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Breaking the silence: Norwegian teachers' perspectives on adapting language environments for AAC users

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Introduction: Many children experience challenges and limitations in spoken language, necessitating the use of alternative and augmentative communication (AAC) to communicate effectively. Learning to communicate with AAC involves a systematic training process, and it is essential to adapt the language environment to meet the specific needs of AAC users. The study aims to enhance knowledge on establishing a positive language environment for children using AAC.

Methods: A qualitative approach was employed, involving three semi-structured interviews with teachers from three distinct units within the same county in Norway. The interviews focused on elements such as teachers' knowledge and skills in AAC, communication partner and language model, use of communication materials and aids, and attitudes toward AAC.

Results: Key findings highlight that teachers' knowledge and skills in AAC, the role of communication partners and language models, the availability and use of communication materials and aids, and positive attitudes significantly contribute to creating a positive language environment for children using AAC. These elements enable effective communication and support language development.

Discussion: A combination of knowledge and effective organization is essential for prioritizing the creation of a positive language environment. This, in turn, enables children who use AAC to develop and acquire practical language skills that they can use throughout their lives. The study underscores the importance of systematic training, supportive attitudes, and tailored communication resources in enhancing the language environment for AAC users.

KEYWORDS

special education, children, augmentative and alternative communication, language environment, Norwegian teachers' perspectives, inclusive communication strategies

Introduction

Language acquisition is crucial for children's development (Hoigård, 2004, p.14). Differentiating between language and speech is essential. Various types of language exist regardless of the sensory mode used. Some people require the use of alternative and augmentative communication (AAC) if verbal language is inadequate (Tetzchner, 2019, p. 276).

AAC encompasses all forms of communication assistance, including gestures made independently or with the aid of a communication device. Learning to communicate with AAC involves a systematic training process (Østvik, 2008a). The language environment of the AAC user must be adapted to suit their specific needs.

Many individuals experience growing up in a language environment where they have limitations in spoken language, either partially or completely (Blackstone and Berg, 2003). Studies

indicate that between 0.4 and 1.2 per cent of the population needs augmentative and alternative communication (AAC) (Tetzchner, 2019, cited in Karlsen and Næss, 2015, p. 5). In a report to the parliament on learning and cohesion, it is pointed out that approximately 6,500 children aged 1–18 in Norway cannot use speech as their way of communicating (Meld. Stanza 18, 2011, line. 83). It is challenging to determine the exact number of children who use AAC in Norway.

When individuals using AAC need to engage in society at the same level as others, they face a bigger obstacle. They require the surrounding environment to be organized for their benefit. AAC users require a specialized language environment to mature and acquire a practical language for lifelong use. This language setting needs to include multiple individuals who communicate in the same way as the person in question. In the context of communication, there should be language models who are more skilled communicators than the AAC user. For AAC users to be fully included in a school setting, it is crucial for other students to also utilize the same communication method (Tetzchner and Martinsen, 2014, p. 310). AAC users require a supportive language environment to feel a sense of belonging, communicate effectively, establish an identity, and engage with the community.

The main goal of this research is to examine teachers' perspectives on the language setting for individuals using AAC in special education. Inquiries for research: *What experiences do teachers go through when establishing a positive language environment for children with special needs who utilize alternative and augmentative communication?*

A lot of AAC users attend their nearby school and are, to different extents, involved in a classroom environment. Multiple specialized departments are associated with nearby schools, which house numerous AAC users within their group. The language setting in a community school with an AAC student will vary compared to a specialized department where all students use AAC. This research examines the linguistic atmosphere within specialized departments that cater to groups consisting solely of AAC users.

Communication

The word *communication* comes from the Latin word *communicare* and means “to make common.” Communicating is an interaction that takes place between people (Næss, 2015, p. 16). It has always been important for people to communicate with other people. We can communicate with language or signs and it acts as a link between people. The United Nations claims that communicating with the outside world is a basic need and a human right to communicate (Von Bernstorff, 2008). By communicating with others, we can express feelings, thoughts, intentions, attitudes, answer questions or comment on others' statements (Postholm, 2005, p. 68). We use speech, sounds, gestures, body language and facial expressions during communication, which means that communication is multimodal. One can also communicate with aids that are non-electronic or electronic (Blackstone and Berg, 2003, p. 12).

People who, for various reasons, have problems with communication, have a communication difficulty. The term communication difficulties are a collective term because the cause of the difficulty and the degree of difficulty vary in severity from person to person. Difficulties with communication can be acquired or developmental (Næss, 2015, p. 25). There are two primary categories of language challenges. The initial category consists of individuals with particular language challenges that are primarily caused by their linguistic issues. The language challenges

in the second group stem from a developmental disability that is not the primary cause (Rygvdal, 2004, p. 202). In this research, the participants collaborated with children who use AAC and experience varying degrees of communication challenges.

People who cannot communicate with spoken language must communicate in another ways use augmentative and alternative communication (AAC). People may be born with an illness, condition or an injury that makes them unable to use verbal speech in communication. The way all people express themselves is language (Statped, 2024). There are great differences between AAC users, but the common denominator is that they need an alternative form of communication that must supplement or replace spoken language (Tetzchner and Martinsen, 2014, p. 2). When finding the right form of communication for an AAC user, there are several aspects that must be considered. When choosing a communication aid, it is important to carry out a survey to get some answers on mobility, communication skills and the AAC user's expected development (Næss, 2015, p. 29).

Tetzchner and Martinsen (2014), leading theorists in Norway, categorize AAC users into three main groups. The group of expressive means comprises AAC users who comprehend spoken language well but cannot communicate using it. The AAC users in this group will rely on their AAC device indefinitely. The language support group utilizes AAC to aid in the development of spoken language. The AAC form of communication is temporary, not permanent. The language alternative group consists of AAC users who communicate using AAC as their primary language. Communication partners must utilize the appropriate form of communication when interacting with the AAC user (p. 66).

If an AAC user needs a talking AAC device, touchpad or computer AAC, it is called aided communication. When the way in which the AAC user communicates is a physical form separate from himself and the communicative expression is the picture or drawing, then pointing to the AAC aid is aided communication. Unaided communication is when the AAC user is able to perform the linguistic expressions themselves. Hand signs are the main form in this category, but eye blinking can also be unaided communication. There is dependent communication if the communication partner must put together or interpret what is being communicated. With independent communication, the AAC user can formulate what is communicated themselves, independently of the communication partner (Tetzchner and Martinsen, 2014, p. 8, 9).

An important element for communicative development in people is a language environment where you get linguistic stimulation as a result of access to other people's use of the language (Kunnskapsbanken, 2024). AAC users need to be exposed to other uses of language and given the opportunity to communicate themselves. Østvik has looked at the concept of language environment and looked at what different components a language environment consists of. He has broken down the language environment into eight categories which are illustrated below:

Eight components of language environment (Østvik, 2008b):

- Conceptual understanding
- Communication partners
- Physical environment
- Communication materials and aids
- Meaningful and motivating activities, theme, situations and environment
- Language models
- Barriers
- Attitudes

Conceptual understanding

The understanding the people in the language environment have of the AAC user's language. Sign language, spoken language and other forms of non-verbal communication are languages. How one understands the concept of language will have an impact on how we facilitate communication for AAC users (Østvik, 2008b) (Figure 1).

Terminological considerations in defining AAC

The terminology surrounding Augmentative and Alternative Communication (AAC) reflects varied theoretical perspectives and disciplinary conventions. In this article, AAC is described as a form of non-verbal communication, emphasizing its distinction from spoken language. However, it is important to acknowledge an alternative perspective where AAC, due to its symbolic nature, may be categorized as non-vocal (or non-oral) verbal communication.

Verbal communication is often defined as the use of structured symbolic systems to convey meaning (Von Tetzchner and Martinsen, 2002). AAC systems, such as communication boards, speech-generating devices, or manual signing, rely on structured symbols and syntax, aligning them with this definition. Thus, AAC could be described as verbal communication that substitutes or supplements oral expression. This interpretation emphasizes the linguistic and cognitive dimensions of AAC, supporting its role in fostering language acquisition and interaction.

In this study, however, the term “non-verbal” is used to highlight the non-oral characteristics of AAC and to maintain consistency with its practical focus on educational and communication strategies for AAC users. By adopting this terminology, we align with frameworks commonly employed in special education (e.g., Blackstone and Berg, 2003; Østvik, 2008b) while recognizing the validity of alternative terminological choices.

Including this clarification provides readers with a nuanced understanding of AAC's dual classification as both verbal (symbolic) and non-verbal (non-oral) communication. This distinction is critical for framing educational practices and policies that accommodate diverse conceptualizations of AAC.

Communication partners

The person who communicates with AAC users is called a communication partner, and is the most important resource for achieving good communication for AAC users (Østvik, 2008b). The Directorate of Education claims in the AAC guide that those who work in schools should have AAC knowledge and skills. Employees must recognize that AAC is as valuable and important as spoken language (Utdanningsdirektoratet, 2023). There are several AAC users who do not feel that their form of communication is used in their language environment (Karlsen, 2020, p. 85). Many people in the language environment of AAC users have no or little knowledge and experience with AAC; this also applies to teachers (Beukelman and Light, 2020, p. 136).

The person who has the greatest responsibility for facilitating communication and for the communication process itself is the communication partner (Næss, 2015, p. 32). Typical patterns of communication between AAC user and communication partner are that the communication partner is often dominant. They set a lot of guidelines for communication, ask yes/no questions, can interrupt often, have the focus on the technology, rarely confirm the content of what is being communicated and do not always give the AAC user the opportunity to answer (Blackstone and Berg, 2003, p. 13). One must have patience and dare to wait, then the probability that the AAC user will show initiative in communication will be greater (Tetzchner and Martinsen, 2014, p. 165). AAC users are more likely to develop learned helplessness and stop responding, which occurs when the AAC user does not believe that their response has an impact on the surrounding



FIGURE 1
Language environment (Kunnskapsbanken) (Østvik, 2008b).

environment (Feeley and Jones, 2011, p. 280). Communication partners must tolerate silence, confirm and interpret, be motivated, patient and interested in the AAC user (Næss, 2015, p. 32).

Physical environment

The physical framework in which the AAC users are located constitutes the physical environment. Access to communication materials and aids, and communication partners is important for communication. The organized activities must be made possible for participation and adapted to AAC users. One must work to ensure that the physical environment does not hinder communication (Østvik, 2008b, p. 19). In article § 9–3, it is specified that pupils have the right to learning materials, inventory and necessary equipment (Directorate of Education, 2021).

Communication materials and aids

The aid with which the AAC user communicates must be available at all times (Thunberg, 2015, p. 120). The people in the surrounding language environment must see the importance of the communication aid being easily available, at all times and with all communication partners (Tetzchner and Stadskleiv, 2016, p. 20). In the UN Convention on the Rights of Persons with Disabilities (CRPD - Convention on the Rights of Persons with Disabilities) in chapter nine, which deals with accessibility, it is specified that people with disabilities must have access to communication on an equal basis with other people (UN, 2008).

Meaningful and motivating activities, theme, situations and environment

We get to know the outside world by participating in activities and situations that engage us. By unfolding ourselves in the world, we learn what possibilities we have. We feel that we can influence and take control. Great demands are placed on the people in the environment around AAC users to make communication, participation and learning possible. Employees who work in schools must facilitate learning and have special knowledge about this for AAC users (Slåtta, 2021, p. 98). It is important that AAC users are in a language environment that facilitates communication, interaction and learning. AAC users must be allowed to use their form of communication in motivating and meaningful activities (Østvik, 2008b, p. 20).

Language models

There must be language models in the language environment so that the AAC users receive linguistic stimulation. There must be people in the language environment who model and are more linguistically competent than the AAC user. In this way, the AAC user can imitate, learn and experience their form of communication in use (Østvik, 2008b, p. 20). The AAC user is exposed to communication based on their level of development, and can in this way develop vocabulary, understanding of concepts, language content, form and its use in practice (Karlsen, 2020, p. 93).

Many school staff lack knowledge of communication aids and experience in using them, which makes them good language models (Karlsen, 2020, p. 85). The staff in the school must receive training and the opportunity to use the different forms of communication. That could be a good use of money and time to provide good training to the people in the language environment of AAC users (Tetzchner and Martinsen, 2014, p. 322).

Barriers

Barriers in the language environment are factors that limit the possibility of communication for AAC users. The UN Convention points out barriers that prevent AAC users from participating in society effectively, and uses the terms “environmental barriers” and “attitudinal barriers.” The people in the language environment should work toward creating change to minimize or remove barriers (Østvik, 2008b, p. 21). If one manages to uncover barriers, these might transform into opportunities (Skogdal, 2015).

Attitudes

The employees within the language environment of AAC users can promote or inhibit development with their attitudes. The best way to combat barriers is the attitudes, and they are reflected in our expectations of communication and what we believe are important aspects in a language environment. How inclined the employees are to change their own practice in order to promote a good language environment for AAC users is shown in their attitudes (Østvik, 2008b). In CRPD chapter eight it is stated that one must “promote positive attitudes toward and have greater societal awareness of people with disabilities” (UN, 2008).

Methods

This study has a qualitative approach, as it is based on human experiences. The informants are three teachers who work with AAC users and create a positive language environment for them. It is their experiences and reflections that are highlighted. A qualitative research interview has been conducted where the purpose is to obtain information from the informants about their life world, and then to interpret the empirical evidence (Kvale and Brinkmann, 2017, p. 22). As an attempt to include most relevant topics, an interview guide was prepared. The interview was semi-structured, as it gave more flexibility in the interview situation. The selection was criteria-based, as it was of crucial importance that the informants were teachers who worked with AAC users in a specialized department. After the interview, complete transcriptions were carried out, and Østvik (2018) eight components for the language environment were chosen as categories for the interpretation and analysis process.

Informants

All three participants are women, and to preserve their anonymity, fictive names have been assigned (Table 1).

TABLE 1 Participants' profiles and backgrounds.

Informant (Fictive names)	Education	Number of years worked as a teacher	Number of years working with AAC
Anne	Child Protection Pedagogy (bachelor) Special pedagogy (master) AAC	5 years	10 years
Bente	Social worker (bachelor) Sports Pedagogy Guidance AAC	8 years	8 years
Celine	Teacher AAC	16 years	16 years

Semi-structured interviews

The study includes a semi-structured interview guide (see [Appendix 1](#)) designed to explore teachers' experiences in promoting effective language environments for students utilizing augmentative and alternative communication (AAC). The interviews were conducted at the teachers' workplaces, specifically within competence departments in the same county in Norway. The duration of the interviews ranged from 30 min to an hour, as is common for semi-structured interviews. All interviews were conducted by the same researcher, ensuring consistency in data collection. The study employed a qualitative methodological approach, grounded in phenomenology and hermeneutics, to investigate the subjective experiences of participants and provide an interpretive analysis of the data. The three participating teachers represented diverse educational levels, including primary, secondary, and high school settings. Key themes of the interview guide included teachers' experiences with facilitating language environments, challenges encountered in supporting AAC users, strategies for overcoming barriers, and reflections on the roles of communication partners and physical environments.

Ethical considerations

Ethical guidelines and guidelines have been followed according to [Postholm \(2005\)](#) to ensure that the research process ([Postholm, 2005](#), p. 145). The national research ethics committee (NESH) has ethical guidelines that apply to research. Three important considerations to take are that those who participate in the research should not be harmed by participating, the informants' right to self-determination and that researchers respect the informants ([Johannessen et al., 2021](#), p. 45). In the study in question, approval has been sought from SIKT - the knowledge sector's service provider. The participants received all the necessary information concerning the current study.

Results and discussion

The current research focuses on what experiences teachers go through when establishing a positive language environment for children with special needs who utilize alternative and augmentative communication.

All informants work daily at a school with students who need augmentative and alternative communication (AAC) and possess great expertise when it comes to creating a language environment that is adapted to AAC users. Their experiences and reflections have been highlighted to support their view of the language environment for AAC users. The following elements were identified as essential for this study:

Knowledge and skills in AAC

The Norwegian Directorate of Education highlighted the importance of school staff having skills and knowledge of AAC ([Utdanningsdirektoratet, 2023](#)). [Tetzchner and Martinsen \(2014\)](#) highlight that staff must be given the opportunity to use AAC and receive training in AAC. The training is necessary to get competent staff to use AAC. Bente says that working to increase the competence at AAC must be fixed in the timetable, otherwise the staff will not be able to do it. Management must prioritize training in AAC, in order to increase knowledge and skills. The informants point out that there should be an AAC manager in each specialized department, which all the informants confirmed existed at their place of work. The informants pointed out reasons why there may be little AAC skills and knowledge among the employees could be the management's attitudes toward the importance of training and further education, and how much time the management sets aside to increase AAC knowledge and skills during working hours. The informants want more time to practice with the employees and share experiences.

The informants also pointed out that the employees themselves must want to increase their knowledge and skills. Bente says that the staff can also be a barrier, if you do not bother or find it stressful to learn the communication aids. It is not only knowledge and skills in relation to the practical use of communication aids that are important, but one must also have knowledge of the application process, be familiar with relevant material and available symbols.

It is crucial to have knowledge and skills about AAC if one is to manage to create a good language environment for AAC users. Staff must be given time for practical tasks around AAC, share experiences and practice with other staff. The staff need further education and courses in AAC to increase their competence.

Communication partner and language model

There must be people in the language environment who model the form of communication that the AAC user uses. In this way, the AAC user can learn, imitate and experience (Østvik, 2008b).

The informants shared many good reflections and experiences around this topic. Bente says that it is the employees' job to use the communication aids to the greatest extent possible. We must model, model and model. Celine agreed and added that if the AAC users are to learn to use communication aids, there must be AAC competence among the staff. Tetzchner and Martinsen (2014) say that more AAC users become communicative underachievers. This is because there is a lack of skills and knowledge about communication aids in the language environment, which leads to a lack of communication opportunities. Bente claims that the employees must know where to find the words in the communication aid. *«You cannot sit and browse and not find out yourself. In advance, you have to practice, try yourself out and really get to know the communication aid.»*

Anne also said that the adults must point, point, point and point, in the same way as we talk, talk and talk to a small child. We must model and be good language models. Celine goes further and says that in an ideal world, the employees would use AAC when speaking to each other too, so that the AAC users are bathed in language, just as children are bathed in verbal speech. AAC users need to see that their form of communication is being used. The staff must also be realistic, patient and celebrate the small advances in the language development of AAC users.

In order to be good language models, knowledge and skills in AAC must be the basis, the findings show. Previous studies also points out the importance of the communication partner having to take greater responsibility and facilitate communication with the AAC user. Bente says that you must have the expectation that you will get a response in communication with AAC users. She claims that *«you have to give the AAC user enough time to respond, be patient and not talk too much yourself, as you often tend to do in communication with AAC users.»* If a communication aid is used in communication, it takes extra time to communicate what you want. The informants were aware of this by giving AAC users time in communication, but were also honest that you do not always have that time at your disposal.

The informants and the literature emphasized that one must be interested, patient and motivated to be a good communication partner. You have to tolerate the silence that may occur and be honest if there is something you do not understand what the AAC user was trying to communicate.

Communication materials and aids

Communication materials and aids must always be available (Thunberg, 2015).

Anne says that she tries to encourage her colleagues to carry communication aids everywhere, dare to remind each other of it, and that they can thus point and model in all situations. She goes on to say that *«we have to bathe the AAC users in language.»* If the employees do not bring the communication aids, they violate what is written in CRPD chapter 12 that AAC material must be available. The informants were very aware of this, and they strive to always have the

communication aid with them, but that it can also be challenging to do at all times.

The informants had different ways of having communication material available at their workplaces. Two of the schools have large AAC boards with symbols outside in the schoolyard so that students from the competence department and the local school can use them. This creates a common focus and attention on AAC in the school. All the informants had symbols on them, either in the form of aprons with Velcro with symbols or key rings around the neck with symbols. All classrooms and other living spaces have blackboards and boards with accessible symbols.

Both the literature and the informants claim that it is important to communicate about what you want and with whom you want. When choosing a communication aid, there are several factors that must be considered, and the various aids have advantages and disadvantages. Celine says that not all communication aids can withstand all kinds of weather. Anne explained that it can be easier to use sign-to-speech if you have to give a message to something far away, instead of a symbol that you have to be close to in order to communicate with it. The advantage of symbols is that many people who do not know AAC can understand symbols, while sign-to-speech is something you have to know. The different communication materials and aids cover different needs.

Availability is also affected by materials disappearing, a lack of licenses, aids running out of power, technical problems arising or being destroyed, say the informants. The communication aids must also be always updated, so that the AAC user has the opportunity to develop his language. Anne says that it is important to show the AAC users that they keep the communication aids up to date and show that they are important and use them. Both the literature and the informants point out that there must be one person who has primary responsibility for the communication aid.

Attitudes

A person's attitudes reflect what one considers important in a language environment. This once more highlights our anticipation for communication and the readiness to modify our own methods to enhance the language setting for AAC users (Østvik, 2008b). Being aware of one's own attitudes is necessary when working on one's mindset. Celine openly admits that attitudes are the most difficult thing to address and the most challenging to deal with. She also emphasizes the importance of comprehending why you need to do certain tasks, rather than simply following instructions, in order to perform more effectively. Employees need to be knowledgeable of the goal, understand their choices to reach the goal, and grasp the significance of their work. Those who assist AAC users should consider their own attitudes toward AAC. This should be carried out independently, within the team one belongs to, or with the support of the administration.

What view one has of communication affects how we communicate and work with communication. The employees must, according to the AAC guide (2023), recognize that AAC is just as valuable and just as important as communication with verbal speech. Bente believes that we must think of AAC as the student's language. The attitudes we have toward AAC and toward the communication aid are important. Celine points out that the employees who have the attitude that this is a job they want to do, are

TABLE 2 Summary of the main findings of the study.

Key findings	Summary	Recommendations	Congruence/discordance
Knowledge and skills in AAC	Staff need consistent training and knowledge of AAC, practical use, application processes, and material knowledge. Challenges include management's attitude and time constraints.	Management should prioritize AAC training, allocate time for practice, and appoint AAC managers in departments.	<i>Congruent:</i> All informants agree on the need for consistent training and noted similar challenges.
Communication partner and language model	Staff must model AAC communication extensively to help users learn. Effective communication requires patience, practice, and realistic expectations.	Staff should practice AAC tools, model communication consistently, and remain patient to support AAC users' learning.	<i>Congruent:</i> All informants emphasize the importance of modeling and agree on the need for staff competence.
Communication materials and aids	Communication aids must be accessible, maintained, and updated. Examples include large AAC boards and portable materials like Velcro symbols.	Ensure consistent availability of aids, assign responsibility for maintenance, and encourage use in diverse settings.	<i>Mostly congruent:</i> All informants stressed availability, though specific approaches to implementation varied slightly.
Attitudes	Positive attitudes toward AAC are essential. Staff must value AAC as equally important as verbal speech and remain motivated and reflective.	Foster positive attitudes through reflection, team discussions, and administrative support to enhance AAC integration.	<i>Partially congruent:</i> Informants agreed on the importance of attitudes but highlighted varying levels of staff motivation and challenges in fostering reflection.

the people who need to work with AAC users. Lack of understanding of why it is important can hinder a good language environment. Our attitudes can be directly reflected in the access AAC users have to their language. Anne says that if someone thinks that this child cannot communicate, then there is little point in communicating with that child. That AAC users can understand and make themselves understood is extremely important. AAC users must be given the opportunity to express their thoughts, needs and feelings. Bente points out that the student does not have the opportunity to communicate if the adults do not bother to take communication aid with them. If you have an attitude that AAC is not that important, then AAC users will not be able to communicate what they want. The attitudes one has toward AAC aids are decisive for what we put into it.

AAC users are raised in a society where most individuals communicate verbally, so educators must ensure that language is easily understandable for AAC users in school settings. According to the CRPD, it is important to encourage positive views of individuals with disabilities. Working on our attitudes presents a wonderful chance to reduce or eliminate barriers in the language environment of AAC users. Employees need to be conscious of the topic of attitudes, despite the challenge of discussing it. The participants concurred that the motivation to assist AAC users, along with the mindset toward the task, impacts the quality of work done, ultimately shaping the language atmosphere for AAC users.

Summary of findings and recommendations for AAC implementation

The table below summarizes the key findings from the study, highlighting the identified themes and corresponding recommendations for enhancing the language environment for AAC users. Additionally, the table includes an assessment of congruence or discordance among the three informants, illustrating the degree of agreement on each theme based on their reflections and experiences. This presentation provides a clear overview of the results while contextualizing the perspectives of the participants (Table 2).

Conclusion

Teachers and other staff members at the school are obligated to create a supportive and stimulating language and learning atmosphere for children with special needs overall, especially those who use AAC.

A combination of knowledge and organization is key in prioritizing the wellbeing of these children. Furthermore, it appears that serving as an effective language model and communication ally enhances language and communication acquisition for AAC users. Adults in the school, including educators, need to be proficient in AAC to effectively introduce it to the students. The AAC user's language needs to be current and accessible constantly. Furthermore, educators need to acknowledge that AAC is equally valuable and crucial compared to verbal communication, and they must maintain a positive attitude in their everyday teaching.

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 Norwegian Agency for Shared Services in Education and Research. 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

SE-E: Conceptualization, Data curation, Formal analysis, Investigation, Writing – original draft. IB: Validation, Visualization, Writing – review & editing. MP: Validation, Visualization,

Writing – review & editing. SC: Conceptualization, Supervision, Writing – review & editing.

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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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Appendix

Interview guide

Introduction

- Brief introduction of the researcher and the purpose of the study.
- Explanation of the participant's rights, including confidentiality and voluntary participation.
- Request for permission to record the interview.

Main topics and questions

1. Experiences with Language Environments

- Can you describe your experiences with facilitating a good language environment for students using AAC?
- What do you consider to be the key factors in creating an effective language environment?

2. Challenges

- What challenges have you encountered when working to support students who use AAC?
- How do these challenges impact your ability to facilitate a good language environment?

3. Strategies and solutions

- What strategies have you employed to overcome these challenges?
- Are there specific methods or tools that you find particularly effective in supporting students with AAC needs?

4. Communication partners

- How do you perceive the role of communication partners in the language environment?
- What is your approach to engaging peers, teachers, or other staff as communication partners?

5. Physical environment

- How does the physical environment influence the language opportunities for students using AAC?
- Can you provide examples of adjustments or changes made to the environment to support AAC users?

6. Reflections and recommendations

- Based on your experiences, what recommendations would you give to others working with AAC students to improve language environments?
- Are there specific resources or support systems you feel are lacking or needed to enhance your work?

Closing

- Is there anything else you would like to add or highlight about your experiences with AAC students and language environments?
- Thank the participant for their time and contributions.