 2023). In this study, leadership training was not the main focus, therefore, this part of the training will not be included in the present analysis.

All an all, day-care centers in the intervention group had a total of around 180 employees. Between four and 17 professionals per day-care center took part in each of the training sessions ($M = 10.5$). Seven professionals participated in qualitative interviews. Demographic data from quantitative questionnaires independent of participation in the team workshops ($N = 87$) show that day-care teacher sample consisted of 76 (87%) female and 10 (12%) male professionals. One staff member indicated gender as "diverse/inter/other." The professionals age ranged between 18 and 60 years old ($M = 37$, $SD = 11.63$). 70% of all respondents reported own experiences of racism and exclusion. On average, the day-care teachers had been working at their current day-care center for about 7 years ($SD = 8.0$) and had been in charge of their current group of children for about

4 years ($SD = 4.8$). The school qualifications and occupational training of the participating staff is shown in Table 1.

All trainers ($N = 4$) have a background in either psychology or educational science and are experienced in adult education. Each workshop was given by two trainers, with one trainer taking the lead role.

2.2. Procedure

In order to examine the effects of the training programs, the evaluation questionnaire was presented within a pre-post-design. The team trainings for the day-care teachers were held between September 6th and October 28th 2021, the in-depth workshops from November 11th to 25th 2021. The day-care teachers were advised to fill out the questionnaire 2 weeks before the training started and as soon as possible after the training ended. If they did not respond within 1 week, they were contacted and reminded to do so in the next days. Data collection was terminated 4 weeks after the last training session. Data was collected through online surveys that were distributed to the day-care teachers via e-mail. The informed consent form and the questionnaires were completed in German by the participants. After all training sessions were finished, semi-structured online-interviews were conducted with in-depth multipliers to gain more profound knowledge about the training. Furthermore, qualitative data about the trainings sessions was derived from semi-structured online-interviews with the trainers of the workshops and in-depths trainings.

2.3. Instruments

2.3.1. Evaluation questionnaire

Risk status of day-care center environment was assessed using six items that were answered in a dichotomous fashion. The first question globally asked if there were any problems in the center environment (1 = yes, 2 = no). The remaining five questions dealt with the presence of different risk factors, namely lack of leisure activities, unemployment, drug abuse, high rate of delinquency, high level of environmental neglect. Each item was rated dichotomously (1 = not present, 2 = present). Items were summed up to build a cumulative risk factor, and each item was weighted equally. The risk index could therefore range from 5 (lowest risk) to 10 (highest risk). Due to the main topic of the workshops, we let the teachers rate if there were a lot of families with migration background in the environment of the day-care center.

On a quantitative basis day-care teachers provided direct assessments of the impact the workshop might have on their work after attending the workshop. Day-care center teachers in both conditions (team and in-depths) rated how valuable the workshop was for their day-to-day work. The evaluation included nine aspects of implementation of workshop content:

- Easy to apply elements
- Improvements of work satisfaction
- Improvements of social–emotional competence of children
- No change of child behavior
- Reduction of problematic child behavior
- Problems with non-German speaking children

- Biggest improvement of non-German speaking children
- No improvements of high-risk children
- Biggest improvements for high-risk children

Each of the items was rated on 5-point Likert scale ranging from 1 ("not at all true") to 5 ("completely true").

Moreover, the participants of the workshops rated their satisfaction with different elements of the workshop addressing the issue of professionalization. Teachers were asked to report their level of satisfaction with the following statements on a 5-point Likert Scale (from 1 = "very low" to 5 "very high").

- Level of informational content
- Level of relevance for every-day practice
- Level of benefit for own work

Regarding aspects of professionalization several additional items were included in the workshop evaluation. According to Bennett (1986) these items were categorized based on the dimensions of action, knowledge and attitude (in parentheses). Teachers were asked to report their level of agreement with the following statements on a 5-point Likert Scale (from 1 = "not at all true" to 5 "completely true").

- I have learned how to implement workshop topics in my day-care center. (action)
- I have refreshed my knowledge about the topic. (knowledge)
- I have extended my knowledge about the topic. (knowledge)
- The workshop taught knowledge about intercultural competence. (knowledge)
- The workshop stimulated self-reflection about my own cultural competence. (attitude)
- The workshop provided new perspectives on the topic. (attitude)

Ratings from teachers were analyzed in a descriptive way. In addition, ratings regarding the workshop evaluation were related to different levels of ratings of risk-status of environments to establish whether the workshops prove their efficacy equally well in different risk settings as reported by the day-care teachers.

2.3.2. Qualitative interviews with multipliers

The semi-structured interview concerning the in-depth training consisted of a series of questions regarding the training itself, the implementation of the toolbox and potential changes (at child level or day-care teacher level). At the end of each interview, participants had the opportunity to add their own comments and feedback. For the purpose of this study, only results regarding statements or changes due to the training are being reported. The in-depth interviews were conducted online and lasted an average of 20:57 min (12:21–28:29 min).

2.3.3. Qualitative interviews with trainers

The semi-structured interview for the trainers focused on the trainers' impression of the workshops and in-depths trainings. They were asked which elements of the training they thought worked well, whether there were differences between the training groups and whether there were difficulties and how they dealt with them, if any. The trainers' interviews were also conducted online and lasted on average 62:09 min (50:08–85:50 min).

2.4. Data analysis

Quantitative data was analyzed using SPSS version 28 (IBM, 2022). Descriptive data are reported. This was done to describe the overall satisfaction with the program addressing research questions one and two. In order to address research question three and to compute the relation between migration background and cumulative risk factors and different ratings Pearson correlations were used. In order to control for violations of assumptions related to the use of Pearson correlations a bootstrapping procedure was applied. Data were estimated based on 1,000 bootstrapping samples.

In addition to bivariate analysis several multiple regressions were conducted. This was done to learn more about the concurrent predictive value of different risk factors in the environment for workshop evaluation addressing research question three. Therefore, in a first set of regression analyses we used the single risk factors and not the cumulative risk as predictors and the different parameters of workshop evaluations as outcomes. In a second set we used the cumulative risk index and the migration background as predictors and workshop evaluation as outcomes. To reduce the number of outcome variables composite indicators were computed as means of the single indicators of each workshop evaluation topic if possible (implementation of training elements, improvement of professionalization, satisfaction with training elements). Improvements of professionalization were summarized according to areas suggested by Bennett (1986, see Methods section) To account for possible heteroscedasticity due to the nested data structure and considering the rather small sample size, robust standard error estimators were used.

For the analysis of qualitative data, all interviews were recorded and transcribed. The procedure for multipliers' interviews and trainers' interviews were the same, all interviews were worked through using qualitative content analysis and categorized using a derived code book.

3. Results

3.1. Quantitative analysis

Altogether, 105 persons took part in the pre-trainings or the post-training questionnaires. A total of 76 participants filled in the pre-training evaluation questionnaires, 65 participants provided ratings for the post-training questionnaires with 40 participants participating in both questionnaires. Regarding the additional in-depth-trainings, 16 from a total of 19 participants provided pre-and post-training data. The weak overlap between pre and post data resulted from the fact that the workshops were distributed over several days. Due to pandemic related issues, e.g., work overload and sick leave, participation in trainings sessions as well as response rates regarding evaluation questionnaires varied. Therefore, the overlap between pre-and post-data was rather low.

In a first step, descriptive parameters regarding the subjective individual ratings of at-risk status of the day-care center location were computed as a sum score for participants. These questions were asked in the questionnaire before the training took place. From these 76 participants, 33 (43%) expressed no special problems in their day-care center environment. The mean cumulative risk index (based on six items) was 7.54 (with a possible range from 6 to 12), with 51% of the

TABLE 2 Descriptive values of ratings regarding improvements in professionalization of day-care teachers attending the team-training and in-depth training.

Item	Type of training			
	Team (*n* = 65)		In-depth (*n* = 16)	
	M	SD	M	SD
Implementation of training elements				
Easy to apply elements	4.09	0.88	–	–
Improvements of work satisfaction	3.86	1.01	3.81	0.91
Improvements of child social-emotional competence	4.17	0.86	4.19	0.83
No change of child behavior	2.34	1.05	2.31	1.01
Reduction of problematic child behavior	2.81	1.21	3.00	1.10
Problems with non-German speaking children	2.85	1.02	2.87	1.15
Biggest improvement of non-German speaking children	3.65	0.94	3.50	0.89
No improvements of high-risk children	2.19	1.02	2.19	1.11
Biggest improvements for high-risk children	3.25	0.94	3.44	0.89
Improvement of professionalization				
Learned how to implement workshop topics in my day-care center (action)	3.78	0.99	4.00	0.97
I have refreshed my knowledge about the topic (knowledge)	4.00	1.02	4.00	0.85
I have extended my knowledge about the topic (knowledge)	3.91	1.20	4.13	0.74
Workshop taught knowledge about intercultural competence/ values regarding intercultural sensitivity (knowledge)	4.03	1.00	4.33	0.82
Workshop stimulated self-reflection about own cultural competence (attitude)	4.18	1.01	4.53	0.52
The workshop provided new perspectives on the topic (attitude)	3.83	1.21	4.27	0.80
Satisfaction with training elements				
Level of informational content	3.88	0.92	3.94	1.06
Level of relevance for every-day practice	3.84	1.05	3.38	1.41
Level of benefit for own work	3.94	1.03	3.87	1.20

Ratings range from 1 to 5.

teachers reporting no risk factor at all and 16% of the teachers reporting more than two risk factors within the environment of their day-care center.

The descriptive results from the post-training assessment are reported in Table 2.

The correlations between cumulative risk indexes, indicator of level of migration background within the day-care center environment and ratings of the workshop revealed the following results (see Table 3; in the table only significant correlations are shown).

Results reveal that high levels of migration background in the day-care center environment is related to lower levels of expected success in implementing the workshop content. The same pattern evolved regarding self-rating of improvements of professionalization and satisfaction with the trainings' content.

Likewise, higher ratings of risk status of the day-care center environment provided by day-care teachers were related to lower ratings of the chance of improvement for children as well as lower ratings of improvement regarding own professionalization. In addition, higher risk status was associated with lower satisfaction regarding the overall training contents and a lower expectation that the training will be effective for high-risk children.

Additional regression analyses with robust estimation of standard errors revealed that no single risk factor predicted ratings of implementation of training elements. However, using cumulative risk

and migration background as predictors results show that lower ratings of migration background predicted higher ratings of implementation success $b = -0.32$, $t(37) = -2.07$, $p = 0.045$. Almost the same pattern emerged regarding ratings of attitude change as one indicator of professionalization. Here in both regressions (single risk indicators vs. cumulative risk as predictors) higher ratings of a migration background environment predicted lower self-ratings of attitude change [$b = -0.99$, $t(35) = -3.13$, $p = 0.002$ and $b = -1.02$, $t(37) = -4.03$, $p < 0.001$]. Ratings of knowledge improvements were not predicted by any risk indicator. Lower ratings of improvements in action strategies based on workshop participation were predicted by higher rating of a migration environment when cumulative risk was used as a second predictor [$b = -0.79$, $t(37) = -2.25$, $p = 0.030$]. Overall satisfaction with workshop elements was equally and in the same direction as previous outcomes only predicted by the level of migration background in the environment [$b = -0.71$, $t(35) = -2.23$, $p = 0.032$ and $b = -0.70$, $t(37) = -2.59$, $p = 0.013$].

3.2. Qualitative analysis: interviews with in-depth multipliers

Analysis of the interviews with in-depth multipliers (M1-M7) resulted in a total of 12 categories. Most of the categories revolve

TABLE 3 Correlations between parameters of day-care center environment and ratings of the trainings' content and implementation (Pearson's r with bootstrapping).

Item	Migration background (no/yes)		Cumulative risk factor	
	r	95% CI	r	95% CI
Implementation of workshop elements				
Easy to apply elements	−0.28	[−0.55 −0.02]	−0.21	[−0.53 0.17]
Improvements of work satisfaction	−0.43**	[−0.61 −0.22]	−0.38*	[−0.70 −0.02]
Improvements of child social-emotional competence	−0.34*	[−0.56 −0.12]	−0.32*	[−0.60 0.00]
No change of child behavior	−0.10	[−0.42 0.31]	−0.25	[−0.10 0.57]
Reduction of problematic child behavior	−0.07	[−0.41 0.29]	−0.30	[−0.02 0.57]
Problems with non-German speaking children	−0.01	[−0.33 0.36]	−0.29	[0.03 0.52]
Biggest improvement of non-German speaking children	−0.19	[−0.52 0.16]	−0.05	[−0.31 0.33]
No improvements of high-risk children	−0.31	[−0.01 0.65]	−0.45**	[0.18 0.70]
Biggest improvements for high-risk children	−0.15	[−0.48 0.29]	−0.24	[−0.04 0.50]
Improvement of professionalization				
Learned how to implement workshop topics in my day-care center (action)	−0.19	[−0.47 0.14]	−0.00	[−0.35 0.36]
I have refreshed my knowledge about the topic (knowledge)	−0.14	[−0.36 0.13]	−0.07	[−0.47 0.27]
I have extended my knowledge about the topic (knowledge)	−0.39*	[−0.58 −0.17]	−0.23	[−0.58 0.09]
Workshop taught knowledge about intercultural competence/values regarding intercultural sensitivity (knowledge)	−0.27	[−0.51 0.00]	−0.08	[−0.45 0.23]
Workshop stimulated self-reflection about own cultural competence (attitude)	−0.49**	[−0.69 −0.30]	−0.36*	[−0.67 −0.05]
The workshop provided new perspectives on the topic (attitude)	−0.60**	[−0.74 −0.45]	−0.30	[−0.63 0.04]
Satisfaction with workshop elements				
Level of informational content	−0.23	[−0.46 0.05]	−0.11	[−0.48 0.18]
Level of relevance for every-day practice	−0.46**	[−0.65 −0.23]	−0.32*	[−0.64 0.02]
Level of benefit for own work	−0.53**	[−0.69 −0.34]	−0.21	[−0.59 0.10]

*$p < 0.05$; **$p < 0.01$. The sample for this analysis consisted of 40 teachers who provided valid data before and after the workshop. Migration background was coded 1 = no and 2 = yes. A Bootstrapping procedure with 1.000 samples was applied in the analysis.

around the material and the toolbox as well as the implementation of the toolbox in day-care centers and problems with the implementation due to COVID (see Table 4). One category focuses on elements of the training sessions and workshops. These results are reported in detail.

In-depth multipliers noted that in their opinion the training covered a lot of theoretical input and at the same time did not cover certain elements sufficiently (M4 "So sometimes I had the feeling that it was just a bit theoretical"; M5 "Instead of the 2nd unit in the in-depth training, it would be better to work on the modules more so that you can find your way in better"). In particular, in-depth multipliers criticized that it did not include enough knowledge about the toolbox, how to apply it correctly and how to deal with specific situations (M6 "For us, however, it also somehow had a lot to do with what was not done in the in-depth training"). They reported that they had to work out a lot for themselves after the training sessions (M6 "We had to spend a lot of time working on it ourselves afterwards") and therefore they felt uncertain regarding different aspects of the toolbox and its implementation (M6 "I was so unsure because I understood almost […] because we have never done anything like that here either"). Several times the wish was expressed to get to know the toolbox better during the training.

In-depth multipliers also reported changes in their teams. In their opinion a lot of self-reflection had taken place and this had triggered

change processes in the whole team. The training sessions strengthened them as a team due to the exchange of very private opinions and emotions they revealed to one another during the trainings and thus made their "system" stronger and changed the cohesion in the team. In addition, they noticed that they had been sensitized to discrimination, prejudices and stereotypes. They reported that before the training, there were many things they did not think about, for example whether a certain situation excluded one or some of the children, but after the training, they began to pay more attention in these critical situations.

3.3. Qualitative analysis: interviews with trainers

Analysis of the interviews with trainers (T1-T4) showed three major categories: (1) Evaluation of the trainings in terms of content and structure, (2) Online implementation and (3) Aspects of professionalization of day-care teachers (see Table 5).

Regarding (1), trainers rated the trainings as a good fit regarding the structure and content (T3 "I thought the topics were well chosen and I also thought the division was actually good, just as it was"). They deemed the duration of the training sessions a good fit as well as the

duration of training units and the division of these units. At the same time, some of the training units might be improved by shortening their duration (T1 "I would shorten it a bit in terms of content; that would really loosen things up"). All trainers stated that it is of great importance to encourage participants to engage in the exercises and to emotionally connect with the topic. They also noticed that participants wanted more concrete action instructions for the toolbox and for critical situations as well as a more concrete practice of the individual components (T2: "In the training, it became clear that they would have needed much more specific information about the components, that is, what they are supposed to work on with the children. Many questions remained open").

For (2), trainers focused on problems due to the platform, e.g., troubles with log in processes, and on problems arising from the fact that in some training sessions several participants shared one computer (T3 "Technically, we often had many problems, in data transmission, so it was often choppy, people got kicked out, were hard to hear or the image did not work"). For that reason, there were side conversations in some of the sessions that not all participants could partake in (T1 "With the groups that sat in front of one laptop together, it never worked that well"). Furthermore, trainers missed the possibilities for exchange among the participants in between the training units that on-site training sessions offer.

Concerning (3), trainers noticed that especially those sessions that emotionally evoked participants led to taking new perspectives (T2 "What consistently worked well for everyone was that we continually focused strongly on emotions, that they trace and write down their emotions. This was super important because it could create sympathy from it. That was also important for their learning processes"). For this to happen, teams needed to be able to trust one another (T4 "I believe that the team must be very familiar with each other, so that they can also deal openly with each other"). From the trainers' point of view, the respective team lead held the key position: If the team lead was positive and open toward the training and supported its implementation in the day-care center, it was easier for the teams to implement the exercises in depth and to develop further (T3 "The team lead can obviously somehow also set an example"). This was especially true for the challenge arising due to questioning one's own, possibly racist, thoughts patterns. Furthermore, this seems to have been particularly difficult for those participants who described themselves as interculturally aware and competent (T1 "There was really such a big oppositional stance"). Some trainers also noted that the process was easier for participants who already had prior knowledge of the subject.

4. Discussion

The present research aims at evaluating the impact of an intercultural training designed using the competence model for ECE (Fröhlich-Gildhoff et al., 2011). Therefore, effects on the three areas of knowledge, attitude and action in day-care teachers are discussed from the day-care teachers' perspective and the trainers' perspective.

Quantitative data based on retrospective standardized self-report questionnaires reveal that overall assessment of the training was positive, especially for improvement of professionalization and implementation of training elements. However, there are mixed results on satisfaction with training elements: Regarding professionalization of action, day-care teachers reported improvements in their ability to implement the trainings' topics into day-care center practice.

Furthermore, they stated that refreshing and extending their knowledge about intercultural competence and sensitivity were important parts in the training. Looking at attitudes, the training also led to intense self-reflection about their own intercultural competences and provided new perspectives to day-care teachers. So, in general, the intercultural training addressed all three areas of competence (Fröhlich-Gildhoff et al., 2011) based on ratings from the involved day-care teachers. Concerning their satisfaction with training elements, day-care teachers valued the trainings' level of informational content and relevance for their every-day practice as well as benefits for their own work. According to the evaluation, training elements seem to have been easy to apply and brought improvements of work satisfaction. The day-care teachers highlighted the training elements' potential to improve the children's social–emotional competence, but expressed reservations about the workshops impact on children's problematic behavior. Greenberg and Abenavoli (2016) point out that certain treatment effects may show immediately after a universal intervention (e.g., the reduction of aggression and improvement of social competence after a SEL intervention), but prevention effects often only occur after some time. Similar findings result from the evaluation of the PATHS curriculum, a program for social–emotional learning in schools (Kusché and Greenberg, 2012), as some changes did not show at post-test, but instead unfolded at one- or two-year follow-ups (Riggs et al., 2006; Malti et al., 2011; Crean and Johnson, 2013). Therefore, long-term follow-ups seem necessary to detect effects like these (Greenberg and Abenavoli, 2016). Also, in the education field even small effects could be considered as large according to Lipsey et al. (2012). All in all, ratings of day-care teachers confirm the universal approach of the workshops to be useful for all children, either in low or high risk situations regardless of their native language.

Next, we analyzed how different environmental risk factors are related to workshop assessments. It is a well-known phenomenon that risk groups with a high need for prevention have low participation rates in preventive programs (Ehlen et al., 2022). This also seems true for institutions in high-risk settings: Overall, only 16% of participating day-care centers reported more than two environmental risk factors. Bivariate analyses and results from multiple regressions show that day-care centers with a high migration status in their environment had lower expectations for the training to improve work satisfaction and children's social–emotional competences. They also did not feel that the workshops extended their knowledge about interculturality, stimulated their self-reflection or provided new perspectives. In addition, levels of relevance for every-day practice and benefits for work were rated low. An examination of environmental risk factors reveals a number of similarities, but also some differences. In summary, day-care teachers who subjectively reported living in a high-risk environment rated the workshop to be less effective regarding their extension of knowledge, stimulation of self-reflection or getting new perspectives. They also deemed the training to be of lower relevance for their every-day practice and benefits for their own work. Higher numbers of perceived risk factors in the environment were related to lower expectancies of training effectiveness for children. High migration environment was stronger related to training assessment than other risk factors in the environment. All in all, that indicates that trainings should be extended to include tailored elements for high-risk environments. It should be noted that a high-risk intervention strategy can only be effective when prior screening

TABLE 4 Categories and explanations of categories identified in interviews with in-depths multipliers.

Category	Explanation
Structure of the training	Feedback on the structure of the training and on the expectations of the training
Accompaniment/Support	Feedback on the accompaniment offered in the project, especially on case of questions during implementation
Evaluation of the modules	Feedback from day-care teachers on the modules themselves
Group organization	Implementation problems that have arisen dure to the organization of the groups in the day-care centers, for example, due to COVID-related emergency care or due to implementation with larger groups
Reception by the children	Reports on the children's feedback on the individual components of the project and children's perceived understanding by the day-care teachers
Structuring of the materials	Feedback on the design and structuring of the materials themselves, as well as in relation to the instructions and flexibility of the modules
Implementation	Experiences and adaptations in the actual implementation
Understanding of the toolbox	Feedback on the understanding of the toolbox
Suggestions	Proposals for future revisions and adjustments
Time allocation	Feedback on the implementation of the project within the time resources of the day-care center
Timing of the modules	Feedback on the implementation of the modules in the time allotted for the respective module
Other	One interviewee explicitly emphasized the importance of the project itself

for risk status is accurate (Greenberg and Abenavoli, 2016). Even though, a considerable uncertainty of fit remains, which justifies a more universal and broader approach (Merry and Spence, 2007; Shamblen and Derzon, 2009). Therefore, to foster professionalization in pedagogical staff, more effort should be invested to convince those in high-risk settings of the effectiveness of universal intervention programs. This might lead to higher motivation to implement program elements und also improve work-based self-efficacy. In addition, the results regarding the impact of risk factors and level of migration in the environment on ratings of program effectiveness might still reflect a deficit view of day-care teachers that was not addressed strong enough within the workshop elements. Although the present project tried to avoid any implicit or explicit promotion of a deficit view of migration status, for day-care teachers the need for compensatory education facing risky environments seemed to remain a prominent cognitive scheme that should be considered in more detail in future adaptations of the training concept.

Similar to quantitative data, qualitative data obtained from in-depths multipliers show a positive evaluation of the program with the necessity to readjust certain training elements and also allow a

deeper insight into their impressions: They would have liked to gain more (theoretical) knowledge about all elements of the toolbox. In their opinion, this would lead to a straightforward start into implementation without uncertainties and to being able to deal with specific situations. Despite many difficulties, especially with technical and organizational issues, the training elicited appropriate self-reflection, brought the respective teams closer together and raised (more) awareness of discrimination, prejudice and stereotypes.

In line with results from the recently conducted review by Romijn et al. (2021) in the present study, the transfer from workshop contents regarding intercultural knowledge and beliefs to enactment in every day ECE practice was judged as difficult by participating teachers, although they were provided with teaching materials and guided in implementing these materials in their institutions. Again, limited resources due to pandemic conditions resulting in high work-load and constant pressure to adapt to new working conditions might have hindered a more successful enactment of interculturally responsive practices.

Problems arising from technical and organizational difficulties were also mentioned by trainers in their interviews, as well as the impossibility for close interaction between workshop participants and between trainers and participants. They also pointed out the need for certain improvements, especially because they noted that participants had wanted more concrete action instructions and practice for the toolbox as well as for critical situations at work. This is in line with findings from several studies about workshops and practical material on intercultural and interreligious education in day-care centers: Practice-oriented and interactive training courses were rated as more popular (Wolking and Vestweber, 2020).

Overall, the trainers rated the trainings as well-structured and well-suited in terms of content. For them, emotional perspective-taking is the core component for an effective training with trust between participants being the most important prerequisite. Whether trust-building within the teams worked was perceived to be dependent on the team lead. The interviews also revealed some explanations for the day-care teachers' low estimation of effectiveness in high-risk day-care centers: The trainers found that participants who already rated themselves as interculturally aware and competent struggled most when questioning their own believes and admitting that they may need to scrutinize their own stereotypes and attitudes. Similar results were reported in several studies on intercultural and interreligious education in day-care centers (workshops and practical work): In pre-post comparison, subjective knowledge remained unchanged, intercultural perspective-taking improved slightly and intercultural awareness as well as openness decreased significantly, indicating a weak effect (Gräbs Santiago and Vestweber, 2020). According to Gräbs Santiago and Vestweber (2020), the latter can be explained by the fact that the intensive examination of intercultural topics can lead to a defensive attitude. If a workshop was multi-day, held in presence and provided space for informal exchange, positive results for intercultural perspective-taking were more pronounced (Gräbs Santiago and Vestweber, 2020). Therefore, trainers should be prepared to be confronted with these defensive attitudes and be able to intervene and trainings should allow the time for letting these processes happen.

It should also be discussed whether day-care teachers in high-risk environments are so used to large scale problems that they might overlook small improvements. Still, the program might have a

TABLE 5 Categories and explanations of categories identified in interviews with trainers.

Category	Explanation	Number of mentions
Evaluation of the trainings in terms of content and structure	Positive and negative aspects regarding the training content and structure, such as material and exercises for training sessions, duration of training sessions and division of training units	21
Online implementation	Technical problems with the training platform, limited possibilities for exchange online in between the training units, challenges due to the fact that some participants shared a computer	12
Aspects of professionalization of day-care teachers	Achieving new perspectives, especially with exercises that emotionally evoked participants, trust in the team necessary for opening up, challenge of questioning one's own, possibly racist, thought patterns	20

substantial overall benefit. In universal prevention, small improvements in high-risk populations have the potential to impact positively on population level and do not only affect the participating individuals, but also indirectly a larger spectrum, therefore non-participating individuals may profit from the preventive program (Greenberg and Abenavoli, 2016). This might be true for the intercultural context as well. It is therefore important to draw attention to small changes when working with day-care teachers to improve their professionalization. As recommended by Romijn et al. (2021) the present program addresses issues like self-reflection and provided helpful teaching material for ECE professionals that might help to implement sustainable strategies for intercultural education. However, as the program structure regarding workshop content was rather standardized at this stage of development, qualitative and quantitative results show that the assessment of the environmental context should be integrated into workshop planning to provide more tailored concepts for single institutions. Discussing the composition of the workshop elements to foster professionalization, a stronger focus on a critical self-reflection of the compensatory and deficit view regarding children with a migration and refugee background would probably have helped to improve workshop effectiveness (Sales et al., 2011).

Finally, it should be highlighted that to our knowledge among all scientifically sound and evidence-based programs for ECE as listed by CASEL[1] and the German database for prevention programs,[2] no program focuses on the combination of SEL with intercultural topics. Also, the main focus of existing programs remains on the development of children and not on empowering day-care teachers to work in intercultural overlapping situations based on a culturally informed practice.

4.1. Limitations

There are several limitations of this pilot study that need to be considered: First, serious implementation problems were caused due to the COVID-19 pandemic. All participating day-care centers were affected by pandemic-related closures and/or emergency and reduced care as well as with staff shortages due to illness during the project period. As a consequence, a rather high drop-out rate of participants and a variation of day-care teachers attending training sessions, participating in surveys and finally implementing the toolbox in their institutions resulted. We assume that this inconsistency

disrupted team processes as Wolking and Vestweber (2020) point out. Participation in an entire training series in a fixed group enables collegial cohesion, increases familiarity and stimulates a deeper reflection process. Furthermore, training measures are more effective when the majority of the day-care teachers participated as a team and the training was experienced as a collaborative project (Boschki and Schweitzer, 2020). These serious implementation problems may have negatively influenced the prevention and intervention success (Durlak et al., 2011) and also the professionalization of day-care teachers.

Second, inconsistencies in participation due to the COVID-19 pandemic also affected quantitative data collection, e.g., when due to illness or work overload day-care teachers missed to fill in all questionnaires. Despite prolonged times to fill in the questionnaires and multiple reminders from the project staff members, response rate of day-care teachers regarding quantitative data remained rather low. In addition to low response rates, a high variation in participation in surveys negatively affected analysis of quantitative data as the number complete datasets was rather low compared to the overall number of participants.

Third, the online context caused some interferences with the proper delivery of the online training: In several cases, day-care teachers had to share a device. This led to the risk of distraction and inattention within the group and may have consequently limited the readiness for intensive and emotional reflection processes.

Fourth, results were limited to self-reports from day-care teachers and interviews with in-depths multipliers and workshop trainers. A multi-informant approach including children and parents was not applicable due to restrictions regarding the project conditions: Apart from difficulties to receive valid information from young children, the project framework was restricted to the day-care center staff and it was not possible to include parental reports. In addition, due to the COVID-19 pandemic and the fact that all project parts were delivered online, it was not possible to visit day-care centers to collect observational data. However, addressing improvements of professionalization, day-care teachers self-assessment and professional assessment of trainers represent a valid source of information.

Fifth, the inclusion of a convenience sample of day-care institutions led to the problem that participating day-care centers reported rather low levels of risk in their environment. This is in line with the prevention paradox as mentioned above (Ehlen et al., 2022). In addition, most day-care teachers also reported rather high levels of individual job satisfaction. Therefore, future studies should include a more heterogeneous sample regarding environmental risk factors such as high rates of unemployment or low levels of job satisfaction within the day-care center staff.

4.2. Conclusion

Applying the general competence model explained above (Fröhlich-Gildhoff et al., 2011) to the results, it becomes apparent that developments have taken place in all three core areas: (theoretical and reflexive) knowledge, attitude, and actions. In accordance with current research, this study revealed the importance of combining scientific and practical knowledge (Dewe and Otto, 2015). The main focus of trainings should be on emotional self-reflection (Müller, 2012) and detailed hands-on exercises for specific situations in order to manage them in an innovative way (Fröhlich-Gildhoff et al., 2011)—in this case intercultural situations that need to be solved in a culturally informed manner. Besides improving topic relevant knowledge and skills, day-care teachers, especially in high-risk environments, should be encouraged to pay more attention to small improvements and to acknowledge the benefits resulting from those changes in the long run. While it is possible that deepening or intensifying the training may have additional benefits for the effectiveness of the training for day-care centers in high-risk environments, one has to keep in mind that a universal approach has the potential to reach and benefit a wide target population. Therefore, this study provides first insights into the value of this training program for the professionalization of day-care teachers in intercultural working and education situations.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving human participants were reviewed and approved by the ethical board of the DHGS Deutsche Hochschule für Gesundheit und Sport (German University of Health and Sports). The patients/participants provided their written informed consent to participate in this study.

Author contributions

UB, CE, and MH contributed to the conception and design of the study. CE collected the data. MH performed the quantitative analyses and reported results. UB analyzed the qualitative data and reported results. UB and CE wrote the first draft of the manuscript except the methods section. MH and UB wrote the first draft of the methods section. All authors contributed to the final and submitted version of the manuscript, read, and approved the submitted version.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Associations between teachers' professional competencies and the quality of interactions and relationships in preschool: findings from Austria

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The professionalization of preschool teachers is considered an important factor for ensuring and improving the quality of interactions and relationships. Findings on associations between teachers' professional competencies and the quality of interactions and relationships in preschools are not only inconsistent in general but also rare for early childhood education and care (ECEC) in Austria. Therefore, the aim of this study is to address this research gap by considering interaction quality at the child level (measured with the inCLASS) and preschool teachers' perceptions of the teacher–child relationship (measured with the STRS). A sample of 287 children from 89 Austrian preschools was examined. After including control variables, the results of regression analyses revealed that preschool teachers' beliefs on co-construction were negatively related to task orientation, whereas their beliefs on instruction were positively related to task orientation. Furthermore, preschool teachers' work engagement was positively related to conflict interactions. Regarding teacher–child closeness, a positive association with preschool teachers' work engagement was found. Results on teacher–child conflict showed a positive effect of preschool teachers' beliefs on instruction and negative effects of teachers' beliefs on co-construction and their self-efficacy. The findings are discussed in regard to the professionalization of preschool teachers.

KEYWORDS

interaction quality, relationship quality, professional competencies, beliefs, work engagement, self-efficacy, ECEC, preschool

Introduction

The quality of interactional processes that children experience with preschool teachers and peers in preschool[1] is often termed "process quality" or "interaction quality" (Schmidt et al., 2018), and research has shown that it predicts children's socioemotional, cognitive, and language-related competencies [Tietze et al., 1998; National Institute of Child Health and Human Development, and Early Child Care Research Network (NICHD ECCRN), 2006; Sylva et al., 2006; Burger, 2010; Ulferts et al., 2019]. The same is true with regard to the quality of teacher–child relationships in preschool, which have been shown to be predictive of the development of children's competencies as well (O'Connor and McCartney, 2007; Ahnert and Harwardt, 2008; Sabol and Pianta, 2012; Paes et al., 2023). In view of such findings, research has focused on the characteristics associated with the quality of interactions and relationships. In this regard, previous research has identified predictors of interaction and relationship quality of preschool children, such as structural characteristics, child characteristics, and activity settings (Rudasill et al., 2006; Tietze et al., 2013; Smidt and Embacher, 2023a,b).

The professionalization of preschool teachers is also discussed as an important factor to ensure and improve the quality of interactions and relationships in preschool (Durand et al., 2016; Smidt, 2018; Sanches-Ferreira et al., 2022). This becomes apparent in professionalization models[2] (e.g., Fröhlich-Gildhoff et al., 2011; Anders, 2012) where preschool teachers' professional competencies are considered to be predictive of the quality of pedagogical practices in preschools in terms of educational beliefs (e.g., beliefs about how children should be supported), self-regulatory skills (e.g., work engagement), and motivational and emotional aspects (e.g., self-efficacy), along with other characteristics such as vocational knowledge and personality traits. In part, these models were initially developed for the school context (Baumert and Kunter, 2006) and subsequently applied to preschools (Anders, 2012). Previous empirical findings indicate that preschool teachers' educational beliefs, work engagement, and self-efficacy can influence the quality of interactions and relationships in preschool (e.g., Pianta et al., 2005; Hamre et al., 2008; Penttinen et al., 2020). However, there are also studies revealing quite weak or even a lack of associations (e.g., Hu et al., 2021; Peters et al., 2022).

Most previous research has been conducted outside of Austria and indicates only limited generalizability to specific country contexts such as Austria (e.g., see Love et al., 2003 for a comparison of findings of a US study to other countries). For example, a specific characteristic of the professionalization of preschool teachers in Austria is that they have to complete 5 years of vocational training and do not need an academic degree, as is common in many countries (Smidt, 2018). Against this background, the aim of this study is to investigate associations between preschool teachers' educational beliefs, work engagement, and self-efficacy with interaction quality and relationship quality in preschools with a focus on Austria. This aim is linked to the intention to obtain recent insights into the predictive importance of preschool teachers' competencies for the quality of interactions and relationships in Austrian preschools, which may lead to practical implications for improving preschool teachers' education and training.

The quality of interactions in preschool

The quality of interactions in preschool can be theoretically framed with ecosystemic approaches (Bronfenbrenner and Morris, 2006) that highlight the preschool class as a microsystem where children and preschool teachers are involved in interactions and activities. Other foundations for interaction quality in preschool include social constructivist approaches based on Vygotsky (Bodrova and Leong, 2018), which emphasize the function of preschool teachers as co-constructors, and domain-specific theories (Wellman and Gelman, 1998), which allow us to focus on specific domains such as language and mathematics (Anders et al., 2012; Smidt and Rossbach, 2016). When asking what comprises "good" quality of interactions, reference can be made to developmentally appropriate practices (Copple and Bredekamp, 2009), according to which children should experience developmentally appropriate interactions and activities covering different domains (e.g., language, mathematics). Preschool teachers are expected to provide enriching pedagogical activities, facilitate social relationships, and ensure healthy and safe care (Tietze et al., 1998; Cryer, 1999; Smidt and Rossbach, 2016). There is no standard method for measuring the quality of interactions, and research findings may differ based on various methodological aspects, including instrumental measurement of quality with specific focal points or level of aggregation with foci on children and/or preschool teachers (e.g., Halle et al., 2010). For instance, some instruments measure interaction quality focusing on specific domains such as literacy or mathematics (e.g., Four Curricular Subscales Extension to the Early Childhood Environment Rating Scale, ECERS-E, Sylva et al., 2011), whereas others measure more global aspects (e.g., Classroom Assessment Scoring System, CLASS Pre-K, Pianta et al., 2008). Furthermore, some instruments focus on the level of the preschool group (e.g., CLASS Pre-K, Pianta et al., 2008), whereas others focus on the level of the specific child (e.g., Individualized Classroom Assessment Scoring System, inCLASS, Downer et al., 2012).

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1 National education systems use different terms for out-of-home educational settings for children up to school age, and translation into English can be challenging [e.g., see the country profiles of Austria and Sweden (Schreyer and Oberhuemer, 2017a,b)]. In Austria, the term "Kindergarten" is often used in German when referring to institutions attended by children from around 3 years of age until they start school (Hartel et al., 2019). However, the term "Kindergarten" can be misleading because in the USA it refers to facilities for children aged 5 (but not for 3 and 4 year olds) (Kamerman and Gatenio-Gabel, 2007). We therefore use the term "preschool" and the terms "preschool teachers" and "preschool children". By "preschool," we usually refer to institutions attended by children from about 3 years of age until school entry (Smidt, 2018).

2 With the term "professionalization model," we refer to a notion of professionalization. There are different professionalization models: For instance, Thole and Polutta (2011) distinguish seven professionalization models, including competence-based models, evidence-based models, and reflexive models of professionalization.

The quality of relationships in preschool

The quality of relationships in preschool can be framed with the "Conceptual Model of Child-Teacher Relationships" (Pianta et al., 2003), which is based on attachment theory and ecosystemic approaches. A basic assumption is that relationships are marked by the complex interaction of four elements. *Features of individuals* (e.g., gender, self-efficacy) are considered the most basic elements of relationships. *Representational models* can be understood as a "set of feelings and beliefs that has been stored about a relationship that guides feelings, perceptions, and behavior in that relationship" (Pianta et al., 2003, p. 210). *Information exchange processes* can be defined as mutual exchanges and particularly the way in which information is shared between a preschool teacher and a child. With *external influences,* cultural and structural characteristics of the preschool also need to be considered (Pianta et al., 2003).

The "Student-Teacher Relationship Scale" (STRS; Pianta, 2001) is frequently applied as an instrument to capture the quality of relationships in preschools. The STRS covers "closeness" (the degree to which a teacher views a relationship with a child as being friendly and warm), "conflict" (the extent to which a preschool teacher struggles with a child and considers the child to be angered or incalculable), and "dependency" (the degree of seeing the child as demanding help when not necessary and responding severely to separation from the preschool teacher). In many studies, however, only "closeness" and "conflict" are investigated (Verschueren and Koomen, 2021).

Professional competencies

The professionalization of preschool teachers has been discussed as a key factor to ensure high-quality educational practices in preschool. There are different theoretical concepts and definitions for professionalization (Thole and Polutta, 2011; Smidt et al., 2017). In the current study, we rely on competence-based models of professionalization, which provide a framework to examine the skills and abilities of pedagogues that are relevant to action in practice. According to Anders (2012), professional competencies of preschool teachers comprise professional knowledge (which is not the subject of this study), educational beliefs, self-regulatory skills, and motivational and emotional aspects.

Educational beliefs can be seen as emotional–cognitive traits that influence how one interprets certain situations (filter function), how one acts in those situations (frame function), and whether or how one changes beliefs through new information and experiences (guide function) (Fives and Buehl, 2012). Educational beliefs are multifaceted and can include a preschool teacher's view on how to support children in their development (e.g., Schmidt and Smidt, 2021), preschool teacher's educational goals (e.g., Smidt et al., 2015), and preschool teachers' views on what practices are developmentally appropriate or inappropriate (e.g., Leung, 2012). Educational beliefs are considered to be rather stable but could be modified or rethought based on the preschool teacher's new content knowledge, experiences, and self-reflective processes, which could be derived from professional training, for instance (Anders, 2012; Fives and Buehl, 2012).

Self-regulatory skills such as work engagement are connected with personal wellbeing and health, which further influence work performance (e.g., Bakker et al., 2014). Work engagement is a positive state of mind toward one's own work (Schaufeli and Bakker, 2004). Work-related personal compassion and happiness contribute to balanced work engagement among preschool teachers and thus serve as protective factors for wellbeing and health (De Stasio et al., 2020).

Regarding motivational and emotional aspects, self-efficacy is one of the central characteristics of research on early childhood (Tschannen-Moran and Hoy, 2001). Self-efficacy refers to the belief in one's own capability to perform at a desired level and is related to the confidence of preschool teachers in their own abilities to perform successfully in the classroom. Therefore, self-efficacy impacts preschool teachers' motivation to (re-)act and affects how much effort they put forth in daily situations and challenges. This also includes feelings of being capable or incapable of offering relevant learning situations for children or supporting children in their development and learning.

Associations between professional competencies and the quality of interactions and relationships in preschool

Professionalization models point to the importance of preschool teachers' professional competencies for their pedagogical actions and educational quality (for an overview, see Anders, 2012). In addition, personal characteristics of the preschool teachers, such as teachers' beliefs, self-efficacy, or work engagement, which are considered professional competencies in this study, can be discussed in the context of the conceptual model of teacher–child relationships described by Pianta et al. (2003). As Pianta et al. (2003) noted, features of individuals are an essential element of teacher–child relationships. For example, teachers' beliefs and perceptions of children and their role are seen as important in shaping supportive relationships (Myers and Pianta, 2008).

Although associations can be assumed between professional competencies and the quality of interactions and relationships in preschool, research findings thus far have been inconsistent. Regarding teacher beliefs, Pianta et al. (2005) showed that interaction quality was higher among preschool teachers with less teacher-centered and more child-centered beliefs. In interactions with classroom age diversity, preschool teachers' child-centered beliefs also have a buffering effect on interaction quality (Ansari and Pianta, 2019). Furthermore, Wieduwilt et al. (2023) reported a marginally significant positive association of child-centered beliefs supporting language education embedded in daily routines and an aspect of interaction quality and also a negative association of teacher-directed beliefs supporting additional language programs and another aspect of interaction quality. In contrast to these findings, Hamre et al. (2008) showed that for children with high levels of problem behavior, more authoritarian, teacher-centered beliefs were related to better relationships in terms of less teacher–child conflicts. Other studies found weak or even a lack of associations between preschool teachers' beliefs and teacher

practices, interaction quality and relationship quality (Wilcox-Herzog, 2002; Mashburn et al., 2006; Wen et al., 2011; Peters et al., 2022).

Regarding work engagement, higher work engagement was found to have positive effects on different aspects of interaction quality in kindergarten and elementary schools (Penttinen et al., 2020; Soininen et al., 2023). Furthermore, the job demands–resources model (e.g., Bakker, 2011; Bakker et al., 2014; Bakker and Demerouti, 2017) suggests that work engagement in general has a positive effect on job performance as persons with higher work engagement more often experience positive emotions (e.g., joy, enthusiasm), which help them to expand their thought–action repertoire and to build resources. However, there have been few studies with a focus on work engagement and the quality of interactions (especially at the individual child level) and relationships in preschools.

With regard to self-efficacy, recent studies found positive associations between self-efficacy and aspects of interaction quality in preschool classrooms (Jennings, 2015; Hu et al., 2021; Wolstein et al., 2021). Furthermore, higher levels of preschool teachers' self-efficacy were associated with higher relationship quality in terms of more closeness and fewer conflicts between teachers and children (Mashburn et al., 2006; Hamre et al., 2008). However, some studies found unexpected or even a lack of associations between self-efficacy and the quality of interactions and relationships (Zee and Koomen, 2016; Hu et al., 2021).

Preschool education in Austria

While the research reported so far provides valuable insights, its generalizability to preschool education in Austria remains limited. Preschool education in Austria is regulated by the nine federal states in terms of personnel, structures, and technical supervision, while the training of preschool teachers and guidelines on educational work are mainly regulated by the federal government (Hartel et al., 2019). The vocational qualification of preschool teachers regularly takes 5 years and occurs at colleges of higher vocational education and training (BAfEPs). In addition, BAfEPs can offer post-secondary courses for holders of a higher education entrance qualification. The age of prospective teachers at the beginning of the 5-year educational training period is around 14 years, which is low (Hartel et al., 2019). Around 98% of the pedagogical staff working in preschools and similar institutions in Austria is female (Krenn-Wache, 2017). The proportion of male staff is thus about 2%, which is significantly lower than in many other countries (e.g., Denmark, where about 13% of preschool staff are male; Jensen, 2017). Compared to other countries, the proportion of academics among preschool teachers is also low (Smidt et al., 2017; Hartel et al., 2019). Preschools in Austria have their own educational mandate, which is specified in the Nationwide Framework Curriculum for Austrian ECEC Services (Charlotte Bühler Institut, 2009) that defines educational domains (e.g., language, emotions) and conducive pedagogical behavior. Preschools in Austria are usually attended by children from the age of 3 until they start school, with the last year of preschool (the year before starting school) being compulsory for all children since 2009 (Smidt, 2018). Depending on the legal foundations of each federal state, group sizes in the preschools may range from 20 to 25, with one preschool teacher plus at least half an assistant in each group (Hartel et al., 2019). Thus, legally defined staff–child ratios in preschool groups vary among the federal states with ratios, ranging from 1:12 to 1:17 (Schreyer and Oberhuemer, 2017a).

Study aims

The quality of interactions and relationships that children experience in preschool has been shown to be predictive of children's competencies and is influenced by different aspects such as structural characteristics and child characteristics. Theoretical frameworks and empirical findings suggest that preschool teachers' professionalization in terms of educational beliefs, work engagement, and self-efficacy also have predictive importance for the quality of interactions and relationships in preschool. However, there are also some caveats. (1) Research findings are generally inconsistent, with some studies reporting no associations. (2) There is a lack of studies on the situation in preschools in Austria, and international research findings likely have only limited transferability. Therefore, the aim of the present study is to address this research gap by identifying associations between the professional competencies of preschool teachers (educational beliefs, work engagement, and self-efficacy) and the quality of interactions and relationships that children experience in preschool. Child characteristics and structural characteristics served as controls.

Materials and methods

Participants

This study used data from the Austrian project "Quality of children's interactions in preschool," which was funded by the Austrian Science Fund (FWF). The study focuses primarily on the second wave, for which data collection took place between October and December 2019. The sample comprises 287 children (141 girls) from 89 preschool classes (from 89 randomly selected preschools) in Tyrol, Austria. The children were 3 to 5 years old ($M = 54.89$ months, $SD = 4.39$, minimum = 40.31, maximum = 63.08). Data from 85 preschool teachers (84 female) were collected with paper–pencil questionnaires. The preschool teachers were 38.13 years old on average ($SD = 11.73$) and had $M = 14.84$ years of work experience ($SD = 10.85$).

All preschool teachers had completed vocational training, with 85.88% having completed 4 or 5 years of non-academic training, 11.76% having completed shortened 2-year training (for students with a university entrance qualification), and 2.35% having completed other vocational training. Overall, 35.29% of the preschool teachers had a leading function in the preschool. To comply with ethical guidelines, identifiable information was protected, and data were anonymized to guarantee personal privacy. Furthermore, the participants (parents as representatives for their children) signed an informed consent form.[3]

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3 An ethical review/approval was not required for this study.

Measures

Interaction quality

As mentioned in the section "The Quality of Interactions in Preschool," there are various ways to capture interaction quality, including observation measures focusing on the level of the preschool group and the level of the individual child. An important advantage of measures focusing on the individual child compared to measures focusing on the level of the preschool group is that variations in the experiences of individual children regarding their interaction with their preschool teacher and peers can be assessed (Chien et al., 2010; Smidt and Rossbach, 2016). Therefore, interaction quality was measured at the individual child level with the observation tool "Individualized Classroom Assessment Scoring System" (inCLASS, Downer et al., 2012). This tool measures children's interactions with teachers (e.g., the child's communication with teachers), peers (e.g., the child's experience of positive emotions with peers), and tasks (the degree to which the child is actively involved in tasks and activities) (Downer et al., 2010). Based on previous research (Downer et al., 2010; Slot et al., 2015; von Suchodoletz et al., 2015; Bohlmann et al., 2019; Smidt and Embacher, 2021), the 10 inCLASS dimensions were grouped into the following factors: *teacher interactions* ($\alpha = 0.85$), which includes positive engagement with the teacher and teacher communication, *peer interactions* ($\alpha = 0.85$), which includes peer sociability, peer communication, and peer assertiveness, *task orientation* ($\alpha = 0.58$), which includes task engagement and self-reliance, and *conflict interactions* ($\alpha = 0.74$), which includes teacher conflict, peer conflict, and behavior control (reverse coded). See **Table 1** for descriptive statistics and **Table 2** for intercorrelations. Except for task orientation, the internal consistencies of the factors are acceptable to good (Nunnally, 1978).

On one observation day (typically from 8 a.m. to 12 p.m.), up to four children from one preschool class were observed with up to four alternating observation cycles in different situations (e.g., free play, mealtime, planned activity). According to the manual, four cycles per child (a total of 16 observations for four children) can be completed in a 4-h visit (Downer et al., 2012). One cycle lasts 15 min, with 10 min for observing children and note-taking followed by 5 min for scoring in consultation with the manual (Downer et al., 2012). To determine scores, each dimension receives a code of 1 to 7 indicating a low (1 or 2), medium (3 to 5), or high (6 or 7) level, and data from each observation cycle are averaged to obtain a final score (Downer et al., 2010).

Data collection was carried out by 13 student assistants (students of educational science and psychology), who completed 2 days of training by a certified inCLASS trainer, which included a reliability test. In the first wave of the study, double coding was conducted to examine inter-rater reliability. Intraclass correlation coefficients (ICCs) of the single domains ranged between 0.75 and 0.95, indicating excellent inter-rater agreement (Cicchetti, 1994; see Smidt and Embacher, 2023a for information on the first study wave).

Relationship quality

Preschool teachers rated their perception of their relationship with a particular child using a short form of the "Student-Teacher Relationship Scale" (STRS) (Pianta, 2001), which includes 15 items

rated on a five-point scale ranging from 1 ("definitely does not apply") to 5 ("definitely applies") (Pianta, 1992). The German version used here was also part of the NUBBEK study (Tietze et al., 2015). The *closeness* subscale consists of eight items ($\alpha = 0.87$, e.g., "I share an affectionate, warm relationship with this child"), and the *conflict* subscale consists of seven items ($\alpha = 0.89$, e.g., "This child easily becomes angry at me"). For each subscale, a sum score of the individual items was calculated (Pianta, 2001).

Professional competencies

Preschool teachers' educational beliefs regarding their support of children were measured with a scale that was used in a German study (Schmidt and Smidt, 2021). The scale consists of 12 items assigned to subscales: *beliefs on self-education* (four items, $\alpha = 0.69$., e.g., "When supporting children, it is important that the preschool teacher interfere as little as possible"), *beliefs on co-construction* (four items, $\alpha = 0.52$, e.g., "When supporting children, it is important that the children are encouraged by the preschool teacher to find their own solutions"), and *beliefs on instruction* (four items, $\alpha = 0.79$, e.g., "When supporting children, it is important that the children are taught a lot by the preschool teacher"). Each item was rated on a five-point scale ranging from 1 ("strongly disagree") to 5 ("strongly agree") (Schmidt and Smidt, 2021).

In contrast to the other study variables, preschool teachers' educational beliefs regarding their support of children were partially measured during the first study wave (from April to June 2019), which took place about half a year before the second wave. Due to time and economic reasons, preschool teachers participating in the first wave of the study (71.76% of the preschool teachers in the current sample) did not have to rate their beliefs on self-education, co-construction, and instruction again in the second wave. In these cases, data from the first wave were used. For newly participating preschool teachers (28.24% of the sample), data on educational beliefs were collected during the second wave (from October to December 2019).

Preschool teachers' *work engagement* was assessed with the "Utrecht Work Engagement Scale" (UWES-9) (Schaufeli et al., 2006). This short form consists of nine items ($\alpha = 0.94$, e.g., "At my work, I feel bursting with energy"), which are rated on a seven-point scale ranging from 0 ("never") to 6 ("always") (Schaufeli et al., 2006). Preschool teachers' *self-efficacy* was captured with the "Kurzskala zur Erfassung allgemeiner Selbstwirksamkeitserwartungen (short scale for measuring general self-efficacy beliefs)" (ASKU) (Beierlein et al., 2013), which measures general self-efficacy beliefs with three items ($\alpha = 0.86$, e.g., "I can rely on my own abilities in difficult situations") that are rated on a five-point scale ranging from 1 ("strongly disagree") to 5 ("strongly agree").

Child characteristics and structural characteristics

Based on previous study findings (e.g., Justice et al., 2008; Rudasill and Rimm-Kaufman, 2009; Downer et al., 2012; Linberg and Kluczniok, 2020; Ramirez and Linberg, 2022; Smidt and Embacher, 2023a,b), child characteristics (age, gender, language skills, personality types) and structural characteristics (child–staff ratio, preschool teachers' work experience, number of children with immigration background per preschool class, and adequate

TABLE 1 Descriptive results.

	N	%	M	SD
Interaction quality				
Teacher interactions	287		2.16	0.91
Peer interactions	287		2.98	0.88
Task orientation	287		4.43	0.81
Conflict interactions	287		1.26	0.35
Relationship quality				
Teacher–child closeness	275		33.25	6.08
Teacher–child conflict	273		11.55	6.07
Professional competencies				
Beliefs on self-education	85		4.01	0.62
Beliefs on co-construction	85		4.55	0.43
Beliefs on instruction	85		2.62	0.77
Work engagement	85		4.76	0.87
Self-efficacy	85		4.33	0.51
Child characteristics				
Gender of the children	287			
girls	141	49.13		
boys	146	50.87		
Age of the children (in months)	287		54.89	4.39
Language skills (*T*-value) of the children	262		47.88	9.49
Child personality types	282			
Overcontrollers	69	24.47		
Undercontrollers	88	31.21		
Resilients	125	44.33		
Structural characteristics				
Child–staff ratio	80		7.47	2.06
Work experience of the preschool teachers	85		14.84	10.85
Number of children with immigration background per preschool class	84		3.76	5.00
Adequate equipment in the preschool class	85		2.24	0.42

N = sample size, % = percent, M = mean, SD = standard deviation.

equipment in the preschool class) were considered as control variables. The *age* of the children and their *gender* were captured through paper–pencil interviews or telephone interviews with their parents. Children's *language skills* were measured with a mean score (*T*-value) of three subtests (understanding sentences, morphological rule formation, and phonological working memory, $\alpha = 0.73$) of the "Sprachentwicklungstest für drei- bis fünfjährige Kinder (language development test for 3 to 5-year-old children)" (SETK 3–5) (Grimm, 2015).

Child personality was measured using the "Fünf Faktoren Fragebogen für Kinder—Kurzform (Five Factor questionnaire for children – short version)" (FFFK-K) (Asendorpf, 2007), which was developed within the framework of the Socio-Economic Panel (SOEP). Preschool teachers assessed children's personality with 10 bipolar items (originally rated on an 11-point scale ranging from 0 to 10), which were assigned to the following factors: neuroticism ($\alpha = 0.71$; e.g., worried−calm),

extraversion ($\alpha = 0.85$; e.g., talkative−quiet), intellect ($\alpha = 0.73$; e.g., interested−uninterested), agreeableness ($\alpha = 0.73$; e.g., gentle−stubborn), and conscientiousness ($\alpha = 0.60$; e.g., orderly−disorderly) (Asendorpf, 2007; see Smidt and Embacher, 2023a for further information on the use of the questionnaire in the first study wave).

Three personality types have been shown to be predictive of several social outcomes and problem behaviors among children: *resilients*, *overcontrollers,* and *undercontrollers* (e.g., Asendorpf and van Aken, 1999; Hart et al., 2003; van den Akker et al., 2013). To derive these types, we followed the method of Asendorpf et al. (2001) and conducted a two-step clustering procedure (Ward, followed by k-means) (for a detailed description, see Smidt and Embacher, 2023a). The "Big Five" cluster profiles show that resilients are characterized by below-average scores on neuroticism and above-average scores on extraversion, intellect, agreeableness, and conscientiousness. Overcontrollers

TABLE 2 Intercorrelations between study variables.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1	–																			
2	0.24***	–																		
3	0.24***	0.45***	–																	
4	−0.14*	0.04	−0.12*	–																
5	0.23***	0.07	0.09	−0.07	–															
6	−0.10#	−0.08	−0.12#	0.28***	−0.57***	–														
7	−0.06	0.08	−0.05	0.07	0.03	−0.04	–													
8	0.02	0.11#	−0.06	0.11#	0.09	−0.18**	0.25***	–												
9	−0.08	0.04	0.16**	−0.08	−0.05	0.01	−0.30***	0.12#	–											
10	0.08	0.11#	0.08	0.16**	0.34***	−0.20***	0.22***	0.40***	−0.02	–										
11	−0.13*	−0.01	0.04	0.03	0.15*	−0.19**	0.04	0.03	−0.01	0.33***	–									
12	−0.07	−0.02	0.10#	0.21***	−0.11#	0.06	−0.13*	−0.09	−0.03	0.00	0.04	–								
13	0.05	0.29***	0.16**	0.01	0.08	−0.15*	0.00	0.08	0.12*	0.05	−0.06	0.01	–							
14	0.14*	0.18**	0.17**	−0.14*	0.15*	−0.19**	−0.10	0.03	0.02	−0.03	−0.04	−0.03	−0.03	–						
15	−0.18**	−0.19**	−0.14*	−0.02	−0.39***	0.04	−0.06	−0.01	0.00	−0.07	0.02	0.09	−0.01	−0.30***	–					
16	0.00	0.00	−0.05	0.17**	0.03	0.27***	0.03	0.01	−0.12#	0.03	0.06	0.06	−0.12*	−0.04	− 0.38***	–				
17	0.15#	0.16**	0.16**	−0.14*	0.31***	−0.28***	0.03	0.00	0.11#	0.03	−0.08	−0.13*	0.12*	0.29***	−0.51***	−0.60***	–			
18	−0.02	0.05	−0.03	−0.06	−0.19**	0.06	−0.05	−0.04	0.16*	−0.31***	−0.04	−0.03	0.11#	0.08	−0.04	−0.08	0.11#	–		
19	−0.02	−0.01	0.04	−0.03	−0.16**	−0.04	0.03	−0.07	0.03	−0.17**	0.22***	0.04	0.05	−0.14*	0.07	−0.03	−0.03	0.14*	—	
20	−0.15*	−0.13*	−0.10#	0.00	−0.14*	0.09	0.08	−0.13*	0.05	−0.09	0.02	0.02	−0.03	−0.31***	0.16**	−0.07	−0.07	0.18**	0.31***	—
21	0.10	0.00	−0.02	0.06	0.05	−0.05	−0.01	0.18**	−0.15*	0.09	−0.05	−0.07	0.09	−0.12#	0.00	0.03	−0.03	−0.06	0.20**	0.04

Pearson's correlations were computed. 1 = teacher interactions, 2 = peer interactions, 3 = task orientation, 4 = conflict interactions, 5 = teacher–child closeness, 6 = teacher–child conflict, 7 = beliefs on self-education, 8 = beliefs on co-construction, 9 = beliefs on instruction, 10 = work engagement, 11 = self-efficacy, 12 = gender of the children (0 = girls, 1 = boys), 13 = age of the children (in months), 14 = language skills of the children, 15 = overcontrollers, 16 = undercontrollers, 17 = resilients, 18 = child–staff ratio, 19 = work experience of the preschool teachers, 20 = number of children with immigration background per preschool class, 21 = adequate equipment in the preschool class.
#$p < 0.10$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

are described by above-average scores on neuroticism and below-average scores on extraversion, intellect, agreeableness, and conscientiousness. Undercontrollers score above average on extraversion and below average on neuroticism, intellect, agreeableness, and conscientiousness.

Referring to previous studies (e.g., Asendorpf et al., 2001; Barbaranelli, 2002), a double-cross validation was applied to evaluate the consistency of the three-cluster solution across 10 different subsamples (see Smidt and Embacher, 2023a). The median κ-value was κ = 0.81, which is considered acceptable (Asendorpf et al., 2001). Regarding structural characteristics, the *child–staff ratio*, preschool teachers' *work experience,* and the *number of children with an immigration background per preschool class* were determined from the information provided by the preschool teachers. The child–staff ratio was calculated by dividing the number of children in the preschool group by the number of staff (preschool teachers and assistants) in the group. The resulting number indicates how many children are cared for per staff member. Work experience was measured by asking preschool teachers how many years in total they had been working in the profession. The number of children with an immigration background per preschool class was computed on the basis of the information provided by the preschool teachers. Preschool teachers' perception of *adequate equipment in the preschool class* (e.g., sufficient writing materials, books) was captured with seven items (α = 0.65) from a scale used in the German BiKS study (based on the Home Observation for Measurement of the Environment, Caldwell and Bradley, 1984). Preschool teachers had three answer options (The following tools are available so often that. 1 = some children can play with it, 2 = about half of all children can play with it, 3 = almost all children can play with it).

Data analyses

To study associations between professional competencies and aspects of both interactional quality and relationship quality, multiple hierarchical regression analyses were conducted with the four factors of the inCLASS (*teacher interactions, peer interactions, task orientation,* and *conflict interactions*) and the two subscales of the STRS (*teacher–child closeness* and *teacher–child conflict*) as dependent variables. Preschool teachers' beliefs on self-education, co-construction, and instruction, as well as work engagement and self-efficacy, served as predictors (step 1). In the next step, child characteristics (gender, age, language skills, and personality types) and structural characteristics were considered as control variables (step 2). Robust standard errors were calculated in Stata as the children were nested in preschool classes (Williams, 2000). Due to missing values, the sample sizes in the regression analyses were reduced to $N = 231$ (see Table 3) and $N = 225$ (see Table 4).

Results

The descriptive results are presented in Table 1, and intercorrelations of the study variables are shown in Table 2. Tables 3, 4 present detailed results of the regression analyses (step 1 and step 2), including unstandardized and standardized regression coefficients, clustered robust standard errors, F-test, coefficient of determination (R^2), adjusted R^2, and change in R^2.

Interaction quality

The results of *teacher interactions* showed no significant effects of teachers' beliefs on self-education, co-construction and instruction, work engagement, and self-efficacy. The gender of the children (only $p < 0.10$) and classification as an overcontroller were negatively related to *teacher interactions*. Regarding *peer interactions,* no significant effects of teachers' beliefs on self-education, co-construction and instruction, work engagement, and self-efficacy were found. However, the language skills of the children (only $p < 0.10$) and their age were positively related to *peer interactions*. The findings of *task orientation* showed that preschool teachers' beliefs on co-construction were negatively related to *task orientation*, whereas teachers' beliefs on instruction were positively related to *task orientation*. However, there were no effects of preschool teachers' beliefs on self-education, work engagement, and self-efficacy on *task orientation*. Language skills of the children were positively related to task orientation, and gender (only $p < 0.10$) tended to have a positive effect on *task orientation*. Furthermore, classification as an overcontroller (only $p < 0.10$) tended to be negatively related to *task orientation*. Regarding *conflict interactions,* positive effects of work engagement were found. Preschool teachers' beliefs on self-education, co-construction and instruction, and self-efficacy were not related to *conflict interactions*. Gender and classification as an undercontroller had positive effects on *conflict interactions*. Furthermore, language skills (only $p < 0.10$) and work experience (only $p < 0.10$) tended to be negatively related to *conflict interactions*.

Relationship quality

The findings of *teacher–child closeness* showed a positive effect of preschool teachers' work engagement. Furthermore, self-efficacy (only $p < 0.10$) tended to be positively related to *teacher–child closeness*. Preschool teachers' beliefs on self-education, co-construction, and instruction were not related to *teacher–child closeness*. The age of the children was positively related to *teacher–child closeness*. Moreover, classification as an overcontroller or undercontroller was negatively related to *teacher–child closeness,* and the child–staff ratio (only $p < 0.10$) tended to be negatively related to *teacher–child closeness*. The results of *teacher–child conflict* showed a negative effect of teachers' beliefs on co-construction and a positive effect of teachers' beliefs on instruction. In addition, teachers' self-efficacy was negatively related to *teacher–child conflict*. There were no effects of teachers' beliefs on self-education and work engagement on *teacher–child conflict*. Language skills of the children were negatively related to *teacher–child conflict,* and a classification as an undercontroller was positively related to *teacher–child conflict*.

Discussion

Relying on a framework of professionalization, the present study investigated associations between professional competencies of preschool teachers in terms of educational beliefs, work engagement, self-efficacy, and the quality of interactions and

TABLE 3   Prediction of interaction quality through professional competencies.

Predictors	Teacher interactions			Peer interactions			Task orientation			Conflict interactions		
	B	SE	β	B	SE	β	B	SE	β	B	SE	β
Step 1												
Professional competencies												
Beliefs on self-education	−0.19	0.15	−0.12	0.06	0.11	0.04	−0.01	0.09	−0.01	−0.02	0.04	−0.04
Beliefs on co-construction	0.06	0.21	0.03	0.04	0.17	0.02	−0.46	0.19	−0.24*	0.01	0.05	0.02
Beliefs on instruction	−0.14	0.10	−0.12	0.08	0.09	0.07	0.24	0.07	0.23**	−0.01	0.02	−0.02
Work engagement	0.18	0.12	0.16	0.10	0.09	0.10	0.04	0.08	0.04	0.07	0.02	0.19**
Self-efficacy	−0.28	0.20	−0.16	−0.06	0.12	−0.03	0.18	0.14	0.12	−0.02	0.04	−0.03
R^2 (R^2 adjusted)	0.05	(0.03)		0.02	(−0.00)		0.09	(0.07)		0.03	(0.01)	
F	0.85			0.88			3.51**			2.11#		
Step 2												
Professional competencies												
Beliefs on self-education	−0.21	0.14	−0.14	0.08	0.10	0.06	0.04	0.09	0.03	−0.01	0.04	−0.02
Beliefs on co-construction	0.03	0.20	0.01	0.06	0.18	0.03	−0.48	0.17	−0.25**	0.00	0.05	0.01
Beliefs on instruction	−0.14	0.09	−0.11	0.03	0.12	0.03	0.28	0.08	0.26**	0.01	0.02	0.02
Work engagement	0.17	0.13	0.15	0.07	0.10	0.07	−0.03	0.08	−0.03	0.06	0.03	0.17*
Self-efficacy	−0.24	0.20	−0.14	−0.01	0.16	−0.01	0.24	0.16	0.16	0.00	0.04	0.00
Child characteristics												
Gender (0 = girls, 1 = boys)	−0.19	0.10	−0.10#	0.01	0.10	0.01	0.17	0.09	0.11#	0.12	0.04	0.19**
Age (in months)	0.00	0.01	0.01	0.06	0.01	0.30***	0.02	0.01	0.09	−0.00	0.01	−0.06
Language skills	0.00	0.01	0.04	0.01	0.01	0.15#	0.01	0.01	0.14*	−0.01	0.00	−0.15#
Overcontrollers[a]	−0.43	0.14	−0.20**	−0.23	0.17	−0.11	−0.25	0.14	−0.14#	−0.04	0.05	−0.05
Undercontrollers[a]	−0.11	0.14	−0.06	−0.03	0.14	−0.02	−0.07	0.11	−0.04	0.10	0.05	0.15*
Structural characteristics												
Child–staff ratio	0.01	0.06	0.03	0.00	0.04	0.01	−0.04	0.04	−0.11	0.01	0.01	0.08
Work experience	0.01	0.01	0.10	0.00	0.01	0.04	0.01	0.01	0.08	−0.00	0.00	−0.13#
Number of children with immigration background per preschool class	−0.04	0.03	−0.14	−0.01	0.02	−0.01	−0.03	0.02	−0.14	0.00	0.01	0.05
Adequate equipment in the preschool class	0.00	0.19	0.00	−0.06	0.26	−0.03	0.05	0.16	0.03	0.09	0.06	0.11
R^2 (R^2 adjusted)	0.13	(0.07)		0.16	(0.10)		0.19	(0.13)		0.15	(0.09)	
F	1.80#			3.88***			3.72***			2.27*		
ΔR^2	0.08*			0.14***			0.10***			0.12**		

$N = 231$; B = unstandardized regression coefficient; SE = clustered robust standard error; β = standardized regression coefficient.

[a] The reference category is resilients.

#$p < 0.10$, *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

TABLE 4 Prediction of relationship quality through professional competencies.

Predictors	Teacher−child closeness			Teacher−child conflict		
	B	SE	β	B	SE	β
Step 1						
Professional competencies						
Beliefs on self−education	−0.03	1.05	−0.00	0.25	1.05	0.03
Beliefs on co−construction	0.30	0.96	0.02	−1.70	0.86	−0.12[#]
Beliefs on instruction	−0.81	0.52	−0.10	0.66	0.55	0.08
Work engagement	2.48	0.71	0.35***	−0.42	0.65	−0.06
Self−efficacy	0.36	0.97	0.03	−2.27	1.02	−0.21*
R^2 (R^2 adjusted)	0.15	(0.13)		0.09	(0.07)	
F	3.68**			1.77		
Step 2						
Professional competencies						
Beliefs on self-education	−0.30	0.88	−0.03	0.04	0.80	0.00
Beliefs on co-construction	0.48	1.06	0.03	−2.11	0.94	−0.15*
Beliefs on instruction	−0.72	0.45	−0.09	1.00	0.41	0.13*
Work engagement	1.58	0.70	0.23*	−0.27	0.59	−0.04
Self-efficacy	1.70	0.94	0.15[#]	−2.30	1.01	−0.21*
Child characteristics						
Gender (0 = girls, 1 = boys)	−0.91	0.57	−0.08	0.20	0.52	0.02
Age (in months)	0.18	0.08	0.14*	−0.14	0.09	−0.11
Language skills	0.03	0.04	0.05	−0.10	0.04	−0.17*
Overcontrollers[a]	−6.04	1.06	−0.44***	1.39	0.95	0.10
Undercontrollers[a]	−1.63	0.77	−0.13*	4.45	0.88	0.36***
Structural characteristics						
Child−staff ratio	−0.42	0.24	−0.15[#]	0.21	0.25	0.07
Work experience	−0.04	0.04	−0.07	–0.04	0.04	−0.08
Number of children with immigration background per preschool class	0.06	0.14	0.04	0.13	0.10	0.09
Adequate equipment in the preschool class	0.52	1.00	0.04	0.74	0.70	0.05
R^2 (R^2 adjusted)	0.36	(0.32)		0.29	(0.24)	
F	7.04***			5.58***		
ΔR^2	0.21***			0.20***		

N = 225; B = unstandardized regression coefficient; SE = clustered robust standard error; β = standardized regression coefficient.

[a] The reference category is resilients.

[#] $p < 0.10$, * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

teacher–child relationships in preschools in Austria. After controlling for child characteristics and structural characteristics, mixed findings were obtained. There were some statistically significant or tendentially significant associations with task orientation, conflict interactions, teacher–child closeness, and teacher–child conflict but no associations with peer interactions.

Interaction quality

Teacher interactions

We did not find statistically significant associations between preschool teachers' beliefs on self-education, co-construction and instruction, and teacher interactions. Although educational beliefs

are considered to filter, frame, and guide pedagogical activities (Fives and Buehl, 2012), it must be also noted that research on educational beliefs and interaction quality is not consistent with studies revealing no influence of preschool teachers' educational beliefs on interactional processes in preschools (Kluczniok and Roßbach, 2014). In this regard, the results of the present study fit with the inconsistent research landscape. We also did not find associations between preschool teachers' work engagement, self-efficacy, and teacher interactions. This pattern of findings deviates from previous research, which found positive associations between preschool teachers' work engagement (Penttinen et al., 2020; Soininen et al., 2023) and self-efficacy (Jennings, 2015; Hu et al., 2021; Wolstein et al., 2021) and the quality of interactions in preschools. An explanation for the null findings

may lie in the inCLASS, which primarily focuses on children's interactions with preschool teachers and not vice versa as many other instruments focusing on interaction quality do (Schmidt et al., 2018). This could probably explain why no associations were found.

Peer interactions

We did not find any associations between preschool teachers' educational beliefs, work engagement, self-efficacy, and the quality of peer interactions. It could be argued that null findings are probably not surprising because children's interactions with peers are in focus rather than interactions with preschool teachers. Furthermore, reference could be made to the specificities of the inCLASS, which focuses on the children's perspective on interaction quality and less on preschool teachers. However, this does not mean that preschool teachers do not play an important role in fostering children's interaction with peers. Research suggests that preschool teachers should use scaffolding (based on Vygotsky; see Bodrova and Leong, 2018) to facilitate children's interactions with peers (Acar et al., 2017) and should engage children in cognitively stretching "high-yield" activities (Bruner, 1980; Kontos and Wilcox-Herzog, 1997) to promote peer interactions (Smidt and Embacher, 2020). Previous findings from Austria indicate that the potential in this respect has not yet been fully tapped (Smidt and Embacher, 2020).

Task orientation

Preschool teachers' endorsement of instruction was lower on average compared with self-education and co-construction, as **Table 1** illustrates (see Schmidt and Smidt, 2021 and Mackowiak et al., 2022 for similar findings). However, it was positively related to children's task orientation, whereas educational beliefs on co-construction revealed a negative association with task orientation. No effects were found for beliefs on children's self-education. The positive effect of beliefs on instruction is reasonable because it can be assumed that an endorsement of instruction corresponds with preschool teacher-directed activities with clear learning goals (Schmidt and Smidt, 2021). Preschool teacher-led activities were found to be positively related to the development of children's academic skills (de Haan et al., 2014; Goble and Pianta, 2017), and previous research also indicates that preschool teacher-led activities may reduce children's off-task behavior (Rimm-Kaufman et al., 2005), a finding that fits with the present study. This is also true for the null finding regarding the beliefs on self-education, which corresponds with the expectation that preschool teachers endorsing self-education would tend to be reserved in practicing teacher-directed activities with clear learning goals (Schmidt and Smidt, 2021).

Some researchers suggest that a strong focus on children's self-education and reservation of preschool teachers can be an issue because concerns have been expressed that the children who are most in need of support, targeted stimulation, and active assistance could be disadvantaged (Grell, 2010). The interpretation of the negative association between co-construction beliefs and children's task orientation is much less clear as one would expect the opposite pattern of results (Winsler and Carlton, 2003; Bodrova and Leong, 2018). An explanation may lie in

a lack of clarity on the part of the preschool teachers on how co-construction can be implemented to support children's task orientation. Some research has revealed a high overlap ($r = 0.59$) between beliefs on co-construction and self-education (Schmidt and Smidt, 2021), whereas other findings suggest that preschool teachers do not rely on co-construction but on self-education (Mackowiak et al., 2022). These somewhat "hazy" findings might indicate a conceptual ambiguity of co-construction and self-education that preschool teachers probably face. Findings showing that cognitively stimulating learning support for children by preschool teachers is hardly implemented in everyday preschool life (Schmidt and Smidt, 2021) can also be interpreted in this direction.

We did not find any associations between preschool teachers' work engagement and self-efficacy and the quality of interactions in terms of children's task orientation. These patterns of findings deviate from previous research, which found positive associations between preschool teachers' work engagement and interaction quality (Penttinen et al., 2020; Soininen et al., 2023) and preschool teachers' self-efficacy and interaction quality (Jennings, 2015; Hu et al., 2021; Wolstein et al., 2021). However, in all of these studies, interaction quality was examined with the Classroom Assessment Scoring System (CLASS; Pianta et al., 2008), which also comprises interaction quality in terms of time on tasks (classroom organization) but focuses much more strongly on the preschool teacher. Thus, reasons for the lack of findings may lie in the measurement of the inCLASS.

Conflict interactions

Regarding conflict interactions, the only statistically significant association was found with preschool teachers in terms of work engagement. There were no statistically significant findings regarding preschool teachers' beliefs and self-efficacy. The most obvious explanation for the extensive lack of associations is probably the small variance of the conflict interaction domain (see **Table 1**). There is simply very little variance that can be explained at all. Indeed, the inCLASS factor conflict interactions is viewed critically due to the lack of variance and other measurement problems (von Suchodoletz et al., 2015; Slot and Bleses, 2018; Smidt and Embacher, 2021). There is one exception: we found a positive association between work engagement and conflict interactions (higher extent of conflicts). One possible explanation could involve "absorption," which is a characteristic of work engagement and means that people are immersed in their work (Bakker, 2011). The findings from our study could imply that preschool teachers with higher work engagement are probably less aware of the (few) conflictive interactions of the children with their peers, with themselves, and in terms of difficulties in behavior control as they are immersed and engaged in their work and different tasks. This should be explored in more detail in future studies.

Relationship quality

Teacher−child closeness

Although educational beliefs of teachers have been considered to be important for the formation of teacher−student relationships

(Myers and Pianta, 2008), empirical research is sparse and provides no clear evidence for associations between preschool teachers' educational beliefs and relationship quality (Mashburn et al., 2006; Hamre et al., 2008). The present study points in the same direction since preschool teachers' professional competencies in terms of beliefs on self-education, co-construction, and instruction did not predict teacher–child closeness. One explanation for the lack of findings in the present study and in previous research may lie in the nature of educational beliefs, which have been referred to as a "messy" construct (Fives and Buehl, 2012, p. 471) because they are difficult to define and conceptualize.

Preschool teachers' work engagement was positively associated with teacher–child closeness. Although referring to interactions instead of relations, previous research indicating positive associations between work engagement and interaction quality between preschool teachers and children (Penttinen et al., 2020; Soininen et al., 2023) could probably be tentatively connected to the findings of the present study. Following the job demands–resources model (e.g., Bakker, 2011; Bakker et al., 2014; Bakker and Demerouti, 2017), associations can also be theoretically expected as it is assumed that higher work engagement corresponds with positive emotions such as joy and enthusiasm, which may positively affect relationships with children. However, empirical findings on relations between preschool teachers' work engagement and teacher–child closeness seem to be sparse. In addition, preschool teachers' self-efficacy had a significant positive association with teacher–child closeness (only $p < 0.10$). This finding is generally in line with previous research (Mashburn et al., 2006; Hamre et al., 2008) and underpins the still quite limited empirical findings on the importance of preschool teachers' self-efficacy for the quality of teacher–child relationships (e.g., Chen and Phillips, 2018).

Teacher–child conflict

A higher endorsement of educational beliefs on instruction corresponded with a perception of preschool teacher–child relationships as more conflicted. A higher endorsement of beliefs on co-construction corresponded with a perception of these relationships as less conflicted. One explanation could be that resentment and resistance among children could arise from an endorsement of instruction, which corresponds with teacher-directed activities in which the child has little opportunity to have a voice (Schmidt and Smidt, 2021). This resentment and resistance might be manifested in preschool teachers' perceptions of relationships with children as more conflicted. If this interpretation is true, the effect of beliefs on co-construction also seems reasonable because in educational practice, children might be more actively involved, they might have more opportunities to have a voice, and preschool teachers might be in a dialogue with the children and provide them with targeted assistance ("scaffolding") (Bodrova and Leong, 2018; Schmidt and Smidt, 2021).

There were no significant associations between preschool teachers' work engagement and teacher–child conflict. This null finding seems surprising because according to the job demands–resources model (e.g., Bakker, 2011; Bakker et al., 2014; Bakker and Demerouti, 2017), one would expect that high work engagement, which is related to positive emotions such as joy and enthusiasm, would lead to less conflictive relationships between preschool teachers and children, at least in the perception of the preschool teacher. In any case, this finding cannot be readily explained and

would need further investigation in additional studies. A different picture emerges with regard to preschool teachers' self-efficacy, which was negatively related to teacher–child conflict (i.e., higher self-efficacy led to less conflicted relationships between preschool teachers and children in the perception of preschool teachers). This finding fits with previous research where the same pattern of results was reported (Hamre et al., 2008). It also adds additional evidence to the research on preschool teachers' self-efficacy for the quality of teacher–child relationships (e.g., Chen and Phillips, 2018).

Control variables

It is important to note that the findings on associations between different components of professional competencies, interaction quality, and relationship quality hold after accounting for powerful control variables, particularly in terms of child characteristics that are related to aspects of interaction quality and/or relationship quality. These findings generally correspond with previous research (e.g., Rudasill and Rimm-Kaufman, 2009; Booren et al., 2012; Slot and Bleses, 2018; Smidt and Embacher, 2023a). However, structural characteristics (see Mashburn et al., 2006; Slot et al., 2015; Smidt and Embacher, 2023b for further findings) were shown to be relatively poor predictors of interaction quality and relationship quality.

Study limitations and implications for research and practice

When interpreting the results, several limitations must be taken into account. First, it must be considered that interaction quality was assessed at the individual child level with the inCLASS. Although the inCLASS has the advantage of focusing on the interactional experiences of individual children, a drawback is the narrow focus on the preschool teachers and their pedagogical activities. If interaction quality had been captured at the preschool class level with a stronger focus on preschool teachers, some deviating findings might have emerged. To include preschool teachers' perspectives in the study, the STRS was used to assess teacher–child relationships. Second, preschool teachers' self-efficacy was captured as general self-efficacy, which is somewhat different from other studies that focused more on teaching self-efficacy (e.g., Mashburn et al., 2006; Hu et al., 2021). However, it is assumed that general self-efficacy beliefs have a tendency to "spill over" into specific situations (e.g., Chen et al., 2001). Third, ceiling effects cannot be excluded as the expression of several professional competencies (e.g., beliefs on co-construction and self-efficacy) was relatively high. High levels in respect to beliefs on co-construction can be explained by the high value placed on co-construction in the Nationwide Framework Curriculum for Austrian ECEC Services (Charlotte Bühler Institut, 2009). High levels of preschool teachers' self-efficacy have also been found in other studies (e.g., Smidt et al., 2018). Fourth, parts of the teachers' beliefs were measured about half a year earlier due to the study design. The beliefs collected half a year later were used due to the better response (thus achieving a larger number of cases). As the time frame consisted of only a few months, and

educational beliefs can be considered relatively stable (Fives and Buehl, 2012), it is assumed that this should not impact the results. Fifth, some measures had low reliability (e.g., task orientation $\alpha = 0.58$; beliefs on co-construction $\alpha = 0.52$), which is possible due the low number of items among these subscales (Cortina, 1993). Although low reliability may not be an obstacle for the usage of scales in every case, it has to be considered when interpreting findings as low reliability can attenuate associations between variables (Schmitt, 1996). Sixth, a limitation is that the considered control variables may be conceptualized differently depending on the study. For example, work experience may refer to the time spent in the current preschool or to the duration of experience across different workplaces. Similarly, the child–staff ratio may refer to preschool teachers and assistant staff or to preschool teachers only. This makes it difficult to compare the results with those of other studies. Seventh, it has to be taken into account that data were collected within one federal state of Austria. As the preschool system in Austria differs from other countries (see the section on "Preschool education in Austria"), transferability to other countries' contexts will probably be limited. When comparing the current study findings with previous ones, it also has to be taken into account that not only different cultural contexts (Pastori and Pagani, 2017) but also different methodological procedures (e.g., different measurement instruments) with associated methodological problems (e.g., problems with factorial validity, see Smidt and Embacher, 2023c) may influence study results and make comparability more difficult. Despite these limitations, the study provides relevant findings that can be integrated into the international research context.

Although the current findings are somewhat mixed and not always easy to interpret, the study shows that aspects of professional competencies are predictive of the quality of interactions and relationships in preschool, even after consideration of relevant control variables. This leads to several implications, especially in the context of the vocational training and professional development of preschool teachers. In light of the study results, it seems to be relevant that preschool teachers become aware of the importance of their professional competencies for their pedagogical activities and have the possibility to reflect them (e.g., regarding their beliefs on the support of children). Particular focus should be placed on beliefs on co-construction and their implementation in practice. Despite preschool teachers highly agreeing with beliefs on co-construction, the study results suggest that the potential to support children in their learning remains untapped. Furthermore, professional competencies in terms of self-efficacy could be enhanced—for example, through mastery experiences (e.g., if preschool teachers receive support in mastering demanding situations) or verbal support (e.g., positive feedback from colleagues) (Bandura, 1977). With regard to work engagement, several job resources (e.g., job security and social support from colleagues) and personal resources (e.g., optimism) are relevant to engagement at work (Bakker, 2011). For further studies, it would be interesting to examine whether results differ when using other instruments on the level of the preschool class and focus on the preschool teacher for

the assessment of the interaction quality. Furthermore, additional professional competencies (e.g., knowledge) should be considered as possible predictors of interaction quality and relationship quality. In future studies, it would also be of interest to take a closer look at several other teacher characteristics (e.g., their personality), which are likely to moderate the effects of professional competencies and explain some of the inconsistent effects.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

Ethical review and approval was not required for the study on human participants in accordance with the local legislation and institutional requirements. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

Both authors contributed equally to the work (conception of the study, writing the first draft, data analyses, and editing the manuscript) and approved it for publication.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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Supporting second language acquisition of bilingual preschool children through professionalization of caregivers in specialized preschool programs

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The aim of the present study was to investigate the effectiveness of a training program on language support strategies and dialogic reading for caregivers working in specialized preschool programs. These programs serve children without a regular childcare place who grow up with one or more languages other than German as the environmental language. Recent studies investigating the development of children attending these programs found only moderate improvements in German receptive language skills, while language support quality of the programs was rated as average. We assessed receptive second language competencies in vocabulary and grammar of $n=48$ children and language support competencies of $n=15$ caregivers using an interventional pre-posttest design. Receptive vocabulary skills of children supported by trained caregivers (intervention group) were compared to children supported by untrained caregivers (control group, $n=43$). We found that both children's and caregivers' competencies increased from pre- to posttest, whereas the control group's receptive vocabulary skills did not increase noticeably. The caregivers' language support competencies influenced the increase of children's receptive grammar but not vocabulary skills. The comparison between the intervention group and control group consistently showed no effect of group membership on children's receptive vocabulary acquisition over time. Since the control group data came from a secondary analysis, only receptive vocabulary skills could be compared. The preliminary results of our study suggest that a caregivers' training on language support strategies and dialogic reading in everyday educational situations support bilingual children's grammar acquisition.

KEYWORDS

professionalization, language support, early education, dialogic reading, bilingual children, specialized preschool programs

1. Introduction

Worldwide, there is an increasing number of children growing up bilingually. In Germany, 40% of all children under the age of six have a migration background (Autorengruppe Bildungsberichterstattung, 2022). Half of these children grow up with one or more languages other than German (Autorengruppe Bildungsberichterstattung, 2022). Bilingual children who receive little or no input in their second language [L2, German] during preschool years face the challenge of acquiring these language skills parallel to the academic skills required in schools when entering the new and unfamiliar school environment (Michalak et al., 2015). Therefore, children with a migration background are more often faced with an educational disadvantage compared to children without migration background (Tienda and Haskins, 2011; Forrell and Bellenberg, 2022). Although it has been demonstrated that low linguistic performance in the environmental language is associated with educational disadvantages (Ballantyne et al., 2008), it has been shown that (a) bilingualism has no negative influence on cognitive development (e.g., Bialystok et al., 2012; Wimmer and Scherger, 2022) and (b) low language achievements and disadvantages in the educational system seem more likely linked to low socioeconomic status [SES] (Pace et al., 2017; Voltmer et al., 2021; Stitzinger, 2022). In Germany, for instance, children with a migration background are three times more likely to grow up in a family at risk of social disadvantage and six times more likely to experience educational disadvantages compared to children without a migration background (Autorengruppe Bildungsberichterstattung, 2022).

Moreover, in Germany, almost one fifth of all children with a migration background does not enroll into daycare before entering school (Statistisches Bundesamt, 2021) due to a lack of childcare places. This is particularly problematic since longer daycare attendance is linked to better language outcomes of bilingual children in the environmental language (Ballantyne et al., 2008; Becker, 2010; Giesen et al., 2013). In order to promote social participation for bilingual children, it is important to provide them with high-quality L2 input before they enter school. Therefore, there are additional specialized early childhood development [ECD] programs for preschool children outside of regular daycare to compensate for the shortage of childcare places. These programs aim at a familiarization with basic cultural, school-relevant techniques prior to school start, above all the promotion of language skills. It has been shown that the quality of early childhood education [ECE] is decisive for how much children benefit from attending preschool (NICHD Early Child Care Research Network and Duncan, 2003).

In the present study, we implemented language support into these specialized ECD groups through video-based training of the caregivers working in these programs. Our aim was to investigate the effectiveness of a video-based training focusing on so-called language support strategies [LSS] used in daily routines such as dialogic reading [DR] and other highly structured everyday situations. As knowledge and skills are considered prerequisites for the performance of language support, we assessed language support knowledge and skills of participating caregivers using a standardized questionnaire. Furthermore, we assessed language outcomes of the promoted children within an interventional pre-posttest control group design.

1.1. Language Support and L2 Acquisition of Recently arrived immigrant children attending specialized ECD programs

Recent evidence on the links between language support and L2 acquisition among bilingual children with low length of exposure [LoE] to German comes from an investigation of specialized ECD groups. In response to the increased influx of immigrant and refugee populations to Germany in 2016, the federal government has started subsidizing specialized ECD programs for recently arrived immigrant children who could not enroll into other forms of daycare (Busch and Leyendecker, 2019). In a series of investigations, Busch and colleagues examined the implementation and quality of language support in the specialized ECD programs (Busch et al., 2023). The language support was better than in regular ECE groups according to a standardized rating scheme administered by licensed observers (Classroom Assessment Scoring System, Pre-Kindergarten; La Paro et al., 2002; Pianta et al., 2008), but still within the lower average range. Surprisingly, caregivers in the specialized programs had heterogenous ECE professionalization with more than 20 percent not reporting any ECE-related qualification. Compared to regular daycare, caregiver-child ratio in the specialized programs was better (1 caregiver for 3–4 children per group), frequency of children's program attendance was lower (e.g., 4–5 days weekly with 3 h per day) and the caregivers were, on average, highly involved.

In a subsequent study, Busch and colleagues investigated the links between children's German language acquisition and children's attendance of the specialized ECD programs (Busch et al., 2021). The authors overall obtained inconsistent results. As expected, the recently arrived immigrant children had German language skills on very low levels. Longer periods of program attendance were linked to better German language skills and the authors observed within-child language improvements throughout a 5-month period of attendance. However, those children attending the specialized ECD groups did not show advantages over a control group of recently arrived immigrant children without experiences of formalized ECE. The work by Busch and colleagues thus provides preliminary evidence that caregivers with varying ECE professionalization might not apply effective language support to bilingual children. Still, their work has some decisive limitations. The methodological approaches were correlative and children of the control group design were slightly older than the group of children attending the specialized ECD groups. Further research is warranted to clarify the impact of caregivers' daycare-embedded language support competencies and knowledge on the L2 acquisition among recently arrived immigrant children. Such research should especially ensure (a) staff's professionalization regarding the improvement of language support competencies to foster language acquisition (i.e., LSS) through intensive training programs, (b) employ a research design that directly links staff's knowledge and competencies on language support with child language acquisition, and (c) use control groups to verify the results.

1.2. Language support strategies and dialogic reading

LSS have their origin in early parent–child communication. Parents and caregivers intuitively apply certain techniques in their

child-directed speech that are intended to support the child's language acquisition. For example, in the first 2 years of life, parents support their children's language acquisition especially through repetition or simplification of their speech and through nonverbal communication (Snow, 1972). Whitehurst and colleagues initially described these strategies for use in language promotion and therapy contexts and summarized them into two central components, "PEER" and "CROWD" (e.g., Lonigan and Whitehurst, 1998). The acronym PEER (prompting, evaluating, expanding, repeating) describes the four key language support strategies. Prompting includes initiating language development strategies, i.e., primarily questions that are intended to stimulate the child to speak. The different types of prompting are summarized under the acronym CROWD (completion, recall, open-ended, wh-, and distancing questions). Reactive strategies (evaluating, expanding and repeating) are used to address, expand and repeat child utterances in order to provide the child with content feedback on different linguistic domains (Towson et al., 2020).

Many studies have found a positive effect of the use of LSS on children's language outcomes. For example, the use of questioning strategies (open-ended, wh-, and distancing questions) has been shown to positively influence the verbal, cognitive and social skills of preschool children in general (Gunn and Hruska, 2017). The use of elicitations in small group settings, moreover, has been found to be supportive on children's oral language acquisition (Hadley et al., 2022). However, recent studies have shown that the frequency of strategy usage in ECE institutions depends on how much the pedagogic situation is structured (Wildgruber et al., 2016; Beckerle et al., 2018; Burke Hadley et al., 2022) Further, it has been shown that caregivers and teachers underutilize LSS (Siraj-Blatchford et al., 2002; Beckerle et al., 2019). Thus, the integration of LSS into DR situations that are particularly structured is especially promising (Kammermeyer, 2019). DR is based on the following fundamental principles: "(i) evocative techniques that encourage the child to actively participate in reading and practice language, (ii) the use of informative feedback for the child regarding correct language use and (iii) progressive change where the adult adapts their reading style to the child's developing linguistic abilities" (Pillinger & Vardy, 2022, p. 3).

Recent studies could not find a greater benefit from DR-interventions over other language support approaches, as the effect of DR was strongly dependent on the implementation fidelity (Ennemoser, 2017), i.e., on the actual extent to which professionals implemented LSS in DR interventions. However, in former literature, the effectiveness of DR-interventions is uncontroversial as several studies found positive effects of DR on children's language outcomes (Pillinger and Vardy, 2022). For instance, there is evidence for positive effects of DR on young children's narrative comprehension and nonword repetition skills (Holt and Asagbra, 2021). Neuman and Kaefer (2018) found positive effects on expressive, but not on receptive vocabulary using a pre-posttest control group design, although change in standardized scores remained insignificant. Effects are also strong with regard to bilingual children (Ennemoser et al., 2013) and children at risk for developmental language disorder (Holt and Asagbra, 2021). Furthermore, DR-interventions have the advantage of being strongly structured and efficient. DR is easy to implement and requires little preparation, is flexible in its implementation and adaptation of the linguistic content to the needs and interests of the children (Sigel and Inckemann, 2017) and is therefore of great benefit for professionalization programs.

1.3. Professionalization of caregivers in early childhood education

Among culturally and linguistically diverse children, previous ECE-based work has supported links between children's L2 acquisition and caregivers' language support. Moreover, the previous work has also challenged the findings by Busch and colleagues regarding the relevance of caregivers' professionalization for the realization of language support in ECE. In their meta-analysis, Fitton et al. (2018) reported an overall positive effect of DR on bilingual children's language outcomes, whether carried out by external experts or through training of the caregivers working in ECE. However, in contrast to additive language support interventions, integrated interventions implemented through professionalization of caregivers have the advantage of being highly frequent in everyday pedagogical situations (Kammermeyer, 2019). Thus, in general, effects of integrated language support could be reported, whereas effects of additive language support remained inconsistent (Egert and Hopf, 2016). Therefore, our goal was to implement LSS-based language support into ECD-groups through training of the caregivers.

In the recent years, many (inter-)national training programs for caregivers and teachers on the use of DR or LSS in general have been developed and evaluated (e.g., Neuman and Kaefer, 2018; Kammermeyer et al., 2019; Towson et al., 2020; Voltmer et al., 2021). Most studies investigated effects of the training programs only on children's language acquisition for several language domains, mostly focused on expressive language skills. Thus, Blatter et al. (2020) conclude a positive effectiveness of different German training programs on expressive language outcomes of bilingual children and children in need of language support. In contrast to that, Voltmer et al. (2021) found effects of a caregivers' training in LSS on monolingual and bilingual children's morphological and syntactic language performance, but not on receptive and expressive vocabulary. So far, the investigation of trained caregivers' competencies has been underrepresented in international studies evaluating training program effectiveness. The few studies available investigated the effectiveness of training programs on the usage of LSS using video analysis (e.g., Girolametto et al., 2003; Jungmann et al., 2013; Kammermeyer et al., 2019) and found positive effects on the language supportive interaction between children and caregivers.

Other studies from German-speaking countries set their focus on the standardized assessment of caregivers' knowledge and skills rather than on observing the performance of language support (e.g., Roth et al., 2015; Beckerle et al., 2019; Lemmer et al., 2019), as different types of knowledge are considered prerequisites for, for example, the quality of teaching and students' competencies (e.g., Yang et al., 2020). Models exist describing the competencies required for successful language support. For example, Hopp et al. (2010) conducted a "(psycho) linguistically oriented model" that aims to specify "competence criteria for language intervention based on psycholinguistic research" (p.609). Hopp et al. (2010) assume that caregivers have to be able to plan and reflect language support situations based on assessment or observation of linguistic skills of the children and theoretical knowledge about language acquisition in terms of the zone of proximal development (Vygotsky, 1978). Therefore, the model describes (1) theoretical *knowledge* about language acquisition, (2) *skills* needed to (3) *perform* language support. Accordingly, and in line with current research, both professional knowledge and skills of caregivers and teachers are

considered prerequisites for the successful implementation of language support (Jungmann and Koch, 2017). Therefore, linguistically oriented models such as that developed by Hopp et al. (2010) provide a basis for planning specific training programs for language support. Training programs administered in studies investigating knowledge and skills focused on different content, i.e., on the usage of LSS (Beckerle et al., 2019) or on linguistic and practical knowledge (Roth et al., 2015; Lemmer et al., 2019). Overall, these studies found positive effects of intervention programs on the caregivers' knowledge and theoretical competencies (Roth et al., 2015; Beckerle et al., 2019). For example, Roth et al. (2015) investigated caregivers' linguistic and practical knowledge about language support and assessment before and after 12 days of training, which took place within a 10-month qualification phase. The authors found a significant increase of caregivers' knowledge in both components, although lacking the comparison with a control group.

However, Fitton et al. (2018) criticize the lack of studies investigating the relation between effects on caregivers' competencies and children's outcomes and therefore an absence of evidence regarding competencies and knowledge needed to successfully implement language support. Only few studies investigated both caregivers' and children's competencies and found mostly positive effects on both areas (Buysse et al., 2010; Lemmer et al., 2019; Towson et al., 2020). In a recent study, Lemmer et al. (2019) assessed bilingual children's expressive language outcomes and their caregivers' language support competencies in a pre-posttest control-group-design before and after a caregiver training. The authors found improvements in children's expressive sentence structure and caregivers' knowledge about language support, but only when the interaction of time of measurement and group was considered. The distinction by group alone did not reveal significant differences. This finding indicates that caregivers and children in the experimental group improved their competencies more than participants in the control group.

However, Pillinger and Vardy (2022) and Fitton et al. (2018) point out that positive effects of training measures on children's language outcomes often have to be interpreted cautiously, since most studies did not include control groups. In sum, most studies could demonstrate positive effects of caregivers' training in LSS on children's language acquisition and, if examined, on caregivers' competencies. There are only a few studies regarding (a) the relation between effects on caregivers' competencies and children's outcomes, (b) effects on L2 acquisition of bilingual children with low LoE, and (c) studies including control groups. Therefore, these topics remain research gaps.

1.4. Research questions and hypotheses

The goal of the present study was to successfully implement language support into specialized ECD programs and thus, to strengthen language competencies and educational opportunities of participating preschool children without a regular childcare place. Therefore, we investigated whether bilingual children with low LoE to German as their L2 benefit from a caregivers' training in LSS and DR. To follow this aim, we examined the following research questions:

(1) Do the children's receptive language scores (receptive vocabulary and grammar) differ from T_1 (before caregivers' training) to T_2 (after implementation of language support)?

(2) To what extent do the caregivers' language support knowledge and skills change from T_1 to T_2 and do they influence the children's receptive vocabulary and grammar skills?

(3) Do the children's receptive vocabulary skills differ from the ones of a control group of children who also visited ECD but without a caregivers' training?

Considering recent findings, we expected (a) a significant improvement in receptive language skills of children (e.g., Jungmann and Koch, 2017; Blatter et al., 2020), with major increases in receptive grammar (Voltmer et al., 2021). Furthermore, we expected (b) caregivers' language support knowledge and skills to increase after training and implementation of language support (Buysse et al., 2010; Lemmer et al., 2019; Towson et al., 2020). Understanding change on child-levels, we expected (c) caregivers' competencies to influence language scores of the children. We also expected (d) children supported by trained caregivers to outperform children of the control group (Lemmer et al., 2019).

2. Materials and methods

2.1. Participants and procedure

For the intervention group [IG], participants were recruited in 2022 from nine ECD groups in a western region of Germany. The initial sample consisted of 23 caregivers, who gave their consent of participating in the training program and the five-months intervention phase. The recruitment of participating children was conducted through recruiting caregivers. Seventy-six children were recruited for the IG, of whom 13 were excluded from the study because participants did not meet the inclusion criteria or did no longer attend the ECD group. In addition, data from 43 children from Busch et al. (2021) were used as a control group [CG]. Children in the CG attended ECD groups in 2017/18 with caregivers who did not complete a language support training. For both, IG and CG, inclusion criteria for participating children were the following: (1) children were in their last year before transitioning into school (2) children grew up bilingually[1] with German as their L2, (3) they predominantly spoke another language than German at home; regular exposure to German began by entering the ECD program, and (4) they did not attend daycare before entering the ECD program. The final sample of participants of the IG who took part in the tests on at least one measurement occasion consisted of $n = 54$ children and $n = 20$ caregivers. For overall analysis, we selected all participants who participated in both measurement occasions in at least one of the measures focused in this study ($n = 48$ IG-children, $n = 15$ caregivers, $n = 43$ CG-children), as participants with missing data have been

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1 De Angelis (2007) suggests distinguishing between bilingualism and multilingualism for various reasons. Since the inclusion criterion of our study includes bilingual as well as multilingual children and we only include one first language that the children speak most at home, in the following we use the term "bilingualism" as a broader definition including bi- and multilingual children (Butler, 2013).

TABLE 1 Sample characteristics of participating children.

Variable	Intervention group (n=48)	Control group (n=43)
Gender, H(%) female	20 (42%)	20 (47%)
Age (months), M(SD)	69.10 (4.75)	71.65 (10.96)
Heritage languages, H(%)		
Romanes	13 (27%)	–
Arabic	8 (17%)	–
Kurdish	5 (10%)	–
Spanish	4 (8%)	–
Turkish	4 (8%)	–
Somali	3 (6%)	–
Persian	2 (4%)	–
Other	9 (20%)	–
Region of origin[1], H(%)		
Southeastern Europe	–	22 (51%)
North Africa	–	9 (21%)
Middle-East	–	8 (19%)
Subsaharan Africa	–	1 (2%)
Unknown	–	3 (7%)
LoE to German, M(SD)	5.79 (5.22)	7.22 (4.13)

[1]Since the data come from two different projects, heritage language was assessed for the intervention group, whereas heritage regions were collected for the control group. LoE, length of exposure. Age and LoE in months. H, absolute frequency. %, percent.

TABLE 2 Sample characteristics of participating caregivers.

Variable	n=15
Gender, H(%) female	14(93%)
Age, M(SD)	39.8(13.66)
Educational background, H(%)	
Academic pedagogical	7(47%)
Non-academic pedagogical	5(33%)
Non-pedagogical	1(7%)
Teacher in-training	2(13%)
Work experience	8.47(6.86)

Age and work experience in years. H, absolute frequency. %, Percent.

excluded for main analysis. For demographic information on the final analysis sample see Tables 1, 2.

As CG and IG data were from two different projects, we inspected covariates descriptively and found no significant differences in the variables age and LoE using t-tests (age: $p=0.15$, LoE: $p=0.15$). The investigations on which the present study is based received a positive vote from the ethics committee of the TU Dortmund University. Children participated only after parents provided written informed consent. Study information and parental background questionnaires were translated into 15 heritage languages. To address our research goals, we chose a pre-post intervention study design. Figure 1 visualizes the process of the study. Assessments were conducted between January and July 2022 in two phases: initially at T_1 and again 5 months later (T_2). To additionally ascertain whether potential

changes that occurred are a direct result of the intervention, we used CG data from a project investigating receptive vocabulary skills of children also visiting ECD programs but without a caregivers' training (see Busch et al., 2021). We chose an inter-assessment interval of 5 months that was comparable to previous studies addressing the effectiveness of DR-based intervention (Pillinger and Vardy, 2022) and to the study by Busch et al. (2021) to compare our outcomes with a control group.

Eleven research assistants, all of whom (special) education students, were trained and supervised in child direct assessment procedures by the first and last author. At each measurement occasion, the respective child was tested in two sessions. Child direct assessments were administered with each child individually in separate rooms during ECD program hours and lasted around 30 to 45 min. Caregivers' language support competencies were assessed before the training in LSS and after implementation of the language support.

2.2. Intervention

Caregivers were trained aiming at the use of LSS and performance of language support, particularly in DR, through a 12-h video-based training program. The training was delivered online on three separate days due to distancing polices during the COVID-19 pandemic. The training program consisted of three main modules: (1) milestones of language acquisition in bilingual children, (2) LSS and (3) DR. Following the classification of Beckerle et al. (2020) and the two central components of LSS, *PEER* and *CROWD* (e.g., Lonigan and Whitehurst, 1998), the training program mainly included five LSS in two global areas: reactive LSS and initializing LSS. Table 3 summarizes LSS used in the training program.

First, on two consecutive training days, the participants were mainly informed about language acquisition, LSS and basic principles of DR. Therefore, participants attended a two-hour lecture on milestones in bilingual language acquisition. The input contained information about bilingual language acquisition in general, and specifically in the different linguistic areas (phonetics, vocabulary, morphology and syntax, pragmatics and phonological awareness) as well as basic information about developmental language disorder. Small tasks were administered during the input phase, e.g., participants were asked to analyze the function of different types of verbs in exemplary sentences during the input on syntactic development.

The second module consisted of a three-hour block on (a) key situations conducive to language support and (b) information on the five main LSS (corrective feedback, modeling, redirecting, parallel talking and questions). For example, participants were asked to discuss everyday pedagogical situations suitable for language support in small groups. Afterwards, small input phases were given for each LSS. In addition, the participants were given short tasks to work on in small groups to find suitable LSS for exemplary situations. For example, the participants discussed appropriate feedback or modeling strategies to respond to exemplary non-target child utterances using a worksheet with examples of children's expressions. Additionally, video material was provided to give examples of pedagogical situations suitable for language support (Baldaeus et al., 2021). The participants were asked to discuss the video examples and to evaluate the behavior of
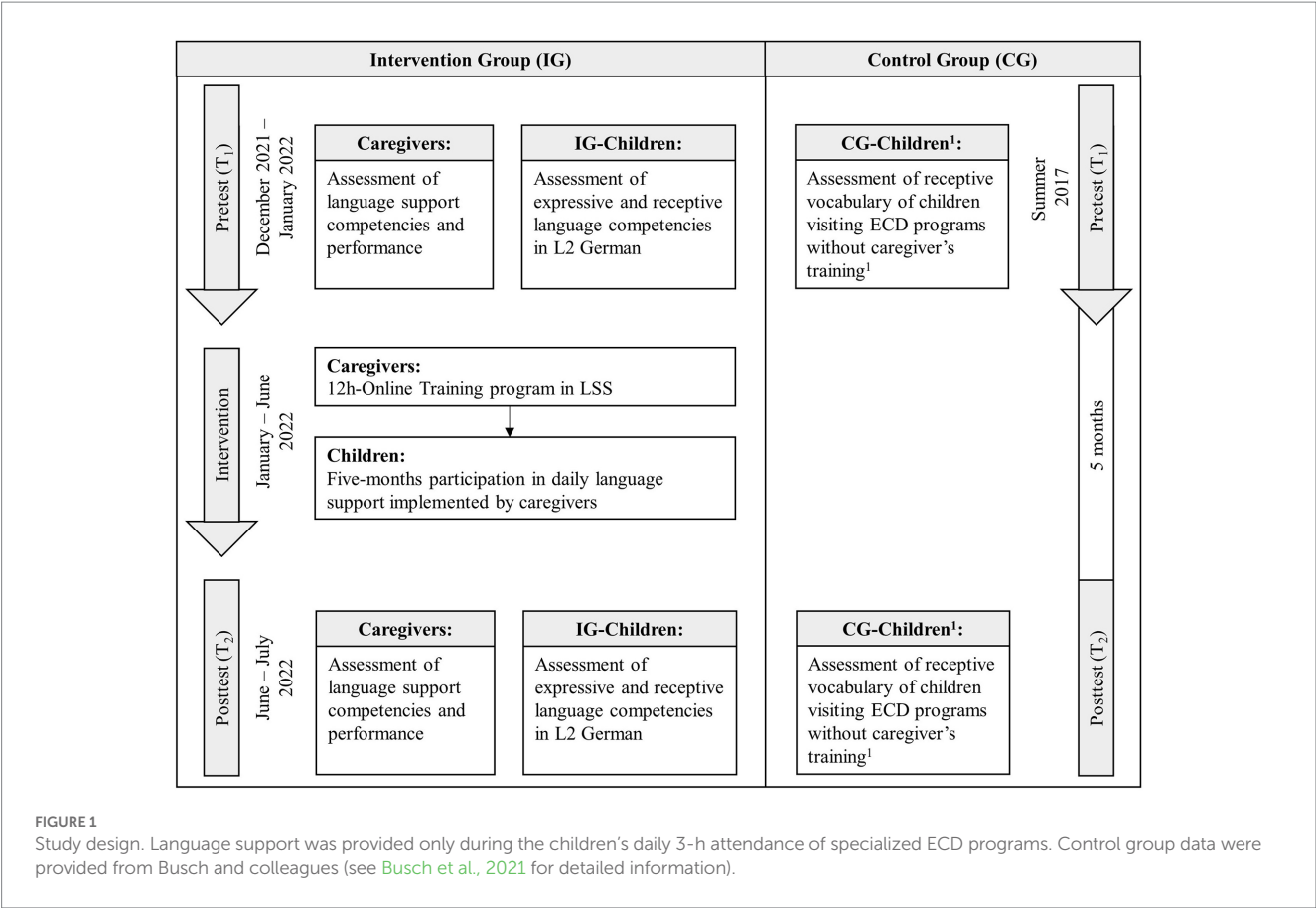
FIGURE 1
Study design. Language support was provided only during the children's daily 3-h attendance of specialized ECD programs. Control group data were provided from Busch and colleagues (see Busch et al., 2021 for detailed information).

TABLE 3 Language support strategies following the classification of Lonigan and Whitehurst (1998) and Beckerle et al. (2020).

Language support strategy	Definition	Examples[1]
Reactive LSS		
Corrective feedback (evaluating/repeating/completion)	Indirect evaluation of an incorrect child's utterance in different linguistic areas (e.g., phonologic, semantic, morphologic)	Child: "There is a mouse." Adult: "Yes, there is a rabbit!" (Semantic Corrective Feedback)
Modeling (expanding)	Indirect modification or extension of a child's utterance in different linguistic areas (e.g., phonologic, semantic, morphologic)	Child: "There is a rabbit." Adult: "Yes, there is a rabbit. The rabbit has long ears." (Semantic-syntactic Modeling)
Redirect (recall)	Returning a question of the child	Child: "What is that?" Adult: "Yes, what could that be?"
Initiating LSS		
Parallel talking	Accompanying actions and thoughts with language	"What color do I want to paint my house? Now I take the red crayon for the roof."
Questions (prompting)	Open-ended questions, wh-questions, distancing questions	"Why do you think the boy is mad?"

[1]Own examples based on the definition of Lonigan and Whitehurst (1998) and Beckerle et al. (2020).

the caregivers and the LSS used in the videos. At the end of the second training day, an introduction to DR was given (1 h) using own video examples created to contrast good and poor practice for the use of LSS in DR situations. Afterwards, participants were asked to transfer their acquired knowledge into practice by implementing one DR-situation using LSS in their pedagogical work over the following days. After a three-day break for testing DR and LSS, the third day of training (4 h) was devoted to evaluate the first implementations into practice. Additionally, planning steps of DR and the adaptive use of LSS in DR were focused. Input was also given on phonological awareness and appropriate activities to promote the different language domains in everyday situations. Caregivers were instructed to regularly apply LSS in highly structured situations in their everyday pedagogical work. Additionally, during the five-month intervention phase, caregivers were regularly sent material packages with selected books and games suitable for language support.

2.3. Measures

Children's L2-competencies were assessed using various standardized and informal diagnostic instruments for several language domains. Currently, there are no standardized language assessment tools available for children with L2 German and low LoE. Due to this lack of adequate measures for our population and following the suggestions by Rothman et al. (2022), we primarily used tasks that were normed for monolingual children interpreting raw scores rather than T-values for the present population. Additionally, we assessed

caregivers' language support competencies and performance. The assessment of language support competencies is described below, whereas the evaluation of language support performance using video analysis (following Beckerle et al., 2020) is still ongoing.

To assess children's receptive and expressive vocabulary, we used two standardized German measurements [PDSS (Patholinguistic diagnostic in developmental language disorders; Kauschke and Siegmüller, 2009) and PPVT-4 (Peabody Picture Vocabulary Test; Lenhard et al., 2015)] and additionally a test for the assessment of specific vocabulary addressed during language support. To test children's grammar skills, we used the TROG-D (German version of the Test for Reception of Grammar; Fox-Boyer, 2020) and spontaneous language samples by calculating specific grammar scores following the proceeding of Kauschke et al. (2022). To assess children's narrative skills, we utilized the German version of the Multilingual Assessment Instrument for Narratives (MAIN; Gagarina et al., 2012). For assessment of phonological knowledge and awareness, we used the QU-NWR (LITMUS Quasiuniversal Nonword Repetition Tests; described in Grimm, 2022) and the German version of the Illinois Test of Psycholinguistic Abilities (P-ITPA; Esser and Wyschkon, 2010). In this study, we only report results for receptive vocabulary and receptive grammar skills. For the CG, only receptive vocabulary data is provided. Since we conducted tests which were normed for monolingual children, the comparison with the standardized T-values is ruled out. Raw scores were used as informative measures instead.

2.3.1. Children's receptive vocabulary

To assess children's receptive vocabulary in their second language, we used the German adaption of the Peabody Picture Vocabulary Test (PPVT-4; Lenhard et al., 2015). The test contains 228 items, presented each with three distractors in ascending order of difficulty within a set of 12 items, respectively. For each item, the child is asked to select the picture that matches the word spoken by the research assistant. The session is terminated if the child makes eight or more errors in an item set. The test is standardized and normalized for children from 3;0 to 16;11 years. Overall internal consistency of the PPVT can be interpreted as excellent with $\alpha = 0.97$.

2.3.2. Children's receptive grammar

To additionally assess children's receptive grammar skills in their L2 in the IG, we used the German adaption of the Test for Reception of Grammar (TROG-D; Fox-Boyer, 2020). The test measures the understanding of 21 German grammatical structures, each tested in a block of four items, using different stimuli. For each item, the child is asked to point to the picture representing the sentence spoken by the experimenter. The session is terminated if the child makes one or more errors in five consecutive blocks. The TROG-D is standardized and normalized for children from 3;0 to 10;11 years. Overall internal consistency of the TROG-D can be interpreted as excellent with $\alpha = 0.90$.

2.3.3. Caregivers' language support knowledge and skills

Assessment of theoretical and language support knowledge of the caregivers was conducted using the German SprachKoPF (Instrument for the standardized assessment of language support competence of pedagogical professionals; Thoma and Tracy, 2014). The SprachKoPF is an online questionnaire basing on the linguistic model for language support competence by Hopp et al. (2010). It assesses knowledge and skills of caregivers working in ECE. Linguistic knowledge (knowledge of different linguistic areas and language acquisition) and practical knowledge (knowledge of language assessment and support) are tested in 35 items using multiple choice and assignment tasks. Additionally, skills are tested using 18 tasks that describe concrete situations with case examples and videos. Participants can achieve an overall score between 0 and 1. Due to the guessing adjustment, individual negative values may appear. The test does not contain standard values. Internal consistency for the knowledge-component can be interpreted as good with $\alpha = 0.89$, but is unsatisfactory for the skills-component with $\alpha = 0.64$. Overall internal consistency for the total score can be interpreted as excellent with $\alpha = 0.9$.

2.4. Data analysis

2.4.1. Pre-analysis

Statistical analysis was performed using R (R Core Team, 2022, version 4.2.1). Through visual exploration of boxplots, we manually checked for outliers in the dependent variables (PPVT and TROG-D raw scores). No outliers were identified and the different scores were approximately normally distributed. Descriptive statistics were generated for all variables for both measurement occasions (T_1 and T_2). Raw scores were used as dependent variables. For caregivers, five different SprachKoPF-scores were calculated (total-score, knowledge-score, linguistic-knowledge-score, practical-knowledge score, skills-score).

> *Hypotheses (a) and (b)*: To perform mean comparisons from T_1 to T_2, we first conducted paired t-tests for both language variables in the IG and for receptive vocabulary in the CG. For mean comparison of caregivers' SprachKoPF-scores, we conducted the non-parametric Wilcoxon signed-rank test due to a small sample size ($N = 15$).

2.4.2. Main analysis

For main analysis, we estimated separate multilevel linear mixed-effects models predicting fixed and random effects on children's language scores (T_1 and T_2) using the lmerTest package (Kuznetsova et al., 2020). Children with incomplete observations were excluded from the main analysis. Alpha-error probability was set to 5%, i.e., we considered significance at $\alpha < 0.05$. All metric variables were standardized using their grand mean and standard deviation. Children's characteristics (age, gender, and length of exposure at T_1) were used as covariates. For the SprachKoPF total-score, we calculated a mean score for each ECD group for T_1 and T_2 and assigned them to each participating child. For visualization of our results, and especially interpretation of cross-level interactions, we used estimated marginal means of fixed effects and created interaction plots using the emmeans-package (Lenth et al., 2022). To indicate the proportion of variance explained by random effects, intraclass correlation coefficients were calculated for all variables.

> *Hypotheses (c)*: Addressing our first and second research questions about children's receptive vocabulary and grammar growth in relation to caregivers' language support competencies in

interaction with time, we created two models, i.e., regressing on PPVT- and TROG-D-scores (repeated measurement, level 1 within-child). In the two models, we considered the effect of measurement occasion (time, level 1), caregivers' SpachKoPF total-score (level 2: between children) nested in participants and caregivers, gender (level 2), age (level 2) and length of exposure (level 2) and a cross-level interaction between time and SprachKoPF total-score (level 2).

Hypotheses (d): For our third research question about children's receptive vocabulary growth compared to a control group, we regressed PPVT-scores on time, age, gender, length of exposure and group affiliation and the cross-level interaction with time (T_1 and T_2). For this model, we regressed children's receptive vocabulary (repeated measurement, level 1) on measurement occasion (time, level 1), group affiliation (level 2), gender (level 2), age (level 2) and length of exposure (level 2) and a cross-level interaction between time and group affiliation (level 2).

3. Results

3.1. Overall changes in children's language skills and caregivers' language support competencies (hypotheses a and b)

Table 4 shows the intercorrelations between child characteristics and outcome variables at T_1. Language variables correlate positively at a high level. Length of exposure did not correlate with any language variable, whereas the covariate *age* correlates with receptive vocabulary score at a low level, but not with receptive grammar score. There was a moderate negative correlation between receptive grammar score and caregivers' SprachKoPF total-score.

Table 5 shows descriptive data of IG's and CG's language variables and of caregivers' language support knowledge and skills. We found that children's performance in all language variables in both groups increased over time, as well as caregivers' language support knowledge and competencies in all scores. Paired-samples *t*-tests for mean comparison in the IG between T_1 and T_2 showed significant growth in both receptive grammar and receptive vocabulary, whereas change in receptive vocabulary scores in the CG was not significant. Regarding hypothesis (b)

TABLE 4 Intercorrelations between study variables at T1.

No.	Variable	1	2	3	4
1	Age	–	–	–	–
2	Length of exposure	0.04	–	–	–
3	Receptive grammar	0.10	0.22	–	–
4	Receptive vocabulary	**0.32****	0.16	**0.82*****	–
5	Caregivers' language support competencies	0.09	−0.26	**−0.36***	−0.25

Significant correlations (***$p \leq 0.001$, **$p \leq 0.01$, *$p \leq 0.05$) are depicted in bold.

TABLE 5 Descriptive statistics of dependent variables (raw scores) for children and caregivers at both measurement occasions (T_1 and T_2).

	Intervention group (n=48)		Control group (n=44)		Caregivers (n=15)	
	T_1	T_2	T_1	T_2	T_1	T_2
	M (SD)	*M* (SD)	*M* (SD)	*M* (SD)	*M* (SD)	*M* (SD)
Receptive grammar Raw scores	16.85 (10.64)	24.67** (12.03)	–	–	–	–
Receptive vocabulary Raw scores	35.00 (22.29)	47.36* (23.3)	34.51 (23.12)	42.72 (22.07)	–	–
Language support competencies						
Total-score	–	–	–	–	0.27 (0.18)	0.34 (0.21)**
Knowledge	–	–	–	–	0.33 (0.2)	0.41 (0.25)*
Linguistic knowledge	–	–	–	–	0.42 (0.21)	0.42 (0.29)
Practical knowledge	–	–	–	–	0.28 (0.22)	0.41 (0.25)**
Skills	–	–	–	–	0.13 (0.18)	0.24 (0.17)*

Language support competencies were assessed using SprachKoPF (Thoma and Tracy, 2014). Paired-samples *t*-test was conducted for comparison of language outcomes at T_1 and T_2. Wilcoxon signed-rank test was conducted for comparison of language support competencies at T_1 and T_2. (**$p \leq 0.01$, *$p \leq 0.05$).

Wilcoxon's Sign-Rank test of caregivers' SprachKoPF scores from T_1 to T_2 revealed significant increases in all variables except linguistic knowledge.

3.2. Effect of caregivers' improvement in language support strategies on children's language outcomes (hypothesis c)
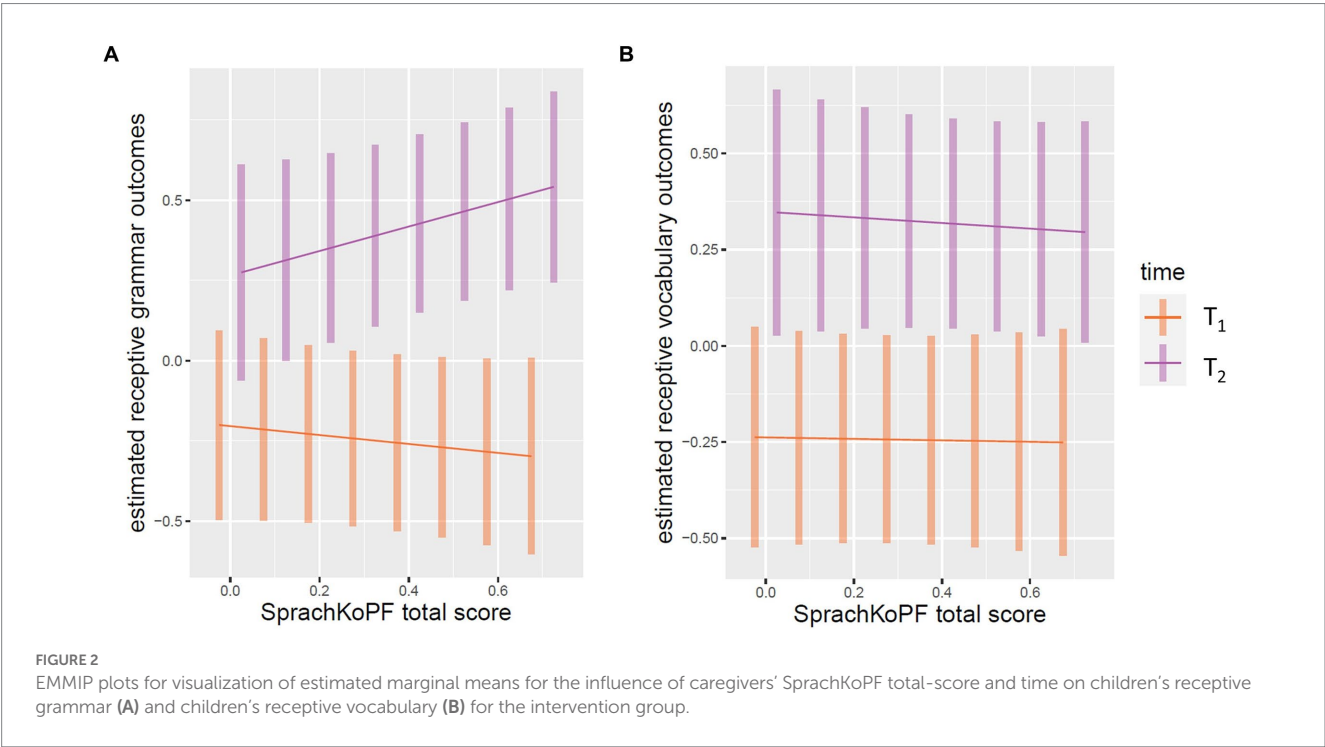
Regarding hypothesis (c), we found time and caregivers' improved scores from T_1 to T_2 in overall language support competencies to predict children's receptive grammar in the IG. Also, caregivers' language support competencies in general had a negative effect on children's receptive grammar and receptive vocabulary scores. For other covariates on language variables in the IG, we found no influences. Analysis of change in receptive vocabulary showed no impact of caregivers' language support competencies or the cross-level interactions with time. The statistical models are shown in Table 6.

Visualizations of the estimated marginal means for Models 1 and 2 are shown in Figure 2. The left figure shows that children's receptive grammar skills change as a function of an interaction between caregivers' SprachKoPF scores and time, as there is a difference in the gradient of the two graphs. For the PPVT scores, we see no interaction between the caregivers' SprachKoPF scores and time with respect to the children's estimated receptive vocabulary scores.

TABLE 6 Changes in receptive grammar and vocabulary raw scores of participants in the intervention group.

Predictor	Model 1: receptive grammar (TROG-D)			Model 2: receptive vocabulary (PPVT)		
	β	SE	p	β	SE	p
(Intercept)	−0.45909	0.18714	**0.018***	−0.24848	0.17660	0.165
Time (l.1)	0.88700	0.08473	**<2e-16***	0.72767	0.08244	**3.14e-16 ***
SprachKoPF (l.2)	−0.36196	0.10339	**0.001***	−0.20388	0.09807	**0.039***
Gender (f) (l.2)	−0.02964	0.27356	0.914	−0.20363	0.25445	0.428
Age (l.2)	0.11085	0.26405	0.677	0.04233	0.25097	0.867
LoE (l.2)	0.05509	0.13115	0.676	0.04774	0.12085	0.695
SprachKoPFxTime	0.19620	0.04154	**3.74e-06 ***	−0.06278	0.04243	0.140
AgexGender (f)	0.16299	0.36330	0.656	0.26693	0.33814	0.434

$N=48$. Significant fixed effects (***$p \leq 0.001$, **$p \leq 0.01$, *$p \leq 0.05$) are depicted in bold. We used SprachKoPF total score in both models. l.1, level 1-variable. l.2, level 2-variable. ICCs of random effects for model 1: child: ICC = 0.77, Children nested in caregivers: ICC = 0.00. ICCs of random effects for model 2: individual: ICC = 0.83.

FIGURE 2
EMMIP plots for visualization of estimated marginal means for the influence of caregivers' SprachKoPF total-score and time on children's receptive grammar **(A)** and children's receptive vocabulary **(B)** for the intervention group.

3.3. Effect of group affiliation on improvement in children's language skills (hypothesis d)

To test hypothesis (d), we calculated a linear mixed-effects model using receptive vocabulary as the dependent variable and group and the interaction between group and time instead of caregivers' language support competencies as covariates. Group membership was not linked to higher receptive vocabulary score, whereas time predicted higher scores. For more detailed results, see Table 7, visualization of estimated marginal means is shown in Figure 3. For all models, calculation of intraclass correlations indicated that, for all variables, the proportion of variance explained by intra-individual random effects is above 50 percent, whereas a negligible amount of variance could be explained by the assignment of child to caregivers (hence not considered in the multilevel structure of the statistical models).

TABLE 7 Changes in receptive vocabulary raw scores of participants in the intervention and control group.

Predictor	Model 3: receptive vocabulary (PPVT)		
	β	SE	p
(Intercept)	−0.24136	0.16871	0.161
Time (l.1)	0.34929	0.09562	**0.000***
Group (IG) (l.2)	0.13399	0.20364	0.521
Gender (f) (l.2)	−0.16090	0.18506	0.387
Age (l.2)	0.19503	0.12741	0.130
LoE (l.2)	0.18349	0.09374	0.055
GroupxTime	0.20445	0.13480	0.133
AgexGender	0.20372	0.18240	0.267

$N=91$. Significant fixed effects (***$p \leq 0.001$) are depicted in bold. l.1, level 1-variable. l.2, level 2-variable. Participants of both groups were matched beforehand regarding length of exposure and age. ICCs of random effects: individual: ICC = 0.65. IG, intervention group. f, female.
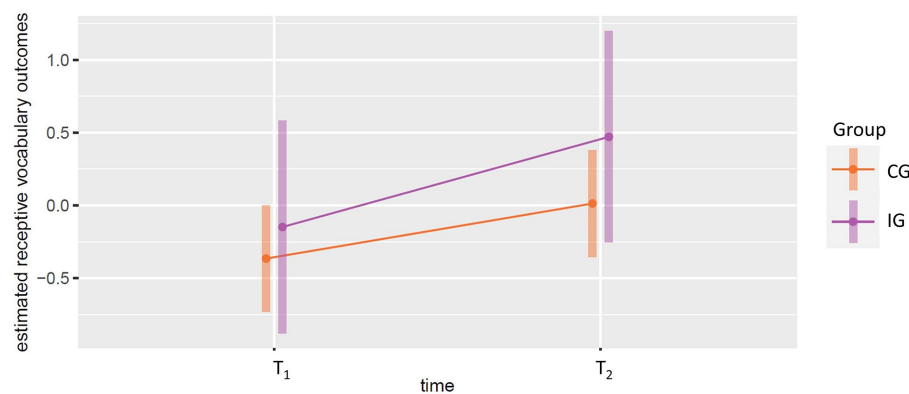
FIGURE 3
EMMIP plot for visualization of estimated marginal means for the influence of time and group affiliation on children's receptive vocabulary for the intervention group (IG) and control group (CG).

Visualization of the estimated marginal means for Model 3 underlines the results shown in Table 7. There was no clearly identifiable interaction between group affiliation and time with respect to children's estimated receptive vocabulary scores.

4. Discussion

The aim of the present study was to investigate the effectiveness of a training program for caregivers focusing on language support strategies and dialogic reading. This training focused on caregivers' language support competencies in order to promote German language acquisition of children with little exposure to German as their second language. We assessed second language abilities of children and language support knowledge and skills of caregivers visiting specialized early childhood development programs in a pre-posttest intervention design. Our first findings suggest that caregivers' language support competencies link to expanding bilingual children's receptive grammar skills, but not to receptive vocabulary skills. Children's receptive language and caregivers' language support knowledge and skills increased over time, but caregivers' competencies moderated gains in children's receptive grammar only. Children's receptive vocabulary skills could not be explained by caregivers' gains in language support knowledge and skills. The comparison between intervention group and control group supported this finding, as there was no effect of group membership on children's receptive vocabulary acquisition over time.

Overall, we found increasing receptive language scores in the intervention group from pre- to posttest in both areas. This is particularly encouraging since participating children visited the specialized early childhood development groups only for 3 h a day. As Rothman et al. (2022) suggested, we did not report standardized scores for all language measurements, due to the lack of comparability. Previous studies with bilingual children found standardized scores in pre-post analysis to remain flat, whereas raw scores changed significantly (e.g., Neumann et al., 2021). The described results regarding the increasing receptive language scores are consistent with most studies on the effectiveness of dialogic reading-interventions, as Pillinger and Vardy (2022) state in their review. Yet, most reported studies did not use control group design. To compare the results of our intervention group, we used control group data from Busch et al. (2021). The control group's receptive vocabulary raw scores did not increase noticeably. Note, however, that a comparison of grammar scores with the control group was not possible in the present study, as Busch et al. (2021) did not investigate grammar. As expected, we found that the language variables at the first measurement occasion were strongly related. Length of exposure was not related to any of the language variables, while there was a small association between age and receptive vocabulary scores, but not with receptive grammar scores. This could be explained by the fact that the participating children in the intervention and control groups showed relatively little variation regarding age and length of exposure.

Regarding caregivers' scores, we additionally found that practical language support knowledge and language support skills increased over time. This result is consistent with previous studies (e.g., Roth et al., 2015; Lemmer et al., 2019), which also found an increase of caregivers' competencies who were trained in language support measured using the instrument SprachKoPF (Thoma and Tracy, 2014). Furthermore, inspecting caregivers' language support competencies scores descriptively, we found greater variance of all scores at the posttest measurement occasion. This result is likely due to the fact that we tested caregivers' language support competencies after a five-months implementation period (with T_2 of the children) and not immediately after they participated in the training program (i.e., immediately after T_1). Thus, we cannot make conclusions about short-term effects of the intervention. However, we do have information about long-term development of caregivers' competencies, which provides insights into the quality of language support and the sustainable and lasting improvement of caregivers' knowledge and skills.

In contrast to the training programs used by Roth et al. (2015) and Lemmer et al. (2019), our training was comparatively short with 12 h. However, linguistic knowledge did not increase from pre- to posttest. In their study, Roth et al. (2015) found that caregivers performed significantly better in both knowledge domains after 12 days of training, again finding the strongest effects related to practical knowledge. We explain this finding by the fact that practical content predominated in our training program. Due to time limitations,

linguistic basic knowledge was only a subordinated topic, whereas practical knowledge about planning and evaluating language support situations dominated. A note on practical implication is in order here: As personnel shortage and time constraints prevail in ECE, it is hard to implement trainings for caregivers that are of longer duration. Even the implemented three online-training settings (of 4 h each) were partly hard to attend for the practitioners. All the more pleasant is the message that this short training block could already show significant effects on the children's language acquisition.

Regarding the performance of language support, Hruska (2017) highlights the potential of video analysis for assessing the interaction between caregivers and children. In the present study, however, we do not report results on the usage of language support strategies. It could be the case that linguistic and practical knowledge and skills are not necessarily associated with performance of language support. A recent study of Kammermeyer et al. (2019), though, reports a significant increase in the usage of modeling strategies and complex questioning strategies after a training of caregivers in the usage of language support strategies.

Although improvements in both children's language scores and caregivers' knowledge and skills could be demonstrated in the present study, only change in receptive grammar could statistically be explained by improved caregivers' outcomes, and thus we found no effect of caregivers' knowledge and skills on increasing receptive vocabulary. Contrary to our expectations, there were general moderate negative effects of caregivers' competencies on children's language scores. As a possible reason for these somewhat puzzling results, it is conceivable that those caregivers working with children who have a particularly high need for language support had already taken a much more intensive interest in the topic of language support and therefore more experience before the intervention.

Only few other studies investigated both caregivers' language support competencies and children's language outcomes and found inconsistent, but mostly positive effects on both areas (Buysse et al., 2010; Lemmer et al., 2019; Towson et al., 2020). Whereas previous research could also find effects of general dialogic reading-interventions on bilingual children's expressive vocabulary (e.g., Neuman and Kaefer, 2018), the present study once again supports previous findings about receptive vocabulary gains (e.g., Voltmer et al., 2021) by showing no effect of caregivers' training in language support on receptive vocabulary outcomes of participating children. This result is supported by the fact that we found no substantial difference between intervention group and control group regarding the gain in receptive vocabulary. Due to the fact that we used the control group data from Busch et al. (2021), we were not able to make a group comparison for receptive grammar. However, with regard to receptive grammar outcomes, we can assume that the children's language acquisition did actually benefit from the language support. One possible reason for the different effects of caregivers' training in language support strategies found on vocabulary and on grammar acquisition may lie in the nature of acquisition on these distinct language domains itself and in the different kinds of presentations and repetitions needed for their intake. As we asked the caregivers to carefully manipulate the children's input during intervention phase, it appears that the children's intake of single words is not as tied to structured situations and structured input as it is to grammatical structures. These may be more dependent on language support strategies and structured situations like dialogic reading than

vocabulary. In line with the argumentation of Voltmer et al. (2021), we assume that vocabulary acquisition "may depend less on lengthy supportive conversations" (p. 8) than grammar acquisition. Furthermore, the assessment of vocabulary is always item-based, since receptive or productive test procedures only test excerpts of the child's vocabulary and, unlike grammatical phenomena, no general vocabulary performance is assessed.

Taken together, our preliminary findings indicate that preschool children with little exposure to German as their second language can benefit from a caregivers' training program on language support strategies. As expected, we found greater increases in receptive grammar than in receptive vocabulary, and our study suggests a positive relationship between caregivers' training in language support and children's grammar acquisition.

4.1. Study limitations, future research, and practical implications

With regard to our methodological approaches, there are a number of challenges and limitations to our research which should be acknowledged. Since we aimed to implement language support into specialized preschool programs as frequently as possible, we chose to train caregivers to provide language support in everyday situations. Unlike additive language support programs, which are usually provided by external specialists, it is difficult to assess implementation fidelity for integrated interventions. Therefore, we instructed caregivers to use language support strategies and to engage in dialogic reading as often as possible (see similar procedures in Voltmer et al., 2021). To gain insight into the implementation of language support, we decided to ask the participating caregivers after the completion of the project how language support was and is still being provided after the end of the project. We assessed treatment checks afterwards with n = 13 caregivers. Most participants (69.23%) reported using language support strategies daily or several times a day after participating in the training. 30.77 percent of the respondents indicated that they consciously used language support strategies weekly or several times a week. In terms of performing dialogic reading, one participant reported performing dialogic reading several times a day. The remaining respondents reported performing dialogic reading once a week (61.53%) or several times a week (30.77%). 76.69 percent of respondents indicated that there were difficulties in conducting language support daily during the five-month project duration. Child-related factors such as low German language competencies or motivational issues were most frequently cited as difficulties as well as personnel shortage. With regard to long-term factors, we asked the professionals in the follow-up surveys about the frequency with which they now provide language support. The majority of professionals (84.62%) reported using language support strategies as frequently as they did during the project period, with two respondents reporting that they now use them more frequently. 38.46 percent of the respondents maintained the routine of dialogic reading as frequently as during the project period, four probands (30.77%) indicated that they did it less frequently after the completion of the project. Also four probands indicated they were now doing dialogic reading more frequently. Overall, respondents were satisfied with their daily language support practices and routines which have increased through participating in the research project and the training. 61.54 percent of

the respondents stated that they were rather satisfied, 30.77 percent were even very satisfied. One participant was rather unsatisfied with the own language support practices.

Another limitation of our study concerns the control group design. Children of the control and of the intervention group who attended the specialized early child development programs both had in common, that they were recent immigrants who moved into socioeconomically disadvantaged neighborhoods and visited specialized preschool programs. Yet, the two groups were not fully comparable, as the control group data were collected between 2017 and 2018 and intervention group data were collected during the Covid 19 pandemic in 2022. Additionally, we had less detailed demographic variables for the control group than for the intervention group. Therefore, we were not able to include other variables than age, length of exposure to German and gender as control variables. As bilingualism is a diverse phenomenon with different conditions that have to be considered, Rothman et al. (2022) underline that "failing to have proper control reduces the meaningfulness of any found association." (p. 2). Future studies may include at least the socioeconomic status as an important background variable as its influence on language is known (Hoff, 2003; Rowe, 2018). It should be noted, however, that the assessment of socioeconomic status is particularly difficult for children with a transnational family background due to a change in their living. It therefore can be assumed that most participating children in this study came from families classified with a low socioeconomic status in their current situation in Germany.

Other limitations concern the assessment of caregivers' language support competencies: We only reported results referring to caregivers' linguistic and practical knowledge and theoretical language support skills. We did not report caregivers' usage of language support strategies in this study. Overall, we have referred to the linguistic model for language support competence of Hopp et al. (2010). They defined three central components of language support competence: *Knowledge*, *Skills* and *Performance*. We assessed knowledge and skills using a German online questionnaire (SprachKoPF; Thoma and Tracy, 2014). Caregivers' performance of language support was also assessed in the presented project using videography of dialogic reading situations (following Beckerle et al., 2020). Qualitative and quantitative analyses of these caregivers' language support performance are still ongoing. In the present study, we could not investigate the extent to which caregivers need linguistic knowledge to successfully conduct language support. Further research is needed to analyze the connection between linguistic knowledge and actual performance and to evaluate theoretical models about preconditions for successful language support. Another limitation relates to the reliability of the skills-score reported for language support competencies, which is unsatisfactory. Therefore, we reported the skills-score descriptively although for main analysis we used the total score of the SprachKoPF whose reliability scores can be interpreted as excellent. Additionally, the SprachKoPF was conducted online because of ongoing restrictions due to the Covid-19 pandemic. Therefore, we did not have external control about caregivers' performance in the test.

Despite these limitations, our results suggest important practical implications. Overall, our training program was relatively short with 12 h, separated over 3 days. Additionally, we had a relatively high dropout of caregivers participating in our study. This underlines the difficulty of conducting training in preschool institutions, as caregivers were often not compensated for their participation by their employer. For this reason, we were also unable to offer substantial process support for the application of contents that were addressed in the training program. More intensive training is needed, which requires educational policy's interest in further training of language support professionals and compensation for the caregivers by their employer. As a recent study on specialized preschool programs for children who did not attend daycare shows, the overall quality of language support was not rated as high (Busch et al., 2023). Bilingual children who receive little or no input in their second language (German) during preschool years are more often affected by educational disadvantage compared to their monolingual peers (Tienda and Haskins, 2011; Forrell and Bellenberg, 2022) and therefore need high-quality input in their second language before entering school.

In summary, our preliminary results support previous findings about the effectiveness of caregivers' training in language support on bilingual children's receptive grammar (Neuman and Kaefer, 2018; Lemmer et al., 2019; Voltmer et al., 2021), even for very short daily dosage of childcare. The findings contribute to a growing body of evidence, that language support strategies and the implementation of dialogic reading into pedagogical everyday situations is an effective way to support children's language acquisition.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The studies involving human participants were reviewed and approved by ethics committee of the TU Dortmund University. Written informed consent to participate in this study was provided by the participants' legal guardian/next of kin.

Author contributions

JBo performed the statistical analyses and wrote the main part of the manuscript. A-LS and JBo collected the data of the experimental group. JBu and BL collected the data of the group that served as a control group for this study. A-LS administered the project and helped with writing few parts of the manuscript. JBu contributed the data, helped with analysis and wrote the chapter about specialized ECD programs. A-LS, BL, and JBu did proofreading. All authors contributed to the article and approved the submitted version.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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