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Teaching gender equality in teacher education: does existing practice actually support gender mainstreaming implementation?

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Introduction: Gender equality in education remains a global priority and a key component of sustainable development. However, its integration into teacher education programs is still inconsistent. The absence of gender-responsive education constitutes a major barrier to achieving gender equality. This study investigates the extent to which gender-responsive pedagogy is incorporated into teacher education at the University of Alicante, with a focus on the teaching content and methods employed by faculty and their impact on pre-service teachers' self-efficacy for gender-responsive practice.

Methods: A descriptive cross-sectional survey was conducted with 161 pre-service teachers at the University of Alicante. Data were collected using validated scales measuring gender-responsive teaching and teacher efficacy for gender equality practice.

Results: Findings revealed that gender-related topics are only moderately integrated into coursework, with content primarily focused on gender-based violence and equal opportunities, while foundational gender concepts receive little attention. Teaching methods largely rely on traditional approaches, such as lectures and project-based learning, rather than interactive or inquiry-based strategies. Pre-service teachers who had received gender training reported higher perceived self-efficacy in gender pedagogy; however, no statistically significant differences were observed in overall competence levels.

Discussion: The results point to a limited institutional commitment to gender mainstreaming in teacher education and underscore the need for comprehensive reforms, including curriculum revision, faculty training, and stronger institutional accountability to advance meaningful gender equality in education.

KEYWORDS

gender equality, gender mainstreaming, gender-responsive teaching, initial teacher education, pre-service teachers, self-efficacy for gender equality practice

Introduction

Gender equality (GE) is a fundamental issue of human rights and social justice, recognized as essential for sustainable development and democratic progress. Despite global advancements, significant gender disparities persist and, in some cases, have deepened, affecting both highly developed and less developed regions in the world.

Addressing these inequalities is crucial for building a more just, equitable, and prosperous society, as emphasized in the *2030 Agenda for Sustainable Development* (United Nations [UN], 2015). While GE has been a longstanding focus of international and national policies, it has only gained global prominence as a strategic priority in recent decades. Organizations like the United Nations (UN) and the European Union (EU) emphasize their importance in ensuring equal opportunities. Pivotal initiatives such as the *Beijing Declaration* (United Nations [UN], 1995), the *Education for All* movement (UNESCO, 2020), and recently the *2030 Agenda* (United Nations [UN], 1995) through SDG 5 (Gender Equality) highlight education's role in achieving GE. Despite these initiatives, significant inequalities persist, necessitating further education to reduce them.

Educational equity has been recognized as critical for fostering equitable and inclusive societies, but this aspiration cannot be achieved without equal access to education and fair treatment for all. While policies inspired by the *Convention on the Elimination of All Forms of Discrimination Against Women* (United Nations [UN], 1979) have globally improved opportunities for women, gender disparities remain, particularly in educational attainment and employment. These disparities are evident in access to resources, educational achievements, and career opportunities. Globally, women and girls face systemic barriers such as discriminatory practices and entrenched stereotypes, which hinder their participation and success. The teaching profession itself reflects these disparities. Primary education worldwide reflects a higher representation of female teachers (68%) with figures reaching 90% in Central Asia and 87% in North America and Western Europe (UNESCO, 2020, 2022). However, this female overrepresentation trend does not extend to secondary and higher education, where gender gaps in teacher representation persist. Efforts in South, West, and East Asia, alongside the Pacific, have shown incremental progress in increasing female teacher representation. In contrast, sub-Saharan Africa remains disproportionately underrepresented in female teachers.

The "gender scissor" effect illustrates that as education levels increase, the participation of women in higher education decreases. Worldwide, 111 women enroll in university for every 100 men, but at postgraduate and doctoral levels, the gap widens. In over 120 countries, fewer than 25% of students in engineering, technology, and mathematics are women (UNESCO, 2019). This disparity underscores the persistence of traditional gender roles that funnel women into socially undervalued careers while steering men toward higher paid disciplines. Similarly, while women make up 43% of higher education teaching staff, they represent only 30% of researchers globally (UNESCO, 2019) and, in the period 2014–2018, 62% of those who published in high-impact journals were men (UNESCO and International Institute for Higher Education in Latin America and the Caribbean (IESALC), 2021). Men dominate high-impact publications, with only 33.1% of first-author research articles attributed to women. This lower impact of women in research has important repercussions on higher education, as it contributes to the creation of global biases in the selection of research challenges and in eligibility for resources, limiting women's access and consolidation to prestigious academic positions associated with research merits (Bendels et al., 2018).

These gender gaps also extend to other fields and disciplines. Worldwide, women dominate nursing, midwifery, speech, language and hearing, education, social work and library science, while men are overrepresented in military science, engineering, robotics, aeronautics, high-energy physics, mathematics, computer science, philosophy and economics. Women are underrepresented in STEM fields (science, technology, engineering, and math), while men are underrepresented in arts and humanities, social sciences, and health and welfare in most countries (Bothwell et al., 2022). Additionally, men remain the majority in leadership positions within higher education (Mott, 2022). This segregation reinforces traditional gender roles and limits career opportunities.

To achieve GE, as aimed at the 2030 Agenda, the entire educational system must change by adopting policies, plans and strategies that take gender issues into account and address biased gender social norms. The strategy adopted internationally to address unequal access to and inadequate education opportunities for all has been gender mainstreaming (GM) (UN Women, 2023). GM is not a policy itself but a means to achieve GE. The EU conceptualizes GM as a "dual approach," which involves mainstreaming a gender perspective in all policies, while also implementing specific measures to eliminate, prevent or remedy gender inequalities (European Institute for Gender Equality (EIGE), n.d.). Applied to higher education teaching, GM refers to the process of including a gender perspective both in teaching and in the organizational structures (faculties and departments) using GE plans as instruments for its implementation. It is a teaching that considers sex and gender as key analytical and explanatory variables, which implies paying attention to the similarities and differences in the experiences, interests, expectations, attitudes and behavior of women, men, and disadvantaged groups as well as the causes and consequences of gender inequality to face them (Cardona-Moltó and Miralles-Cardona, 2022). Mainstreaming a gender perspective into teaching impacts study programs and teaching methods, enhancing education quality by addressing diverse student needs rather than assuming male experiences are universal. This process helps prevent gender blindness by recognizing socially imposed roles and responsibilities and fostering awareness of inequalities. Furthermore, teaching with a gender perspective contributes to identifying imbalances and promoting inclusive learning environments, assessment methods, and professional culture. However, despite being considered a core strategy for accelerating progress on GE (UN Women, 2022), in practice, many countries face challenges in implementing the strategy.

One of the primary obstacles to achieving GE in education is the absence of gender-sensitive training within higher education programs. In teacher education, studies suggest that many educators have limited awareness of gender issues, which contributes to the perpetuation of stereotypes and inequalities in classrooms (Anguita-Martínez, 2011; Aznar-Martínez et al., 2025; Sanabrias-Moreno et al., 2022). Additionally, many teacher training programs fail to provide future teachers with the necessary skills to effectively implement teaching with a gender perspective. Research also points to significant resistance against integrating gender perspectives into university curricula, reflecting broader structural, cultural, and institutional barriers that hinder progress toward more equitable societies (Lombardo and Mergaert, 2013; Verge et al., 2018). The reliance on fragmented initiatives and surface-level interventions further exacerbates these challenges, preventing

educators from developing the skills needed to create inclusive, gender-sensitive learning environments.

Few studies exist on teaching gender in teacher education, demonstrating that gender-related topics are poorly integrated into the curriculum (Aikman et al., 2005; Edwards et al., 2020). There appears to be a general knowledge gap and a low awareness of gender issues among teacher educators and institutions, a gap that needs to be overcome by providing gender training (GT) opportunities. Because fragmented approaches are the norm, future teachers complete their university preparation without having adequately developed the skills necessary to incorporate gender pedagogy into their future professional practice. In Spain, studies such as those of González-Pérez (2017), Rodríguez-Jaume and Gil-González (2021) at Xarxa Vives Universities, Larrondo and Rivero (2019) at the University of the Basque Country, Valdivieso et al. (2016) at the University of Las Palmas, or Resa (2023) at the Complutense University of Madrid, among others, highlight indifference to including gender issues in university curricula and pedagogy, a case that seems to be common to all branches of knowledge in European countries (Atchison, 2013; Grünberg, 2011; Kreitz-Sandberg and Lahelma, 2021; Weiner, 2000; Zippel et al., 2016), as well as the broader global context (Bothwell, 2022; Times Higher Education, 2023; World Economic Forum, 2023).

The EU has supported projects through Horizon 2020, funding research and institutional networks to improve GE training in higher education. Notable examples include the EFFORTI3 project (Evaluation Framework for Promoting Gender Equality in Research and Innovation) and the implementation of GE plans. Despite these efforts, progress has been slow and insufficient (UN Women, 2023). To complement these initiatives, the European Community has funded coordination and support actions through the creation of teacher training academies for institutional change (Gender Equality Academies) (Monteiro et al., 2024) and a European network of Communities of Practice (CoP) to address gender inequalities in the field of research and innovation (e.g., ACT-on-Gender). However, these efforts often lack resources and are sometimes treated as compliance exercises rather than meaningful reforms.

To bridge these gaps, adopting gender-responsive pedagogy (GRP) is essential. Gender-responsive pedagogy is a transformative approach to learning and teaching that considers learners' unique needs, experiences, and capacities based on their gender (Chapin et al., 2020; Doroba et al., 2015; Mlama et al., 2005). It seeks to challenge and dismantle traditional gender norms and stereotypes that may limit individuals' potential and restrict their access to quality education. It is about being conscious of the intersection between gender and learners' needs to rectify the imbalances in society (Chapin and Warne, 2020). Gender-responsive pedagogy brings in gender-sensitive teaching that focuses on what is taught, how it is delivered, and how it is retained in both male and female learners (Rosa and Clavero, 2022; Thege et al., 2020).

The theoretical framework of GRP is built on the following key principles (Chapin et al., 2020; Doroba et al., 2015; Mlama et al., 2005): (1) *Inclusivity*: GRP aims to create inclusive learning environments where all students feel respected, valued, and empowered to participate fully in the educational process; (2) *challenging stereotypes*: GRP seeks to dismantle traditional gender norms and stereotypes that may limit individuals' potential and restrict their access to quality education; (3) *intersectionality*:

GRP acknowledges that gender intersects with other social identities, such as race, class, and sexual orientation, shaping students' educational experiences; (4) *equity*: GRP promotes equal opportunities for all students, regardless of gender, to engage in and succeed in all subjects, including STEM fields.

For teacher training, these principles are essential. Teachers trained in GRP are better equipped to plan lessons, manage classrooms, and evaluate student performance through a gender-sensitive lens (Kumar, 2024). The goals of GRP training include: (1) raising educators' awareness of gender issues and concepts; (2) providing educators with strategies to integrate gender into all aspects of teaching and learning; (3) encouraging problem-solving and innovation in addressing gender disparities in educational settings; and (4) enhancing institutional capacities to develop gender-transformative curricula and practices (Kumar, 2024; UNESCO, 2024). By adopting GRP, educators can act as agents of change, fostering an educational landscape that promotes GE and dismantles systemic barriers. The relevance of GRP to teacher education is considerable, as it plays a key role in preparing educators to foster inclusive and equitable learning environments. First, teacher training programs must equip future educators with the skills and knowledge necessary to implement gender-responsive practices in the classroom. In addition, these programs should emphasize awareness-raising around gender issues in education, helping teachers identify and address gender-based barriers while promoting strategies for achieving GE. Finally, teacher education should encourage reflective practice, prompting educators to critically examine their own beliefs, biases, and instructional methods related to gender, in order to adopt more inclusive and equitable approaches.

Much of the research to date related to GRP has been conducted in African countries and the strategies carried out there are inspiring (Forum for African Women Educationalists, 2020). Research from Bhutan and Ethiopia highlights that many educators lack the knowledge to implement effective GRP, often resulting in unequal opportunities in classrooms (British Council, n.d.; Dorji, 2020). Similarly, studies from Jordan, Ireland, Spain, and other countries around the globe reveal gender imbalances in teaching materials and assessments (Guichot-Reina and De la Torre-Sierra, 2023; Hasan, 2015), reinforcing stereotypes about male and female roles in society. Furthermore, teachers' perceptions of students—such as underestimating girls' abilities in subjects like mathematics or assigning them passive roles—further perpetuate gender disparities. To address these issues, teacher training programs must emphasize gender awareness, equipping educators with strategies to recognize and counteract biases in their teaching practices. By integrating GRP into both initial and continuous teacher training, educators can create more equitable learning environments that empower all students to succeed.

In Spain, there is a lack of research on these topics. The insufficient evidence about what teacher educators are teaching when they teach GE in teacher education demands further research. In this regard, this study investigated in a Spanish higher education institution (the University of Alicante, UA) how teacher educators embed gender responsive pedagogy into their teaching practices with pre-service teachers. The purpose of the study was to examine the extent to which GRP is being incorporated into teacher education at the UA, with a particular focus on the faculty teaching practices and their impact on pre-service teachers' self-efficacy for

gender-responsive teaching (GRT). Specifically, the study aimed to identify the content and methods used by UA teacher educators to teach with a gender perspective and to analyze how GT influences students' ability to teach using a gender-responsive approach. It examined how training supports the development of students' knowledge, gender awareness, pedagogical practice, and gender-sensitive values and attitudes. The study also assessed pre-service teachers' self-efficacy for gender-equitable practice at the end of their training, comparing those with and without GT, and explored the relationship between GRT and self-efficacy for GE practice. To address these objectives, the following research questions were formulated:

> **RQ1.** What content and methods do teacher educators use to address GE through their teaching assignments?
> **RQ2.** How do these teaching practices impact future teachers' ability to develop gender knowledge and awareness, to apply GRP and to foster gender-sensitive values and attitudes?
> **RQ 2.1.** What is the level of self-efficacy for a GE practice student teachers acquire by the end of their degree program? Does this level differ between those who did and did not receive GT?
> **RQ 2.2.** Is there a relationship between GRT and the perceived ability to teach with a gender perspective?

Identifying the content and methods used by teacher educators will highlight gaps and best practices in preparing future teachers for GRT at UA. Building on these insights, the findings can inform the development of professional training programs that enhance teacher educators' ability to integrate GE into their instruction. Furthermore, assessing self-efficacy levels among student teachers will help design targeted interventions to strengthen their confidence in applying GRP.

Materials and methods

To answer the research questions, this study employed a non-experimental research approach using a descriptive cross-sectional survey design (Bryman, 2016), which is suitable for assessing current perceptions of GRT and self-efficacy for GE practice among pre-service teachers. The study adhered to the Declaration of Helsinki and EU Regulation 2016/679 (General Data Protection Regulation) and was granted exemption from review by the UA Ethics Committee (Approval Code: UA12162/2023).

Participants and context

The UA is a publicly funded university located in the Valencian Community, Spain. Established in 1979, it serves as a modern, multidisciplinary institution committed to teaching, research, and innovation. It has a student population of approximately 25,000, of whom about 1,200 graduate annually from the Faculty of Education, most of them being Spaniards (99%) and women (71%). The UA has aligned its policies with the 2030 Agenda for Sustainable Development and the European GE directives following the enactment of *Organic Law 3/2007* by the Spanish

Government, 2007. Since then, the institution has undertaken various initiatives to develop gender-related policies through GE plans and is currently operating under its Fourth Equality Plan (University of Alicante [UA], 2022). Despite institutional efforts, the implementation of the plan remains limited, particularly regarding Axis 1 (Gender Awareness and Training) and Axis 2 (Teaching with a Gender Perspective). Notably, although 67% of degree programs incorporate gender-related competencies, few offer dedicated courses on the subject or include the gender perspective in the subjects taught. Specifically, only 7 out of 45 degree programs (15.5%) include gender-specific courses, with 3 programs offering compulsory gender-focused courses, and 4 providing them as elective options. These courses are primarily concentrated in faculties such as Economics, Law, Education, and Philosophy, with minimal representation in other disciplines. On the other hand, although some educators claim to teach their subjects with a gender perspective, most teaching guides do not usually refer to gender in the objectives, content or methodology sections (University of Alicante [UA], 2022).

The participants in this study were 161 undergraduate pre-service teachers pursuing degrees in Elementary and Secondary Education teaching degrees at the College of Education. They were selected purposely from an advanced-level course within their teaching degree programs. Of the 161 participants, 78 (48.44%) were on the Elementary Education track and 83 (51.55%) on the Secondary Education track. Their ages ranged from 19 to 44 years old ($M = 24.13$, SD = 5.67). The majority were female ($n = 122$, 76%), while 24% were male ($n = 39$). Nearly all participants were Spaniards (99%). Twenty-three percent of the participants ($n = 37$) reported having received formal GT (11 h on average), while 77% ($n = 124$) did not receive any. Thirty-three percent ($n = 53$) observed institutional changes due to the implementation of gender policies at UA and 46% ($n = 74$) perceived also changes in teaching practices. Overall, participants rated GE training as very important for their education as future teachers ($M = 9.06$ out of 10, SD = 1.53). Although gender is considered a transversal competence in some degree programs, gender topics are often absent from coursework. However, students have the option to take a three-credit elective course on "Education for Gender Equality."

Measures

The study assessed GRT and self-efficacy for GE practice using the following scales.

Gender-responsive teaching index

It measures what gender content is taught and how it is taught. This index is a subscale of the Spanish version of the *Education for Sustainable Development of Gender Equality (ESD 5)* index (Miralles-Cardona, 2024). It consists of 13 items grouped into two factors: (1) Gender Content in Coursework (7 items) that assesses the extent to which faculty includes gender topics in their teaching subjects, and (2) Gender-Responsive Teaching Methods (6 items) that measures the use of gender-inclusive teaching approaches. The participants were asked to answer two questions: (1) How often did faculty address GE topics during their teaching assignments? and (2) How often did faculty employ different methodological

approaches to teach gender? Responses were recorded on a 5-point Likert scale (1 = *Never,* 2 = *Rarely,* 3 = *Sometimes,* 4 = *Often,* and 5 = *Always*), with higher values indicating greater integration of gender into their teaching. Preliminary analysis of the GRT index using Spanish student teachers reveals that the instrument has internal consistency (Cronbach's alpha > 0.90), and it is valid for what it aims to measure, having shown evidence of its content validity, CVI 0.97 (Lawshe, 1975) and construct validity (Miralles-Cardona et al., 2024).

Teacher efficacy for gender equality practice

Pre-service teachers' self-efficacy in GRT was measured using the Teacher Efficacy for Gender Equality Practice (TEGEP) scale (Miralles-Cardona et al., 2022). This 22-item self-reported measure comprises three subscales: (1) Efficacy in Gender Knowledge and Awareness (9 items) that measures ability to define and recognize gender issues, (2) Efficacy in Using a Gender Pedagogy (9 items) that assesses confidence in applying GRT strategies, and (3) Efficacy in Cultivating Gender Attitudes (4 items) that measures ability to promote gender-sensitive attitudes and values in students. Items begin with the expression "I can...," "I am confident in...," or "I am able..." and are answered using a 6-point Likert scale (1 = *Strongly Disagree*, 6 = *Strongly Agree*). The TEGEP allows obtaining individual scores by item, by factors, and a total score. High scores on the TEGEP reflect higher perceived capacity for GE practice. The TEGEP scale has adequate psychometric properties, high reliability as internal consistency (Cronbach's alpha > 0.93) and good content and construct validity, substantiated using Spanish and Greek samples (Kitta and Cardona-Moltó, 2022; Miralles-Cardona et al., 2022, 2023). Likewise, the correlations between factors are positive and statistically significant ($r = 0.86$ between skills and knowledge, $p < 0.01$; $r = 0.80$ between skills and attitudes, $p < 0.01$; and $r = 0.78$ between knowledge and attitudes, $p < 0.01$), values that can be considered strong.

Data collection procedure

Data was collected during class time in the second semester of the 2022–2023 academic year from one of the mandatory courses of the teaching degree program. All of the participants gave informed consent after being advised of the voluntary, anonymous, and confidential nature of the study, as well as their right to decline participation at any time during the survey administration. The questionnaire was administered in-person to all students enrolled in the selected course. Students who chose not to participate returned blank surveys. Completion time was approximately 10 min. The questionnaire consisted of three parts. Part I contained Demographic Information (8 items); part II, the GRT index (13 items); and part III, the TEGEP scale (22 items).

Data analysis

Preliminary analyses involved conducting an exploratory factor analysis (EFA) of the GRT index to examine its underlying structure, alongside an assessment of reliability using Cronbach's alpha. Data distribution was evaluated through skewness and kurtosis values, while normality was assessed based on the Muthén

and Kaplan (1985) criteria (−2 to +2 range). To address the research questions, a range of statistical methods were employed. Descriptive statistics (means, frequencies, and percentages) were used to summarize the data. Independent samples *t* tests were conducted to compare TEGEP scores between participants with and without GT, with effect sizes calculated using Cohen's *d*. Additionally, bivariate correlation analysis was performed to explore associations between GRT (Gender Content Taught and GR Teaching Methods) and self-efficacy for GE practice (Gender Knowledge/Awareness, Gender Pedagogy, and Gender Attitudes). To account for the increased risk of Type I error due to multiple comparisons, Bonferroni corrections were applied specifically to the item-level *t* tests. All statistical analyses were carried out using SPSS (version 28).

Results

Preliminary analysis: exploratory factor analysis, normality check, and reliability

Table 1 presents the results of the EFA, conducted exclusively with respondents who had received GT ($n = 37$) and, therefore, possessed the necessary information to respond to the items of the GRT index. Additionally, the table includes descriptive statistics, such as means, standard deviations, skewness, and kurtosis, for each of the 13 items in the GRT index.

Exploratory factor analysis

The Kaiser–Meyer–Olkin (KMO) measure of sampling adequacy yielded a value of 0.772, indicating that the sample was suitable for EFA. Bartlett's test of sphericity confirmed the appropriateness of the analysis, yielding a statistically significant result: χ^2 (78) = 257.51, $p < 0.000$. Principal component analysis was employed for factor extraction, followed by Varimax rotation. The results identified two factors within the index. The first factor, with an eigenvalue of 5.83, accounted for 44.83% of the total variance, while the second factor (eigenvalue of 2.11) explained an additional 16.26%, culminating in a cumulative variance of 61.09% (Table 1).

Reliability

The internal consistency of the GRT was assessed using item-total correlation and Cronbach's alpha for both the overall scale and its subscales. The overall Cronbach's alpha coefficient was high ($\alpha = 0.877$), indicating strong internal consistency. By subscale, the Gender Content Taught factor showed a reliability coefficient of $\alpha = 0.887$, while the Gender Approaches factor had a coefficient of $\alpha = 0.800$, both of which are considered good reliability, according to Thorndike (1997). Item-total correlation values ranged from 0.288 to 0.796, supporting the scale's reliability.

Normality check

As shown in Table 1, all items met the normal distribution requirement values of the skewness and kurtosis, which were within an acceptable range of −2 to +2, as suggested by Muthén and Kaplan (1985). Regarding the Gender Content subscale, the highest mean corresponds to Item 4 "Gender-based equal opportunities" with a mean of 3.69, while the lowest corresponds

TABLE 1 Exploratory factor analysis matrix of rotated components and descriptives of GRT index.

GRT index (factors and items)		Factor 1	Factor 2	*M*	SD	Skewness	Kurtosis
Gender content taught							
1	Foundations and principles of gender equality.	0.790		3.14	1.03	−0.132	−0.351
3	Diversity and gender identify.	0.729		3.26	1.12	−0.411	−0.368
4	Gender-based equal opportunities.	0.796		3.69	0.86	−0.104	−0.781
5	Gender inequalities.	0.738		3.51	1.06	−0.116	−1.19
9	Social justice and equity.	0.675		3.51	1.09	−0.324	−0.671
10	Gender-based violence.	0.765		3.60	1.16	−0.549	−0.389
11	Abuse in power relations based on gender.	0.829		3.37	1.23	0.278	−0.749
Gender-responsive teaching methods							
13	Lecture-based teaching.		0.698	2.23	1.16	0.238	−0.611
15	Project-based teaching.		0.567	3.17	1.33	−0.254	−1.13
17	Online and/or technology-based teaching.		0.716	2.89	1.34	−0.088	−1.16
19	Case study-based teaching.		0.714	2.94	1.25	−0.074	−0.883
23	Research-based teaching.		0.716	2.83	1.31	0.007	−1.02
24	Guided discovery teaching.		0.763	2.66	1.23	0.112	−1.05

KMO = 0.722. Bartlett test: $\chi^2(78) = 257.51$, $p < 0.000$. % Variance explained: 61.09%. *Alpha:* whole scale = 0.877; factor 1 = 0.887; factor 2 = 0.800. Scale range 1–5 (1 = *Never*; 2 = *Rarely*; 3 = *Sometimes*; 4 = *Often*; 5 = *Always*).

to Item 1 "Foundations and principles of gender equality" with a mean of 3.14, on a five-point scale, thus placing them around the midpoint of the scale, which is 3. The item with the most homogeneous responses was Item 4 (SD = 0.86), whereas the most heterogeneous was Item 11 "Abuse in power relations based on gender" (SD = 1.23). For the Gender-Responsive Teaching Methods subscale, Item 15 "Project-based teaching" had the highest mean (3.17), while Item 13 "Lecture-based teaching" had the lowest (2.23). The item with the greatest response variability was Item 17 "Online and/or technology-based teaching" (SD = 1.34), whereas the most consistent responses were observed for Item 13 "Lecture-based teaching" (SD = 1.16).

RQ1. Gender-responsive teaching

Table 2 presents the findings related to RQ1: What content and methods do teacher educators use to address gender equality? As indicated by the average mean responses of factor 1, Gender Content Taught (Table 1), teacher educators incorporated gender-related issues into their teaching to a moderate extent (*M* = 3.40, SD = 0.84). However, certain gender-related topics were emphasized more than others (see Table 2). The most frequently addressed topics were "Gender-based violence" (Item 10), "Gender-based equal opportunities" (Item 4), "Gender inequalities" (Item 5), and "Social justice and equity" (Item 9), with 57.1% (Item 10) and 54.3% of respondents (Items 4, 5, and 9), respectively, reporting that these topics were covered frequently and extensively during coursework. In contrast, the least frequently addressed topic was the "Foundations and principles of gender equality" (Item 1), with only 28.6% of respondents indicating that it was covered frequently and only 8.6% stating that it was addressed extensively. The full distribution of these percentages is graphically presented in Figure 1.

Regarding the GRT methods employed by teacher educators to teach gender-related topics (factor 2 of the GRT index), respondents reported that "Project-based teaching" (Item 15) was the most frequently utilized strategy, with 48.5% indicating that their instructors used it often or always. Similarly, "Lecture-based teaching" (Item 13) was also commonly employed, with 42.9% of respondents reporting frequent or extensively. In contrast, the least frequently used approaches were "Online and/or technology-based teaching" (Item 17), "Research-based learning" (Item 23), and "Guided discovery teaching" (Item 24). Notably, 22.9% of respondents stated that guided discovery teaching was never or rarely used during their coursework, highlighting a significant gap in the application of more interactive and exploratory teaching methodologies. Figure 2 provides a visual representation of these findings.

In summary, the findings pointed out that teacher educators infuse gender-related content into their teaching to a moderate extent, with a tendency to prioritize issues that directly relate to real-world social problems such as gender-based violence over more theoretical topics such as foundations of GE. Likewise, the data suggests a preference for familiar teaching methods, such as project-based teaching and lecture-based instruction, rather than less commonly used, more demanding, and more time-consuming approaches, such as guided discovery teaching and research-based learning.

## RQ2. Impact of gender-responsive teaching on self-efficacy for GE practice

Overall level of self-efficacy for GE practice

The results indicated that respondents who received GT generally reported a higher self-efficacy to implement GE practices

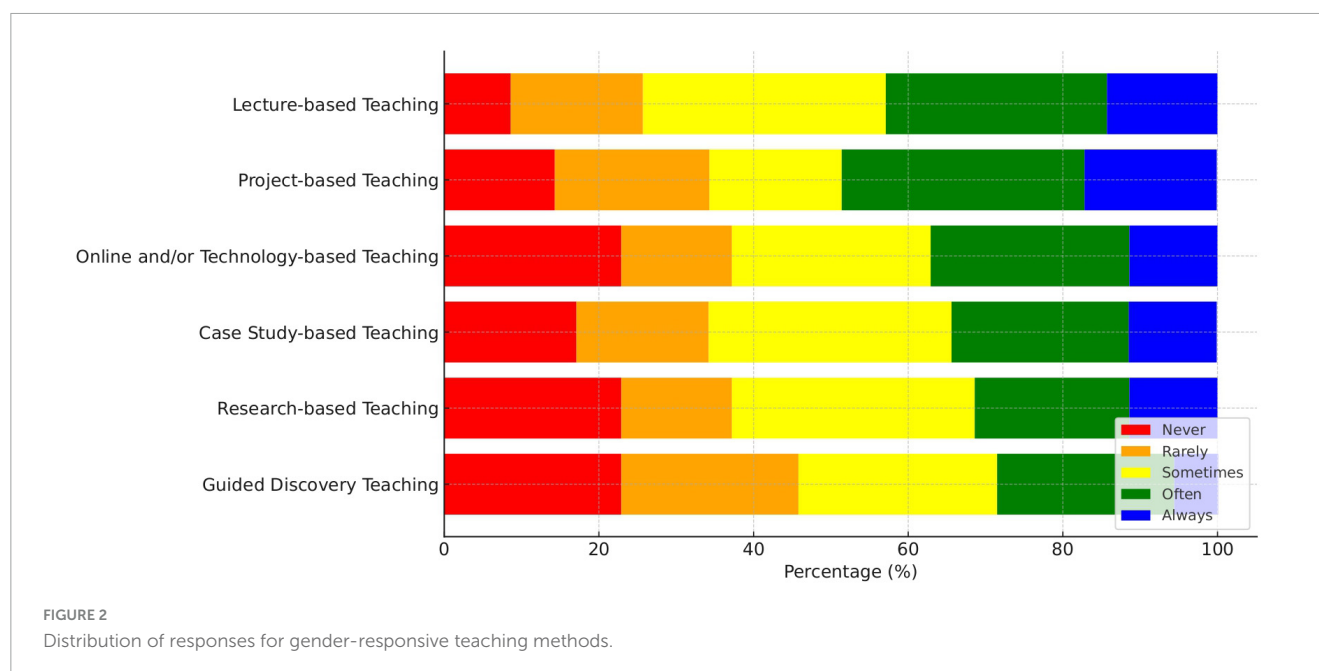TABLE 2 Frequencies and percentages of responses to the GRT index.

GRT index (factors and items)		Never		Rarely		Sometimes		Often		Always	
		f	%	f	%	f	%	f	%	f	%
Gender content taught											
1	Foundations and principles of gender equality.	2	5.7	7	20	13	37.1	10	28.6	3	8.6
3	Diversity and gender identify.	3	8.6	5	14.3	11	31.4	12	34.3	4	11.4
4	Gender-based equal opportunities.	0	0.0	2	5.7	14	40	12	34.3	7	20
5	Gender inequalities.	0	0.0	8	22.9	8	22.9	12	34.3	7	20
9	Social justice and equity.	1	2.9	6	17.1	9	25.7	12	34.3	7	20
10	Gender-based violence.	2	5.7	4	11.4	9	25.7	11	31.4	9	25.7
11	Abuse in power relations based on gender.	3	8.6	5	14.3	11	31.4	8	22.9	8	22.9
Gender-responsive teaching methods											
13	Lecture-based teaching.	3	8.6	6	17.1	11	31.4	10	28.6	5	14.3
15	Project-based teaching.	5	14.3	7	20	6	17.1	11	31.4	6	17.1
17	Online and/or technology-based teaching.	8	22.9	5	14.3	9	25.7	9	25.7	4	11.4
19	Case study-based teaching.	6	17.1	6	17.1	11	31.4	8	22.9	4	11.4
23	Research-based teaching.	8	22.9	5	14.3	11	31.4	7	20	4	11.4
24	Guided discovery teaching.	8	22.9	8	22.9	9	25.7	8	22.9	2	5.7

FIGURE 1
Distribution of responses for gender content taught.
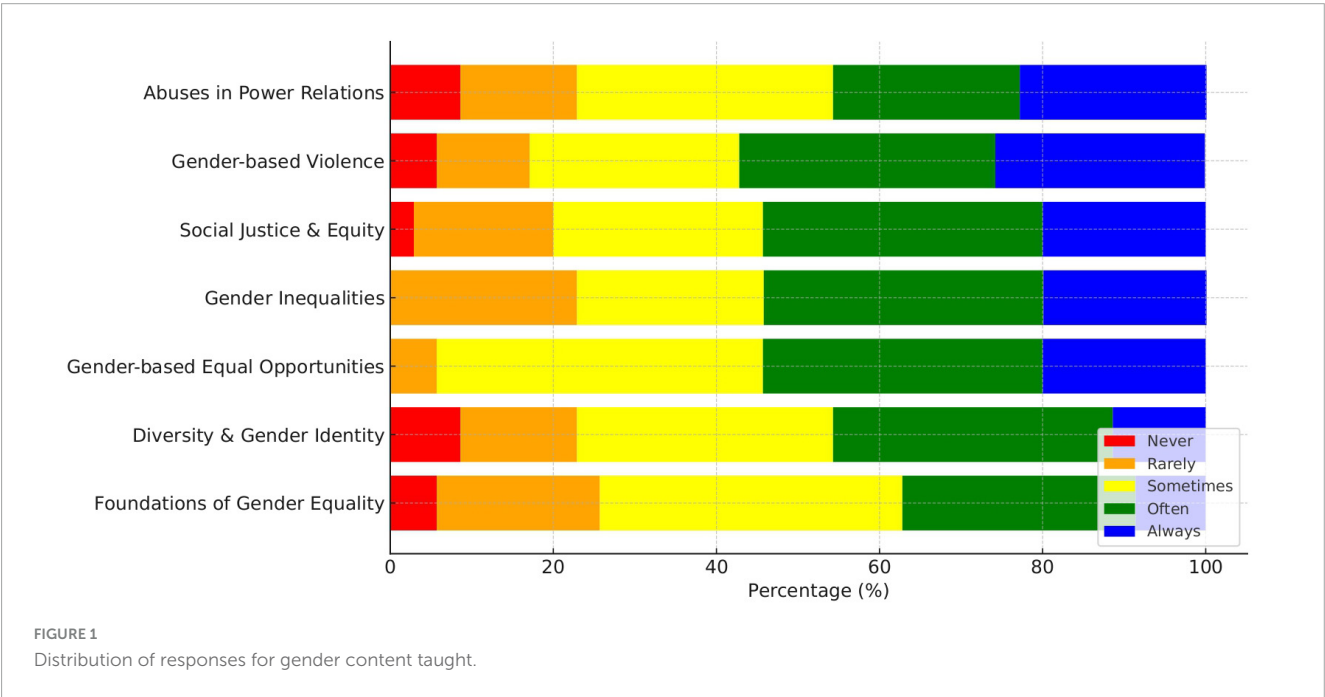
compared to those who did not receive training (Table 3). Specifically, for self-efficacy in Gender Knowledge/Awareness, participants with GT rated their knowledge with a higher mean score ($M = 4.26$, SD = 0.87) compared to those without GT ($M = 4.03$, SD = 0.88); for self-efficacy in Gender Pedagogy, a similar pattern was observed, with trained respondents reporting higher self-efficacy ($M = 4.64$, SD = 0.80) than untrained respondents ($M = 4.37$, SD = 0.87); while for self-efficacy in Gender Attitudes, the difference in scores was minimal, with means of $M = 5.26$ (SD = 0.71) for trained participants and $M = 5.23$ (SD = 0.73) for those without training.

Differences in self-efficacy between those with and without gender training

To fully address the RQ 2.1, responses to the TEGEP were compared between participants who had received GT and those who had not. An analysis of the results by factors (Table 3) using independent samples t-test revealed no statistically significant differences in self-efficacy across the three main dimensions: Gender Knowledge/Awareness ($M = 4.26$ vs. 4.03, $t[159] = 1.40$, $p = 0.164$), Gender Pedagogy ($M = 4.64$ vs. 4.37, $t[159] = 1.70$, $p = 0.092$), and Gender Attitudes ($M = 5.26$ vs. 5.23, $t[159] = 0.20$,

FIGURE 2
Distribution of responses for gender-responsive teaching methods.

$p = 0.841$) (see Figure 3 for a visual comparison of mean self-efficacy scores across the three dimensions). Independent samples t tests conducted for each item, applying a Bonferroni-adjusted alpha level, did not yield statistically significant differences between groups. However, examination of mean differences using Cohen's d revealed several moderate effect sizes. The largest differences were found in items related to knowledge of GE legislation ($d = 0.419$), recognition of gender discrimination ($d = 0.463$), ability to deconstruct gender stereotypes ($d = 0.488$), and collaboration in developing school GE plans ($d = 0.444$). Although these differences did not reach significance after correction, the effect sizes suggest practical relevance.

Association between gender-responsive teaching and teacher self-efficacy for GE practice

Pearson correlation coefficients were calculated to examine the relationship between GRT (overall GRT index scores) and self-efficacy in teaching using a gender-responsive approach (TEGEP scale overall scores). The results indicated a moderate correlation between GRT and teacher self-efficacy for GE practice ($r = 0.37$, $p < 0.026$). Further analysis of correlations between specific factors revealed that Gender Content Taught was positively associated with self-efficacy in Gender Knowledge ($r = 0.54$, $p < 0.001$) and self-efficacy in cultivating Gender Attitudes ($r = 0.35$, $p < 0.032$), both of moderate magnitude, while GRT Methods showed no association with any dimensions of self-efficacy for GE. These findings suggest that GRT, particularly Gender Content Taught, plays a role in enhancing teachers' ability to teach with a gender perspective. Table 4 presents the correlations between the examined variables.

Discussion

This study aimed to investigate the extent to which GRP is integrated into university teaching at UA, specifically examining how teacher educators incorporate GRT into their instructional practices. The research pursued to achieve two key objectives: (1) identify the teaching content and approaches used by teacher educators to teach GE; and (2) examine the impact of GRT (teaching methods and content) on pre-service elementary and secondary school teachers' self-efficacy in implementing GE practices, in addition to the association between GRT and perceived ability to teach using a gender-responsive approach.

Before addressing the first research question, preliminary analyses were carried out to check the psychometric properties of the Spanish version of the GRT index (Miralles-Cardona, 2024). Using this study's sample, the GRT index revealed a two-factor structure that appropriately captures the constructs measured, explaining 61.09% of the total variance. Furthermore, the index exhibited strong internal consistency, with an overall reliability coefficient of $\alpha = 0.877$ ($\alpha = 0.887$ for GCT and $\alpha = 0.800$ for GTM, respectively), indicating that the instrument possesses adequate psychometric properties for use in teaching contexts. This finding is significant as it provides a valid and reliable tool for examining the teaching content and gender-responsive methods educators utilize when teaching gender-related topics. This instrument is unique in its kind and, therefore, helps fill a gap in the GM literature. Previous studies examining the implementation of GM in teaching have primarily focused on the presence or absence of gender-related courses and content in the curriculum rather than analyzing pedagogy—specifically, what is taught and how gender is taught (Aikman et al., 2005; Aznar-Martínez et al., 2025; Edwards et al., 2020).

Data collected using the GRT index to address RQ1 revealed that gender issues were only occasionally addressed in university teaching. Among the seven assessed topics, none were perceived by students as being covered "often," suggesting that gender topics were addressed only moderately. However, a few themes—gender-based violence, gender-based equal opportunities, gender inequality, and social justice and equity—were reported by a majority of respondents (>50%) as being discussed at least "sometimes." Regarding the methods used to address gender

TABLE 3 Respondents' perceived capacity to teach using a GR approach (comparison of means between respondents who have and have not received gender training).

TEGEP scale (subscales and items)		With GT		Without GT		t	CI (95%)
Gender knowledge and awareness		M	SD	M	SD		
1	Legislation on gender equality.	3.49	1.26	2.98	1.17	2.24	[0.13, 0.89]
2	Gender equality vs. gender equity.	3.46	1.37	3.44	1.22	0.09	[−0.38, 0.42]
3	Gender identity.	4.22	1.18	4.15	1.26	0.31	[−0.31, 0.45]
5	Gender roles.	4.68	1.22	4.35	1.21	1.41	[−0.05, 0.71]
7	Gender discrimination.	4.95	0.85	4.50	1.08	2.62	[0.15, 0.75]
9	Gender biases.	3.49	1.37	3.16	1.43	1.13	[−0.10, 0.76]
10	Sex vs. gender.	4.32	1.35	4.46	1.30	−0.55	[−0.55, 0.27]
12	Gender inequalities.	4.76	1.03	4.51	1.15	1.17	[−0.09, 0.59]
13	Gender stereotypes.	4.97	0.98	4.69	1.16	1.33	[−0.05, 0.61]
	Total factor	4.26	0.87	4.03	0.88	1.40	[−0.04, 0.50]
Gender pedagogy							
17	Providing equal opportunities to all my students.	5.19	0.88	4.87	0.99	1.79	[0.03, 0.61]
18	Deconstructing gender stereotypes.	4.97	1.01	4.46	1.08	2.56	[0.19, 0.83]
21	Empowering to tackle gender inequality.	4.16	1.34	3.95	1.24	0.89	[−0.19, 0.61]
22	Respecting gendered learning styles.	4.35	1.36	4.13	1.29	0.90	[−0.19, 0.63]
23	Creating learning environments that foster gender collaboration.	4.78	1.03	4.69	0.99	0.53	[−0.22, 0.40]
24	Designing, implementing, and assessing gendered lesson plans.	4.05	1.30	4.10	1.21	−0.18	[−0.44, 0.34]
29	Involving families in supporting and implementing school-home GE plans.	4.73	1.14	4.38	1.15	1.62	[−0.0, 0.70]
30	Collaborating with colleagues in developing and improving the school's equality plan.	5.03	0.98	4.56	1.13	2.24	[0.14, 0.80]
31	Educating on gender issues.	4.49	1.26	4.28	1.24	0.88	[−0.18, 0.60]
	Total factor	4.64	0.80	4.37	0.87	1.70	[0.01, 0.53]
Gender attitudes							
27	Conveying values on gender equity.	5.21	0.91	5.07	0.91	0.74	[−0.14, 0.42]
32	Exercising sensitive attitudes toward gender diversity.	5.22	0.94	5.08	0.92	0.75	[−0.15, 0.43]
35	Speaking up against any form of gender injustice or discrimination.	5.03	1.01	5.15	0.93	−0.66	[−0.42, 0.18]
38	Criticizing existing tolerance with gender discrimination and violence.	5.54	0.73	5.48	0.77	0.45	[−0.17, 0.29]
	Total factor	5.26	0.71	5.23	0.73	0.20	[−0.19, 0.25]

Scale range 1–6 (1 = Strongly Disagree; 2 = Disagree; 3 = Somewhat Disagree; 4 = Agree Somewhat; 5 = Agree; 6 = Strongly Agree); df (159). GT = gender training; CI = confidence interval.

topics, nearly half of the respondents reported that project-based teaching (48.5%) and lecture-based instruction (60%) were used frequently or often. In contrast, the remaining methodological approaches were rarely or sporadically implemented by teacher educators. These findings are both revealing and novel, as they indicate that GE content is largely absent from curriculum and pedagogy, hindering the development of gender knowledge and skills among pre-service teachers, and should be interpreted in light of the barriers that may be limiting more gender-sensitive teaching. A recent study by Miralles-Cardona et al. (2025) at the same institution reveals that one of the primary challenges in implementing GR teaching at the UA is the lack of institutional support and structured GM. Although policies promoting GE exist, they are poorly enforced, resulting in minimal impact on university curricula. Institutional resistance further exacerbates the issue, as some faculty members and administrative structures remain reluctant to adopt gender-sensitive policies,

leading to fragmented efforts rather than a coordinated, university-wide commitment. This reluctance is reflected in the low prioritization of gender-related teaching content, which weakens the effectiveness of existing initiatives. Another major obstacle is the inadequate GT for educators. Many faculty members lack formal training in gender issues, making it difficult for them to incorporate gender perspectives into their teaching. While workshops and seminars are occasionally offered, these short-term interventions are insufficient for fostering lasting curricular and pedagogical transformation. Without continuous professional development, educators struggle to integrate GE principles effectively into their courses. Additionally, Miralles-Cardona et al. (2025) highlight the absence of operational equality plans as a key barrier. While the university has developed such plans, they often fail to translate into concrete teaching and learning strategies. The lack of clear guidelines, assessment mechanisms, and structured professional development further
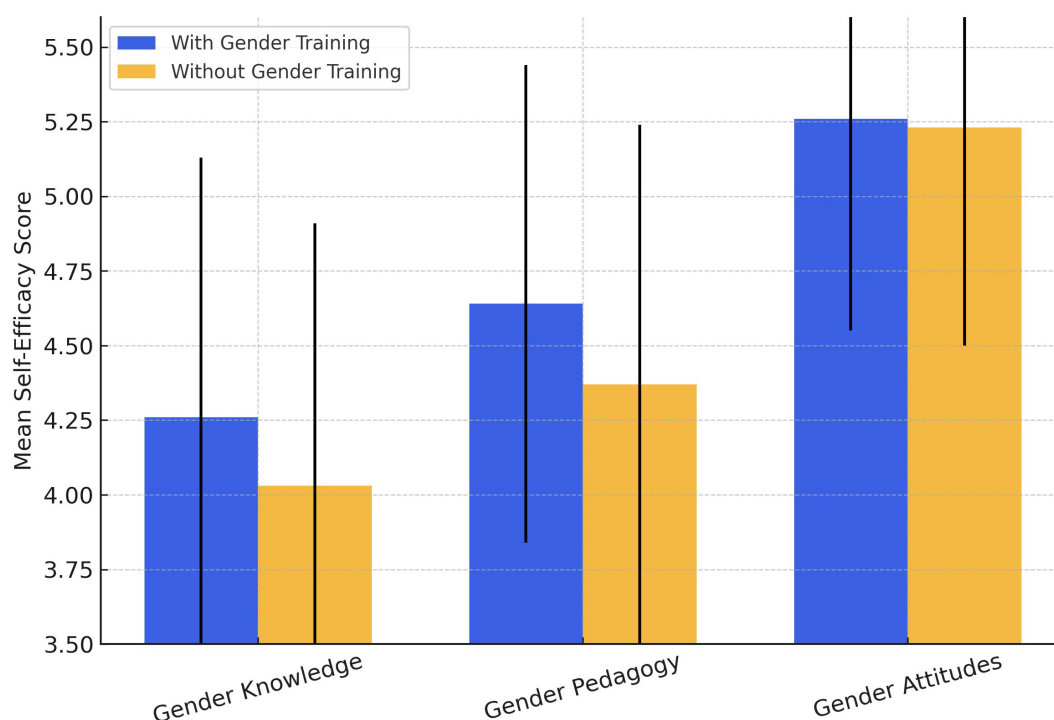
FIGURE 3
Comparison of self-efficacy for GE practice between gender trained and untrained respondents.

weakens their implementation, leading to inconsistencies across academic departments. Limited interdisciplinary collaboration may also hinder the mainstreaming of gender-responsive pedagogies. Without interdisciplinary working groups and cross-departmental cooperation, gender-related initiatives remain isolated rather than institutionally embedded. This lack of integration prevents the university from fostering a truly gender-sensitive academic environment. To overcome these barriers, the UA must strengthen institutional commitment, enforce gender policies more effectively, and provide ongoing professional development. Only through systematic policy enforcement, faculty training, and cross-departmental collaboration can GM become an integral part of university education. Overall, the findings derived from RQ1 are consistent with existing literature, which underscores the precarious state of GRT (Cavaghan, 2017; Miralles-Cardona et al., 2020; Rodríguez-Jaume and Gil-González, 2021). These results also reinforce studies that highlight the lack of curricular, pedagogical and institutional commitment to GM (Aikman et al., 2005; Dumbuya, 2023; Grünberg, 2011; Rands, 2009).

The findings related to RQ2 further underscore the severity of the issue, demonstrating that GT has a direct and positive impact on students' perceived ability to teach using a gender-responsive approach. The comparison of mean scores in the "Gender Knowledge and Gender Pedagogy" factors showed that pre-service elementary and secondary school teachers who received GT perceived their gender capacity in these dimensions as significantly higher than those who did not receive specific training on gender issues ($M = 4.26$ vs. $M = 4.03$ and $M = 4.64$ vs. $M = 4.37$), respectively. Yet, this difference in means was not statistically significant. This finding is further supported by the observed moderate positive association between Gender Content

Taught and perceived ability in Gender Knowledge and Gender Attitudes. Specifically, the relationships account for a meaningful proportion of the variance in self-efficacy for gender-equitable practice, suggesting that as exposure to gender-responsive training increases, future teachers' perceived competence in Gender Knowledge and in fostering Gender Attitudes also improves. It is important to note, however, that none of the item-level differences or associations remained statistically significant after applying the Bonferroni correction for multiple comparisons, highlighting the need for cautious interpretation. No statistically significant association was found between GRT Methods and self-efficacy for GE practice in any of its dimensions. These results can be attributed to the fact that Gender Responsive Teaching Methods are complex and require a deeper understanding of gender issues, which educators may not yet have mastered. Teacher educators may lack sufficient training, support, and experience in these methods, as they are often less integrated into teacher preparation programs. The use of these methods necessitates a shift in teaching practices, including curriculum adaptation and adjustment to diverse student needs, which can be overwhelming for educators and hinder their confidence in effectively applying them in the classroom. In summary, while exposure to Gender Content Taught enhances teachers' confidence in their knowledge and ability to address gender-related issues, the more complex and nuanced nature of Gender Responsive Teaching Methods may require additional support, practice, and experience to significantly impact self-efficacy. Teachers may need more structured and continuous development in applying these methods to feel confident in their use. Overall, these findings are consistent with existing literature, including studies conducted in Spain (e.g., Aznar-Martínez et al., 2025; Resa, 2023; Sanabrias-Moreno et al., 2022) and other

TABLE 4 Association between GRT and perceived self-efficacy for GE practice.

Gender responsive teaching (GRT)	GK	GP	GA	Overall TEGEP
Gender content taught	0.540**	0.293	0.354*	0.460**
Gender-responsive teaching methods	0.249	0.076	−0.036	0.158
Overall GRT	0.465**	0.220	0.195	0.366*

GK, gender knowledge; GP, gender pedagogy; GK, gender attitudes. *Statistically significant at 0.05. **Statistically significant at 0.01.

European countries (e.g. Engeli and Mazur, 2018; Grenz et al., 2008; Weiner, 2000), which underscores the limited impact of gender pedagogy in teacher education. In this context, the present study contributes further by offering insights into the gender content and methods employed by educators at the UA who incorporate a gender perspective into their teaching, while also revealing the gap in the use of more interactive and exploratory teaching methodologies. This study is also noteworthy for its innovative nature, as it is one of the first to explore not only the curriculum but also GRP—two critical areas that require greater attention in teacher education programs. Further research should explore the impact of different methods by analyzing how they may affect various aspects of self-efficacy for GRT.

Limitations

The interpretation of the findings must be considered within the scope of several limitations. First, the study relied on cross-sectional data, which does not allow for causal inference. Although the research aimed to analyze whether GR teaching influences self-efficacy for gender-equitable practice, the use of a non-experimental, causal-comparative design prevents the establishment of cause-and-effect relationships between the variables analyzed. Consequently, the findings should be interpreted with caution. Additionally, factors such as the teaching experience of faculty members, their prior training and background in gender studies, and the nature of the subjects they teach (some of which may be more conducive to integrating gender topics than others) were not controlled for in this study and could have influenced the results. Second, the study was conducted with a non-representative sample of pre-service teachers, characterized by a gender imbalance (predominantly female participants) and limited representation of the broader student body, academic levels, and educational programs within the UA College of Education. This restricts the generalizability of the results. The underrepresentation of male participants (24%), particularly in the final year of their program, and the absence of students from early childhood education further limit the scope of the conclusions. It is possible that a more balanced sample would have yielded different outcomes. Third, the findings are based solely on the perspectives of pre-service teachers, excluding insights from teacher educators who may hold different views on GRT. Faculty perspectives on the challenges of implementing a gender-inclusive approach—such as limited training in gender issues, the lack of institutional guidelines, and insufficient experience or support—are not captured in this study. This omission prevents a holistic understanding of the perceptions of all stakeholders involved in the teaching-learning process. A more comprehensive analysis comparing the views of both student teachers and faculty would strengthen the validity of the findings. Finally, the study was carried out at a single institution and relied on self-reported data from pre-service teachers, predominantly quantitative in nature. This introduces the potential for response bias, as participants may overestimate their self-efficacy or the extent to which gender-related topics and methods are integrated into their coursework. To address this limitation, future studies should consider expanding the sample to include multiple institutions, programs, and academic levels. Additionally, adopting a mixed-methods approach and incorporating multiple perspectives would allow for a deeper exploration of how respondents interpret and attribute meaning to the issues examined.

Practical implications and recommendations

Given the limited research on GRT in teacher education, there is an urgent need to transform both curricula and pedagogy to promote gender inclusivity (Aikman et al., 2005). The findings of the present study reveal both strengths and gaps in how gender-related topics are integrated into teacher training. While some content areas, such as gender-based equal opportunities and gender gender-based violence, are frequently addressed, other critical topics (gender identity, power dynamics, and gender inequalities) are not as consistently covered. Additionally, the predominant use of lecture-based teaching suggests that more interactive and participatory methods could be incorporated to enhance engagement and understanding. The findings also highlight universities as key stakeholders in addressing this issue, yet a clear lack of institutional commitment persists in integrating GM into faculty missions and policies. Degree programs, curricula, course syllabi, and pedagogical approaches remain largely disconnected from legislative mandates, despite existing legal requirements. Additionally, the insufficient GT of faculty members further impedes the effective implementation of GRT. This gap not only slows progress but also reinforces misconceptions about GE and perpetuates stereotypical gender norms.

Based on these findings, several implications and recommendations for policy and practice in initial teacher education, professional development, institutional accountability, and research are outlined. The results indicate that GRT is inconsistently integrated into teacher training programs. While topics such as gender-based equal opportunities and gender inequalities are frequently included, foundational concepts like the principles of GE and power-based abuse are less consistently covered. This suggests a need for stronger curricular guidelines to ensure that all teacher education programs incorporate a

comprehensive and structured gender curriculum. Faculty training is also essential to teach gender-responsive topics. Institutions must provide ongoing professional development to ensure that faculty across disciplines are equipped to integrate GRP effectively.

The study also highlights a heavy reliance on lecture-based teaching methods, with more interactive approaches such as case studies, project-based learning, and guided discovery being used less frequently. This reliance on traditional methods may limit the effectiveness of gender-responsive education. For this reason, the use of interactive teaching methods in initial teacher training is highly recommended, as these approaches actively engage learners, enhance critical thinking, and foster deeper understanding. Compared to lecture-based methods, interactive strategies such as case studies, project-based learning, research-based instruction, and guided discovery allow future educators to experience GRT firsthand. These methods help pre-service teachers internalize key gender concepts, critically analyze biases, and develop practical skills to implement inclusive teaching strategies in their own classrooms. Implementing interactive teaching methods in initial teacher training requires a shift in curriculum design. Teacher education programs should integrate experiential learning opportunities where pre-service teachers can design and deliver gender-responsive lesson plans, analyze classroom dynamics through case studies, and engage in collaborative research on gender issues in education. Faculty should receive training in student-centered pedagogy to ensure they can model these interactive approaches effectively. Additionally, technology-based learning, such as online simulations or virtual case studies, can be incorporated to further diversify teaching methods. Policies should encourage TE programs to adopt more student-centered, experiential learning techniques that allow future educators to engage critically with gender concepts. In addition, training workshops and resources should be developed to support faculty in transitioning to these interactive approaches.

In terms of institutional accountability, the study suggests that while GT positively influences educators' knowledge and pedagogy, institutional support remains inconsistent. Faculty members who have undergone GT demonstrate greater awareness of GE legislation and are more confident in addressing gender stereotypes and discrimination. However, without clear institutional policies and frameworks, the implementation of GRP remains uneven. Universities and accreditation bodies should establish guidelines that mandate gender inclusion in teacher education curricula, teaching practices, and assessments. Institutions should also provide faculty with necessary resources and create networks for peer collaboration to share best practices in GRT. In this sense, mentorship and CoP can play a crucial role in supporting educators as they implement GRP. Mentorship programs can pair novice teachers with experienced educators who have expertise in gender-inclusive teaching, providing guidance, feedback, and support in navigating classroom challenges. This one-on-one support system helps teachers build confidence and refine their approaches based on real classroom experiences. On the other hand, CoPs further enhance professional development by creating collaborative spaces where educators can share best practices, discuss challenges, and develop strategies for integrating GRP. These communities can be facilitated through in-person workshops, online forums, or professional learning networks. Institutions should encourage

participation in such groups by offering structured opportunities for engagement, recognizing contributions to gender-inclusive teaching, and providing access to relevant resources and research. By incorporating interactive teaching methods in teacher training and fostering professional growth through mentorship and collaborative learning, educators will be better prepared to create inclusive and equitable learning environments. These strategies have the potential not only for improving teaching effectiveness but also contributing to a broader cultural shift in education toward gender equity and social justice.

Furthermore, the study points to gender imbalances in teacher training participation, with fewer male pre-service teachers engaging in gender-related education. This suggests a need for targeted strategies to increase male participation in GRP to ensure that all future educators, regardless of gender, are prepared to foster inclusive learning environments. GT should be positioned as essential for all educators, rather than a specialized subject relevant only to certain disciplines.

Finally, further research is necessary to assess the long-term impact of gender-responsive teacher training on classroom practices and student outcomes. Studies should examine how different teaching methods influence educators' ability to implement gender-equitable strategies in real classroom settings. Additional research should also explore how institutional policies can be strengthened to support sustained implementation of GRT practices.

By considering and implementing these targeted recommendations, teacher training programs can better prepare educators to create equitable, inclusive, and gender-responsive learning environments that empower all students.

Conclusion

This study highlights the challenges and gaps in implementing GRP in teacher education at the UA. The findings reveal that while gender-related content is occasionally integrated into coursework, it is neither systematically addressed nor sufficiently emphasized in instructional practices. Furthermore, the study demonstrates that pre-service elementary and secondary school teachers who received GT perceive themselves as more confident in their ability to apply a GRP compared to those without training. However, the absence of significant differences in some self-efficacy indicators suggests that insufficient training may not be enough to foster deep, lasting capacity in GRT. Despite institutional commitments to GE, the limited integration of gender perspectives into teacher education curricula underscores the need for more comprehensive reforms. The UA must move beyond policy declarations and actively embed gender-sensitive content and methodologies into teacher training programs. Additionally, faculty development initiatives are essential to equip teacher educators with the skills and knowledge necessary to implement GRT effectively. Addressing these gaps requires a systemic transformation that includes curricular revision, faculty training, and institutional accountability to ensure that future teachers are fully prepared to promote GE in education. Without sustained efforts to integrate GRP at all levels of teacher education, the broader goal of achieving gender equity in schools and society will remain out of reach.

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 humans were approved by the University of Alicante Ethics 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.

Author contributions

CM-C: Conceptualization, Data curation, Formal Analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Validation, Visualization, Writing – original draft, Writing – review and editing.

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Conflict of Interest

The 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.

Generative AI statement

The author(s) declare that no Generative AI was used in the creation of this manuscript.

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