



Language and Literacy Education in Austria: Teachers' Perspectives

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

This study examines the critical role of language and literacy in educational contexts, emphasizing their significance in human development and social inclusion. Drawing on a diverse range of literature and research, this study explores the interconnectedness of language acquisition, literacy development, and educational practices. Highlighting language and literacy as fundamental human rights, this study underscores the importance of inclusive and equitable education. Through qualitative methods, including online questionnaires (n=18) and interviews (n=8) with teachers, this study investigates the implementation of language and literacy education in Austrian primary schools as well as the challenges faced by educators in this domain. The findings reveal diverse teaching methodologies employed by teachers, ranging from shared book reading to digital tools, while also identifying obstacles, such as multilingualism, professional training deficiencies, and student engagement issues. The study's findings strongly support the need for targeted interventions to improve educational outcomes. Specifically, the challenges identified—particularly multilingualism and training gaps—underscore the necessity of ongoing professional development

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tailored to teachers' specific needs. Enhancing teacher training programs with a focus on multilingual pedagogy and culturally responsive teaching can directly address these obstacles. Furthermore, the findings suggest that improving student engagement requires innovative and adaptable teaching methodologies, such as integrating digital literacy tools more effectively into the curriculum.

Keywords: Language education; literacy; qualitative design; descriptive analysis.

1. INTRODUCTION

Language and literacy are intertwined and crucial for development across a lifespan [1]. From a social perspective, acquisition refers to opportunities for participation in social life and society. It also makes it possible to lead a self-determined life [2,3]. Therefore, it is not surprising that the acquisition of language and literacy is declared a human right [4,5]. Goal 4 from the social sustainability goals: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all refers to its importance and to the responsibilities of education to provide possibilities for acquisition [6]. Due to partially binding international policies such as the UN Convention on the Rights of Persons with Disabilities, Austria, ratified in 2008, the school context has become increasingly important in these issues [7].

Literacy is not just about reading and writing, but also encompasses (oral) language skills [7]. This relationship between language and literacy is also evident in interventions that aims to improve both aspects simultaneously, like in the program "Language and Literacy Together" for bilingual children [8]. In Patricia Oelwein's [9,10] concept of early reading, literacy is used as a core element in promoting early language development [9].

As Alimuddin summarised that "language learning can be used as a medium in literacy development at schools, especially in reading and writing skills. Thus, to improve students' literacy performance, literacy-based language learning strategies need to be adopted including 1) building a literacy culture, 2) encouraging School Literacy Movement, and 3) choosing/implementing the appropriate approach/method [11].

References can be made to a variety of methods for learning languages, reading, and writing skills (for example, Wang [12] Ahern et al. [13] Wijaya et al. [14]. In Vienna, Wilhelm and Walter's [15]

so-called language experience approach has been used for several years as a teaching method. This method was first developed by Johanna Juna in the early 1980s and is based on Bergk's theory [16]. The acquisition of written language is closely linked to communication and interactions between people. Marion Bergk refers to language, writing, and reading as "language action". The acquisition process when learning to read and write is linked to experiences and is seen as the penetration and internalisation of new things. This work is based on early literacy experiences [17] thus enabling pupils to have these experiences from the very beginning and build on them in both literacy and language acquisition.

Lin [18] also refers to these early experiences. Literacy involves not only the acquisition of reading and writing skills but also understanding and producing various forms of discourse, from personal notes to research reports [18]. From a developmental psychology perspective, this shows the importance of reading and writing, which play important roles in early childhood. For example, in kindergarten, children demonstrate the use of writing in everyday situations, such as writing a shopping list that they imitate playfully. The course of these early phases also affects the school process in the acquisition of language, reading, and writing [19].

Teachers employ various approaches to effectively teach their own language and literacy skills. One such approach is the literacy approach, which involves two phases: reception (comprehension) and production (creation) (for example Alvarez Sullo [20] Halbach & Ning [21]. Additionally, shared book reading is a collaborative practice between teachers and speech-language therapists to enhance young children's language and literacy skills [22]. By incorporating teaching strategies, teachers can effectively teach students language and literacy skills. With the knowledge that there are connections between language and literacy, the

question arises of how teachers design lessons, especially at the beginning of school.

More specifically, does language and literacy play a role in the first year of primary school in Austria? Therefore, this paper focuses on the learning processes of language, reading, and writing from the teachers' perspective. Research has highlighted that teachers often lack explicit knowledge of language and literacy [23,24,25]. Additionally, there is growing emphasis on the importance of teachers' knowledge base, encompassing content knowledge, pedagogical content knowledge, and awareness of educational contexts and ends [26].

Therefore, this paper aims to investigate the interplay between language and communication, written language acquisition, and methodological-didactic possibilities, using a qualitative research design. The research questions were as follows.

- What roles do languages and literacy play in school lessons?
- How do teachers implement language and literacy education in their lessons?
- What methods do they use, and how are they used in the classroom?
- What challenges do they face?

With this exploratory study, we aim to demonstrate the significance of language and literacy acquisition as a goal for all students and the challenges it may pose.

2. MATERIALS AND METHODS

This study used a qualitative approach [27]. Due to a lack of knowledge about the research questions and the possibility of gaining a broader understanding of the phenomena, an exploratory online questionnaire was first generated to determine how teachers saw the role of language, written language, and the methods used. Second, structured interviews were conducted to obtain in-depth information.

2.1 Exploratory Online Questionnaire

The survey period was May to June 2022. The online questionnaire was administered by the administration of 22 schools throughout Austria. As a selection criterion, the highest possible heterogeneity of students was chosen (e.g. schools in urban areas, schools with a special focus on communication, and inclusive settings). Furthermore, schools should be chosen in Austria. Although the enquiry was carried out several times, the response rate was very low; 18 teachers filled out the questionnaire in full. Therefore the results should be seen in that context. Several cases have been reported, owing to the research design. Owing to the open questions (see Appendix A), a descriptive analysis was conducted as an evaluation method [28].

2.1.1 Sampling

The average years of service for the 18 teachers was 19.5. The time span ranged from two to 27 years of service.

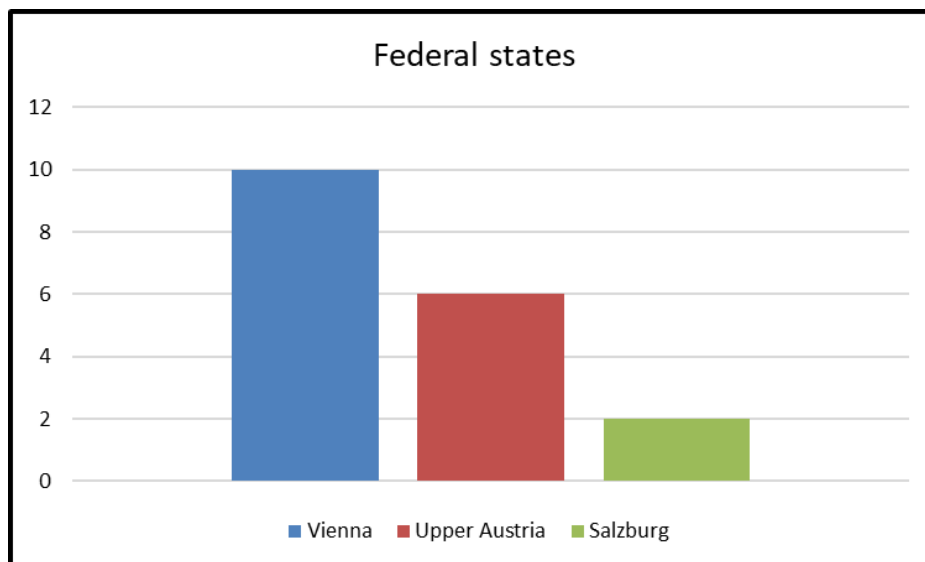


Fig. 1. Distribution of teachers in Austria

Although schools throughout Austria were conducted, they were mainly teachers from Vienna, followed by those from Upper Austria and Salzburg.

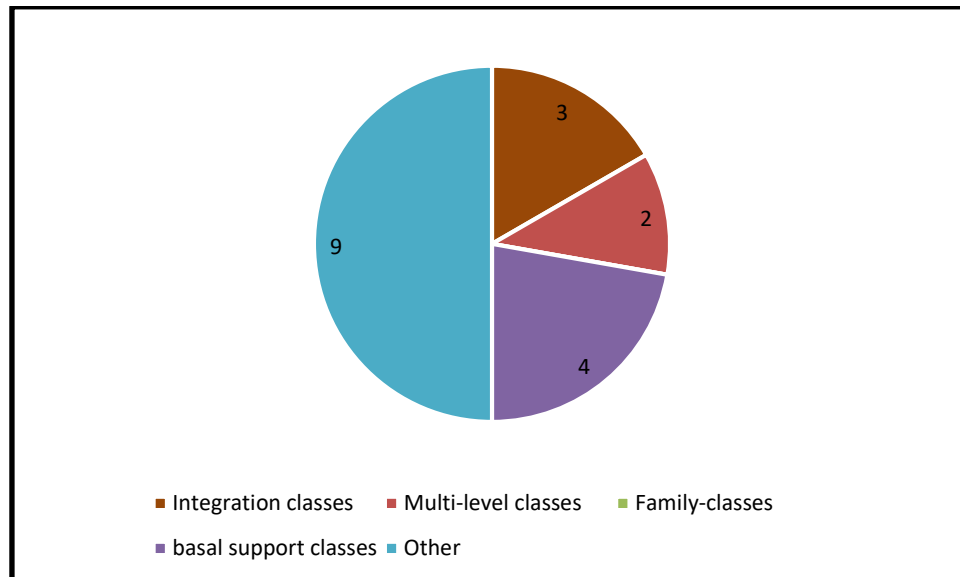


Fig. 2. Class settings

As shown in Fig. 2, the teachers were recruited from various settings. The three teachers were from the integrated classes. Integration classes indicate that disabled and non-disabled children attend school together. Two teachers are available for this in the classroom setting: a primary school teacher and a special-needs teacher [29]. Two teachers were from multilevel classes, in which two teachers taught children from grades to 1-4 in one class and four teachers from basal support classes. Basic support classes are a type of school for children and young people with multiple disabilities, who are dependent on care. Two teachers worked in teams with four to five pupils. The classes and groups were of mixed age [30]. Nine teachers were in different settings as well as in primary school classes. This results in high variation in cases, which is of particular importance for research design [31].

2.2 Guideline-Centered Interviews

One year later, expert interviews were conducted using similar questions (see Appendix A) to obtain more detailed information. Eight teachers agreed to participate in the study. The average length of the interviews was 30 minutes. The interviews were evaluated using qualitative content analysis, according to Kuckartz and Rädiker [32]. Therefore, the following steps were considered:

- Phase 1: Initiating text work, memos, case summaries
- Phase 2: Development of main categories
- Phase 3: Code data with main categories
- Phase 4: Form subcategories inductively
- Phase 5: Code data with main categories
- Phase 6: Simple and complex analysis
- Phase 7: Writing down the results and documenting the procedure.

2.3 Insights into the Data Analysis

In Phase 1, the interested, careful reading of the text and the marking of text passages that appear particularly important initiate content-structuring qualitative analysis. Remarks and annotations are written on the margins, and anything special that stands out when reading, as well as ideas for evaluation that arise spontaneously, are recorded in the form of memos. The conclusion of the first phase of dealing with a text is the writing of the first short-case summary [32]. Appendix B presents case summaries of the interviews.

In content-structuring qualitative content analysis, categories are used and subcategories create content-related structuring of the data. In Phase 2, the main categories were directly derived from the research questions because the associated topics were already leading when the data were collected.

Table 1. Main categories and their descriptions translated into English

Abbreviation	Main thematic category
RSS	role of language and literacy
HE	Attitude
LP	General information about the learning process
L	Reading
Sp	Language
Sch	Writing
H	Challenges

With the help of the main categories, Phase 3 follows in which the data are encoded. The first coding process is suitably designed in such a way that each text is sequential, that is, line by line, going from beginning to end, and assigning sections of text to categories. Therefore, it must be decided in each case where the category addressed in the passage in question is; this category is then assigned. Non-meaningful passages of text or text passages that are not relevant to the research question remain uncoded [32].

As a rule, in a content-structuring content analysis of the first coding process, the differentiation of the initially still relatively made general categories. This starts phase 4. The general process of differentiation and determination of subcategories looks like that of Kuckartz and Rädiker [32].

- The selection of a category to be differentiated, that is, for this category, is now forming (new) subcategories.
- Compiling all passages coded in this category into a list or table.
- Creation of material subcategories through inductive category formation: The subcategories were initially compiled as an unordered list.
- Organising and systematising the list(s), identifying the relevant dimensions, and possibly combining subcategories of the list into more abstract or general subcategories.
- Formulate definitions for the subcategories and illustrate the category definitions through quotations from the material.

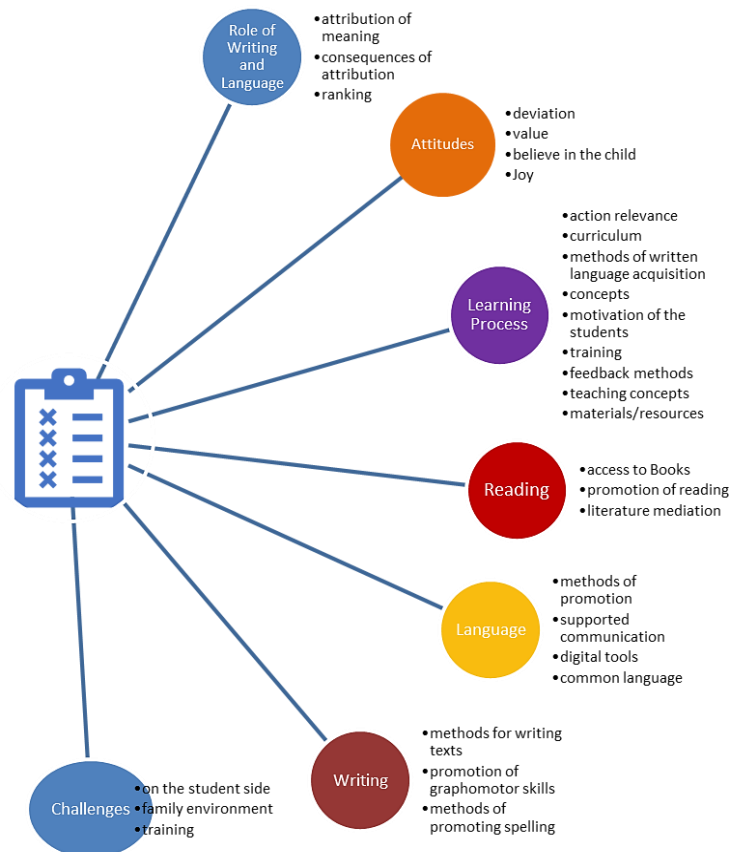


Fig. 3. Visualization of the main and subcategories

Table 2. Definition of subcategories for the main category “reading”

Subcategory	Short Definition	Examples
Access to Books	Description of how students get access to books	Library, class reading
Promotion of reading	Description of funding opportunities in the reading process	Reading books, reading in all subjects, reading training, Read aloud, Reading with persons outside the school, like so called reading grandmas and grandfathers
Literature mediation	Methods for communicating literature are mentioned.	free choice of book, picture book cinema, Tell, Book presentation, individual reading, class reading

With the formation of the subcategories, Phase 5 takes place, in which the differentiated categories correspond to the main category assigned to coded text passages. In Phase 6, case-related thematic summaries were made to carry out case comparisons of the research questions. At the end of the analysis, the results found and the results obtained are important findings that provide answers to the research questions examined in to write down a report [32]. This section discusses the knowledge gained from this study.

3. RESULTS

The results are presented with the help of the research questions. In the first step, the results of the descriptive analysis are presented and then

deepened through the results of the evaluation of the guided interviews.

3.1 Role of Language and Literacy in the Classroom

In connection with the first research question, which role language and literacy play in the classroom, nine teachers stated that it plays an important role. Of these, six pointed out the connection between language and literacy, while five teachers stated that a preference for language is important. Five teachers also referred to the context of the use of augmentative and alternative communication (AAC) and listed means of communication, such as the use of symbols, images, and photos.

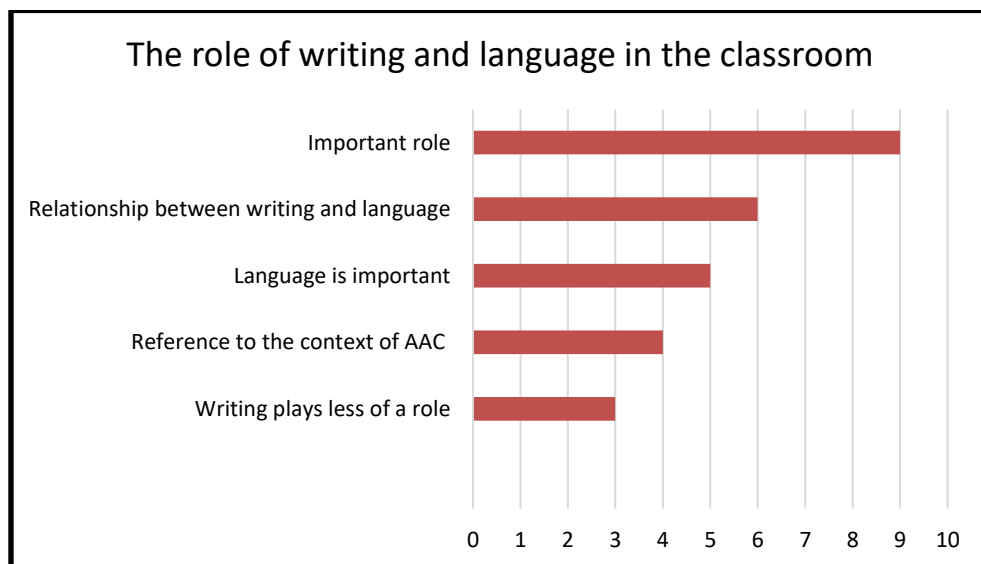


Fig. 4. The role of writing and language in the classroom

In the interviews, only Teachers 1 and 3 addressed language and literacy as being important. Here, as with Teacher 4, the importance of professional participation is emphasized. Teacher 2 highlighted the importance of literacy in enabling participation and a self-determined life. Without the acquisition of literacy competencies, Teacher 2 saw a dependency relationship that could not be reconciled with autonomy. Therefore, reading was first given to the teacher. In this context, reference can be made to the importance of occupational participation, which is also set out in the UN Convention on the Rights of Persons with Disabilities (Bundesministerium für Arbeit, Soziales und Konsumentenschutz [BMASK], 2012, 2015). From the teachers' perspective, the importance is associated with autonomy and a self-determined life, and therefore shows a high necessity in the implementation with the students and the associated possibilities to offer methods for this. Teachers 6, 7, and 8 listed language as essential because the lessons are mainly conveyed through linguistic means and are therefore important for following the lessons.

3.2 Implementation of Language Education in School

As part of the question of how language and literacy education is implemented in the classroom, a differentiation between them was given; therefore, the implementation of language education was first described. Two teachers stated that speaking in class played an important role in implementing this. Owing to the importance of language in everyday life, two other teachers differentiated the use of language as a means of communication in everyday life, which is supported by symbols and signs. One teacher stated that the use of different languages plays a role in the context of everyday language and is methodologically used in the classroom. Five teachers explicitly referred to AAC to enable language education. Two of these teachers guide you to carry out an actual status survey of the students and to open up individual possibilities according to the results, which, among other things, also with the help of supported communication.

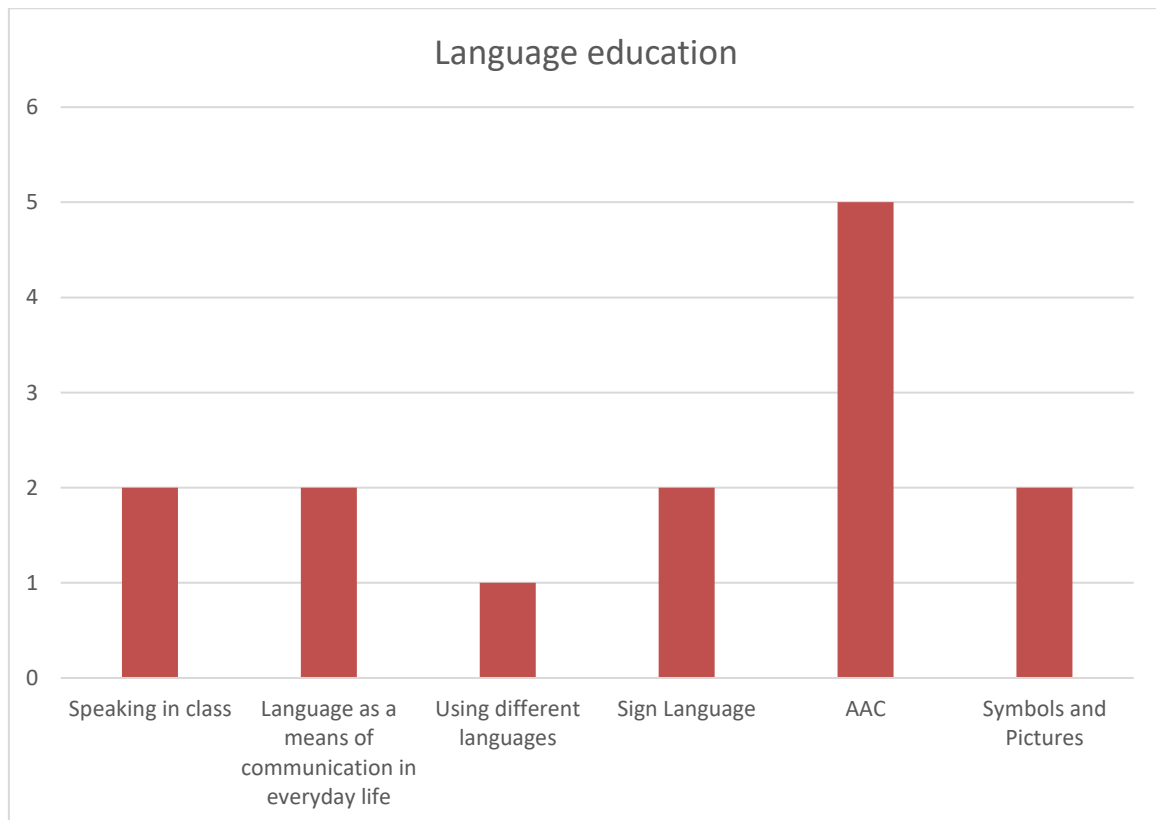


Fig. 5. Implementation of language education

In the context of the interviews, four teachers indicated that speaking was supported by opportunities to speak, such as weekend talk, morning circle rituals, and given picture stories. In this context, Teacher 2 lists the possibilities of individualisation; for example, having students bring a note with keywords or another child brings a recording that contains the weekend experience. The possibilities of supporting speaking opportunities with the help of AAC are listed by three teachers, with one teacher supporting the spoken part with writing, but not on the symbol level. Teaching person 4 explained that the AAC method consists of a mixture of symbolic language and sign-supported communication. Furthermore, reference is also made to technical tools, such as the Lector app, which is used for modelling the use of gestures for a more in-depth study. In the context of the use of AAC, Teacher 2 stated that this can very well replace a personal conversation, but symbols cannot replace the area of literacy and thus open up an associated field of tension.

Teacher 1 stated that students were asked to speak in full sentences when they talked about everyday things; otherwise, they would communicate in two-word sentences. Teacher 5 used English as an intermediate language to learn German because of its high motivational factor. References are also made to tools such as Google Translator, which students use to listen to a word in English and translate it into German. For Teacher 7, students' multilingualism plays a special role and states that this should be encouraged more in the classroom, but that the materials are mainly produced in German. Teachers 1 and 3 lead through the implementation of role plays to re-enact corresponding everyday situations in language. Teachers 5 and 8 methodically present specific speaking exercises, which are characterized by speaking before and after.

Different methods and approaches can be described based on different settings. For example, the following methods are addressed in the context of acquiring speaking skills in German. Role-playing games, frequent opportunities, speaking prompts to promote the German language, the focus on speaking whole sentences, and repetition are mentioned in this context. The positive influence of role-playing games in the context of language acquisition has already been proven in a number of studies and shows potential for language education, especially for the acquisition of foreign and

second languages across the lifespan (for example, Ladousse [33] Van Ments [34] and Utami et al. [35] Tari & Safitri [36]).

Enabling speaking occasions, demanding full sentences, and incorporating repetition into language education have been shown to be effective strategies for language acquisition [35,37]. Sentence repetition tasks are valuable tools for language assessment because they draw upon a wide range of language processing skills and provide possibilities to reflect an underlying language ability factor rather than a separate construct [38]. These strategies not only facilitate intercomprehension and communication in language classrooms but also aid in the development of language skills over time. This demonstrates their effectiveness in enhancing their language acquisition.

Another method of learning German as a second language is to use another language as the medium. In the interviews, the references were provided in English. Furthermore, the use of first languages is also seen as a method whereby it is critically stated that there are few materials in different languages in Austria. The use of technical tools, such as translation, is also discussed in this context.

The use of another language or the first language can significantly impact the acquisition of a second language. Research has shown that the first language can play a crucial role in learning a second language [39,40]. Factors such as the similarity between first and second languages, classroom settings, and exposure levels to both languages can influence the effectiveness of language transfer [41]. The use of technical tools such as Google Translator for language acquisition has shown varying degrees of effectiveness. Some research indicates that learners utilise tools such as Google Translator to search for vocabulary during interactions, with the aim of constructing knowledge [42]. Other research has shown that digital tools have been widely used to enhance vocabulary acquisition, leading to improvements in language skills in reading, writing, speaking, and listening [43].

Language acquisition can be supported by using symbols and fonts, because symbol-infused joint engagement plays a crucial role in language development – especially in “typically” developed toddlers, where symbols are used to increase interactions and the contribution of language

acquisition [44]. Symbol communication aids, such as graphic symbols, are also essential for children with severe communicative impairments because they can be used in expressive communication and vocabulary organisation [45,46]. Research shows that the ability to link symbols to referents is important for language acquisition, especially for children with cognitive disabilities, and emphasises the importance of selecting the appropriate symbols based on visual complexity and iconicity [47].

3.3 Implementation of Literacy Acquisition

Regarding the methods of acquiring literacy, three teachers from the interviews and two teachers from the survey cited the analytical-synthetic method, which also includes the language experience approach of Wilhelm and Walter [15]. For teachers, this method is also known as the "Marlene Walter method" regarding the person. However, in their differentiation, there are differences in their implementations. For example, Teacher 2 points out that the method goes from whole-word formation to letters and phonetic gestures. This is discussed in connection with the students with trisomy 21. In addition to the mentioned working out of words, letters, and gestures, the reading process of the whole word is running. Here, words that were in the interest of the children or were relevant were selected. This approach is similar to Patricia Oelwein's [9,10] concept of early reading. The so-called "Marlene Walter method" is used when extracting words. The holistic words were processed according to a special sequence. Pictures, pictograms, etc., are used for the graphic visualisation of the words. Furthermore, preliminary skills in written language acquisition play a special role for Teacher 2. For example, scribbling in a notebook is seen as an important part of the learning process in which students can leave traces (compare Lin [18]). Teacher 5 learns how to present the method by working on initial sounds and letters and learning the grapheme-phoneme correspondence of words. The words were memorised using the pictures. In teacher 6, learning words and letters are first learned step-by-step and the focus is immediately placed on writing texts.

Teacher 3 cited the so-called cybernetic method. The mouth pictures are assumed here. This implies that the sounds were learned through these visemes. Thus, visemes represent

intermediate steps between spoken and written language. In parallel, letters are developed over time. From the experience of the teacher, the visemes support the acquisition of written language, and it is also easier for students to sound them together. Texts with letters are only read at a later point. Reading with visemes takes place earlier in the first grade than in writing all letters.

Teacher 4 described their own pedagogical concept using a trinity that results from handwriting, sign language, and the use of symbolic language. Due to the heterogeneity of students, this concept allows focusing on specific areas that lead to expression. In this context, reference is made to the time after school and the opportunities there to communicate with the help of electronic means of communication.

Teacher 8 presented a method of acquiring literacy by first working through four letters by reading. After eight letters are introduced in this manner, the first letters are written. This means that with this method, the reading-learning process ends earlier than the writing process. The choice of method was based on the motivation to learn to read. When learning to write, the initial focus is on holding the pen, dividing the paper, and graphomotoric skills.

In the implementation of literacy, different methods, such as the analytical-synthetic method and synthetic method, are available to the participants. In this context it can be stated that the effectiveness of different methods in written language acquisition varies. Aristotle already preferred the analytical-synthetic method to the analytical method because, in his view, it takes more account of the student's prerequisites and is based on scientific knowledge [48]. Understanding cross-linguistic developmental processes is crucial for optimizing teaching strategies in literacy acquisition, taking into account factors such as phonological complexity and the spelling consistency of languages [49]. Each method offers unique advantages and, therefore, needs to be adapted to student development. However, it can be seen from the data that the choice of method is mainly influenced by the teachers' experiences and their preferences for certain methods, and that they therefore also use "specially" developed methods that do not explicitly refer to existing models for their own classroom setting. Their own experiences play a key role in legitimising the use of this method.

3.4 Challenges in Language and Literacy Education

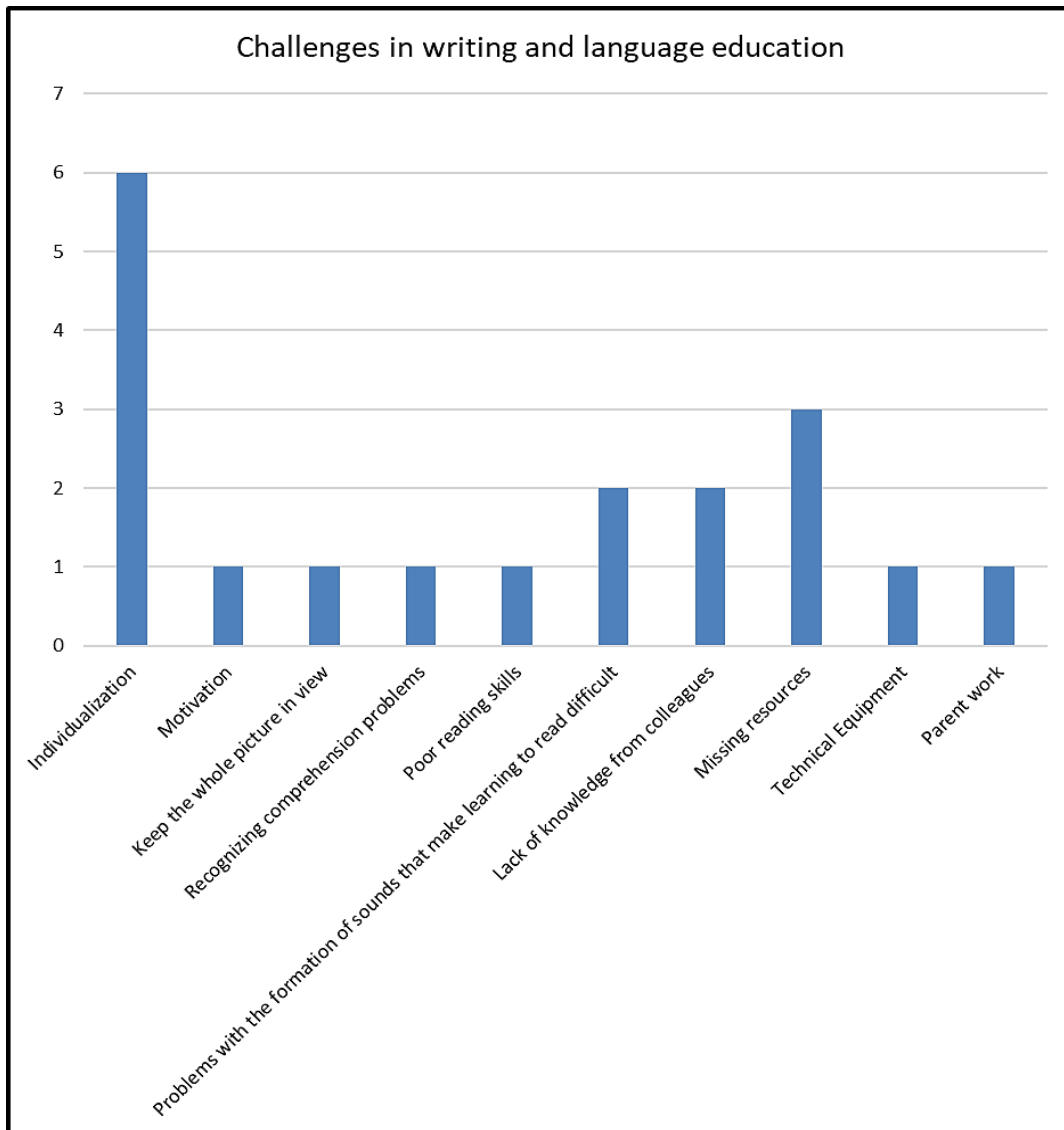


Fig. 6. Challenges in language and literacy education

Six of the 18 teachers referred to the individualization of the students when it came to challenges. Individualization was also discussed as a challenge in the interviews. Here, for example, teacher 2 opens up that with some students, one takes the place, and nothing goes further. According to Teacher 2, despite all efforts, the basic reading process cannot be completed. Teacher 4 revealed that the students would benefit from 1-on-1 supervision, and that this is seen as a challenge. In this context, reference can also be made to the lack of resources provided by three teachers who participated in the questionnaire. In the

interviews, the behaviour of the students was cited as a further challenge. The use of social media and associated communication, led by two teachers, is seen as a challenge in the language and literacy process. In this context, Teacher 5 also returns to learning the English alphabet and pronunciation, which is used in class as a transitional language for German. Teacher 3 also stated that over the years, the impression has arisen that the students' attention is waning. In this context, Teacher 5 cited the area of tension that results from behaviour and pleasurable learning in order to positively occupy the acquisition process.

Two teachers from the survey each stated that the challenges lie in the lack of knowledge among colleagues and difficulties in the formation of sounds that influence the reading process. In the context of a lack of knowledge, three teachers from the interview study referred to challenges in the training. For example, significant findings were made only by Teacher 2 after his studies in the context of dealing with students with trisomy 21. Teacher 3 also verbalizes dissatisfaction with the training, which can only be achieved by attending appropriate further training courses. Teacher 4, who is still studying herself, stated that AAC should be a topic for all students.

Another challenge mentioned in the interviews was the family environment of the teachers. The importance of reading aloud, the regulation of leisure-time behaviour when playing video games, and interpersonal communication is considered essential. It is therefore important for Teacher 6 that the children master their first language and that the families are also convinced of this to communicate in the family language(s). Teacher 4 refers to the purchase of electronic means of communication, which not all parents understand and therefore must be persuaded.

In research, teachers have encountered various challenges when teaching language at school. These challenges include issues related to multilingualism, heritage language maintenance, misconceptions about language learning strategies, deficiencies in professional training, the classroom environment, and the impact of students and parents on teaching performance. Teachers also face difficulties in student engagement, effective instruction for all learners, personalising teaching, and managing instruction, especially in tasks like teaching speaking, motivating learners, teaching writing, and listening [50,51,52].

In the context of literacy education, the challenges include teaching technique-related, time-related, linguistic-related, and learning motivation-related obstacles [53,54]. Additionally, it can be stated that teachers who teach second languages face difficulties in developing students' linguistic competence in writing, which is a complex task [55]. Furthermore, assessing writing skills poses significant challenges such as students' language problems, confusion between focusing on content or form, time constraints, overloaded classes, and insufficient time for

assessment [56]. Overcoming these challenges requires professional development programs, enhanced teacher training in assessment, and encouraging students to engage in intensive practice. Furthermore, it requires support from speech-language therapists and collaborative efforts among teachers, parents, school administrators, and communities [57].

4. DISCUSSION AND CONCLUSIONS

With regard to the number of participants, it must be recognized in this section that the small number of respondents may not reflect the opinion of the majority of teachers in Austria. The generalization of the results should therefore be interpreted with caution. This exploratory study has provided valuable insights, and it would be interesting to further investigate these initial findings in a larger, more representative study in the future.

The text presents a comprehensive discussion of the intertwined nature of language and literacy [1] highlighting their significance in the development of children, particularly in educational contexts. In conclusion, the following aspects can be summarised:

Language and Literacy as Human Rights: The acquisition of language and literacy is crucial for social participation and leads to a self-determined life. Recognising this, language and literacy have been declared human rights, emphasising their importance in ensuring inclusive and equitable quality education [4,5].

Importance in Education: Goal 4, from social sustainability goals, emphasises the importance of language and literacy in education and lifelong learning [6]. Teachers play a pivotal role in implementing language and literacy education in their classrooms; however, they often lack explicit knowledge in these areas [56,57].

Research focused on language and literacy in Austrian schools The research paper discussed focuses on the interplay between language, communication, written language acquisition, and teaching methodologies in Austrian primary schools. Through qualitative research methods, such as online questionnaires and interviews, this study aims to understand teachers' perspectives on language and literacy education [58].

Implementation of Language and Literacy Education: Teachers employ various methods and approaches to teach language and literacy

skills effectively, such as shared book reading, role-playing games, and using digital tools like Google Translator. The choice of method often depends on teachers' experiences and preferences.

Challenges in Language and Literacy Education: Teachers face numerous challenges in teaching language and literacy, including issues related to multilingualism, deficiencies in professional training, the classroom environment, student engagement, and parental involvement. Challenges specific to literacy education include teaching techniques, linguistic barriers, and learning motivation.

Addressing Challenges and Moving Forward: Overcoming these challenges requires continuous professional development, enhanced teacher training, support from speech-language therapists, and collaborative efforts among teachers, parents, school administration, and communities. Additionally, understanding cross-linguistic developmental processes and adapting teaching strategies for student development can enhance language and literacy education outcomes.

In summary, the text underscores the importance of language and literacy in education while also highlighting the challenges teachers face in teaching these skills. By addressing these challenges and implementing effective teaching strategies, educators can better support students in their language and literacy acquisition journeys, ultimately contributing to their overall academic success and social inclusion.

DISCLAIMER (ARTIFICIAL INTELLIGENCE)

The author(s) hereby declare that generative AI technologies, specifically OpenAI's GPT-4 and Paperpal have been used during the writing or editing of this manuscript.

- **AI Tool Name:** GPT-4 (ChatGPT)
- **Version:** GPT-4, released by OpenAI
- **Model:** GPT-4 architecture
- **Source:** OpenAI (<https://openai.com/>)

Input Prompts Provided to Generative AI Technology:

[List here the prompts you provided to the AI for any part of the writing or editing process. For example:]

1. "Can you provide a brief explanation of how to declare the use of generative AI tools in a manuscript?"
2. "Please summarize the key concepts of the research paper."
3. "Help rewrite this paragraph to enhance clarity while maintaining the original meaning."

The generative AI tool was used to assist in generating content based on the above prompts, but the author(s) reviewed, edited, and verified the accuracy of the content to ensure it aligns with the scholarly and ethical standards of the manuscript.

- **AI Tool Name:** Paperpal
- **Version:** 2.1.4.3
- **Source:** <https://paperpal.com/>

Paperpal was used for language improvements.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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APPENDIX A

(Written) language education in Austria

Dear participant,

welcome, and thank you for your interest in our study.

Language and writing are essential for creating communication opportunities and leading a self-determined life. In this questionnaire, we are interested in the role of language and writing in the classroom. We therefore ask very open questions that should be answered as comprehensively as possible.

The questionnaire takes about 15 minutes to complete. The data is collected anonymously and only evaluated for scientific research purposes. Furthermore, your data will be treated confidentially.

We would be very happy if you could take the time to do this!

Many many thanks!

Survey questions:

1. Enter the first letter of your first and last name! (Example: Miriam Sample: MM)
2. How many years of service are you in?
3. In which class do you teach?
4. Where is your school located (country, city, district)?
5. What role do writing and language play in your lessons in the school entry phase?
6. How do you implement (written) language education in your lessons?
7. What methods and materials do you use and how are they used in the classroom?
8. What possible challenges do you see in this?

Questions 5 to 8 were like the questions for the interview guide.

APPENDIX B

Case summaries

Table 3. Case summaries from case 1 to 4

Case 1	Case 2	Case 3	Case 4
Years of service: 34	Years of service: 25	Years of Service: 30-35	Years of service: 5
School location: city	School location: city	School location: city	School location: city
School:	School: School center for students with special needs	School: elementary school	School: School Center for Inclusion and Special Education
<ul style="list-style-type: none"> • elementary school classes • General special school classes • Classes for pupils with special needs • intensive classes 	<ul style="list-style-type: none"> - integration classes - SEF classes 		
Main focus: „disabled children“			
Training		Sign language proficient	
8 years special school and children with very special needs			
Current class: Special school class	Current class: Special education	Current class: Class teacher (2 nd class)	Current class: Class teacher in a small class

Case 1	Case 2	Case 3	Case 4
(multi-level class, 8-10 children/class due to the impairment)	teacher in an inclusion class (1 st grade)	13 students Particularities: School for the deaf with integration of hearing students (reverse integration) 5 students with SPF due to a speech disorder (developmental delays and therefore no "right" language yet)	(last grade before transition to a day structure/workshop)
Students	Students		
<ul style="list-style-type: none"> - Everyone can read and write. - 2 children, whose first language is German - Other first languages (e.g. Turkish, Croatian, Macedonia) 	<ul style="list-style-type: none"> - children with Down syndrome - Can all communicate 		
Human resources:	Human resources:		Human resources:
<ul style="list-style-type: none"> - Two teachers in the class - So called reading grandmother /- father 	<ul style="list-style-type: none"> - Second colleague (primary school teacher) 		<ul style="list-style-type: none"> - Works with a team partner (participates 70% in class) - after-school teacher
role of writing and language	role of writing and language	role of writing and language	role of writing and language
<ul style="list-style-type: none"> - Very significant 	<ul style="list-style-type: none"> - Very important - Reading important for a self-determined life and participation 	<ul style="list-style-type: none"> - Plays a major role - Own preference as "favourite subject" - Student motivation high 	<ul style="list-style-type: none"> - Main focus on language in view of the transition - self-determination
Methods for writing language acquisition	Methods for writing language acquisition	Methods for writing language acquisition	Methods for writing language acquisition
<ul style="list-style-type: none"> - Strategies for the writing process - Speak in full sentences - legible writing - Integration in all objects - Reading books and literature → Inclusion of the library - Writing a wide variety of text types in all subjects → Textbook as a basis 	<ul style="list-style-type: none"> - Getting in touch with writing - Creating situations in which writing and written language are relevant to everyday life. - Pleasure learning - Change from ÖGS to the logopaedic sound - gestures - Symbol and 	<ul style="list-style-type: none"> - Graphomotor writing process: "Writing neatly" - Copy - KUL method - clauses with symbols - Exploring spelling peculiarities (8 categories) - Textbooks Trauner Verlag - cybernetic method - Exit: visemes (lute) - Parallel: 	<ul style="list-style-type: none"> - Doing tasks in writing → relating to everyday life - handwriting/typing - electronic communication tools - Pedagogical concept of the "trinity" (sign-supported communication, handwriting, use of symbolic language (Metacom)) → with reference to everyday life - App for modeling the guK (Lactory)

Case 1	Case 2	Case 3	Case 4
	Word (Metacom Symbols) - Walter Marlene method	development of the letters - weekly schedules - role playing - Reading and presenting books - roundtables - picture stories - Reading training (daily 5 minutes)	
challenges - impairment - Social Media (Whatsapp)	challenges - take its place - The tension between AAC and writing → Literacy concept launched - Training	challenges - attention of the students - computer games - family environment - Read aloud - Linguistic example - Shared communication - temporal resources - role in relation to after-school care	challenges - 1:1 supervision of the students - Digitization offensive → hardware, but no licenses for the required software - parent work - Training

Table 4. Case summaries from case 5 to 8

Case 5	Case 6	Case 7	Case 8
Years of service: 3 School location: city	Years of service: 40 School location: city	Years of service: 6 School location: city	Years of service: 26 School location: City (outskirts)
School: school campus, autistic entry classes , SEF classes, VS classes, integration classes		School: Inclusive school Special education teacher and team teacher in 2 classes (both 1st secondary school, 11 students, normally 15 students)	
Education: IP in MA studies, secondary school			
Current class: Intensive teacher in a SEF class (multi-level class), integration class (multi-services) Full-time with class teacher	Current class: Class with 5 children (multi-level class) 2 children fourth, otherwise one first, one second and one third class	Current class: ASO and SEF curricula Particularities:	Current class: Class leading teacher in a second class and preventive support, mentor Particularities:
Human resources: - class teacher	Human resources: - Always two in class	Human resources: 2x to 3x occupied	
Students - Age: 10-17 years - Focus on autism (diagnosis: early childhood autism) - Other first	Students - All 5 children have ASD diagnosis and some also have	Students - 99% DaZ + socio-economically weak families - Can all write by hand	Students 1/3 of the students have a different first language, students who are taught according to the ASO curriculum, AO students

Case 5	Case 6	Case 7	Case 8
languages - English better than German	ADHD - All able to speak the language - VS curriculum - S curriculum - All have a different first language (Greek, Serbian, Albanian, 1 child German as first language)		
role of writing and language	role of writing and language - Differing - Language is essential to be able to communicate with each other	role of writing and language - Language is the main medium of instruction → therefore great role	role of writing and language - language plays a major role ○ MIKA-D testing - I also value writing and reading
Methods for writing language acquisition - Voice Accompaniment by UK (Metacom) - Each child has a Metacom folder - Accompaniment of the language by guK - Mixture of analytical and synthetic methods (initial sounds, phoneme-grapheme correspondence, words) - audition and - pamphlet - computer use - Google Translator (English → German) - Montessori material - Graphomotor exercises - "Big Mac" who can talk. - Graphomotor exercises	Methods for writing language acquisition - Use of images for plans to provide orientation and structure - Storytelling doesn't quite work - Forming sentences works verbally and in writing - Forming sentences , writing on the computer, practicing learning words, offering writing prompts - Writing down experiences together - Analytical-synthetic method - Learn the	Methods for writing language acquisition - Not all are literate - Written language acquisition and pictures and pictograms confrontation with writing - script - pamphlet - Laptop classes (Anton class, ten-finger system) - use of the library	Methods for writing language acquisition - speaking exercises - Individual reading time - reading homework - 4 letters are worked on reading and after 8 letters can be read, then the first letters come to writing - Graphomotor → pen hold - fonts - Montessori (sentence star, parts of speech, word symbols)

Case 5	Case 6	Case 7	Case 8
- Occasional writing	- print first Expressing one's own needs in an appropriate form		
challenges	challenges	challenges	challenges
- Learning the English alphabet through television	- Family environment (reading together, reading aloud, support, speaking first	- Access to Books	- Different needs of the children
- Motor impairment of the students → all can write with pens	language at home)		- Family environment (promotion)
- Tension UK → Metacom everywhere	- all-day care		- class size
	- Gender difference in motivation to read (boys)		

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