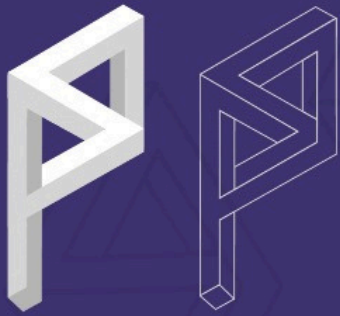




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The effect of cartoon-adapted reading texts on the reading fluency of a student with autism spectrum disorder and learning disability¹

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ABSTRACT

Students with co-occurring autism spectrum disorder and dyslexia may experience reading-fluency difficulties associated with their individual diagnostic and reading profiles. Although interest-based materials may support students' attention and engagement in the reading process, their potential contribution should be evaluated in combination with structured reading instruction. This study examined changes in the reading accuracy, reading errors, and oral reading time of a 12-year-old sixth-grade student with co-occurring diagnoses of autism spectrum disorder and dyslexia. The study was conducted using an ABAB model, one of the single-subject experimental designs. Non-adapted reading texts were used during the A1 and A2 phases, whereas texts adapted using the student's preferred cartoon characters were implemented during the B1 and B2 phases. Guided and repeated reading were used throughout all phases. Data were collected during each session by recording the student's reading time and reading errors using Akyol's (2010) Error Analysis Inventory and were evaluated through graphical analysis. Across the ABAB process, the number of words read correctly increased, while reading errors and oral reading time decreased. The student's reading performance progressed from the frustration level at baseline to the independent reading level by the end of the study. However, the gains were maintained during the A2 phase, when the adapted texts were withdrawn, and the student's performance did not return toward baseline. Therefore, the observed improvements cannot be attributed exclusively to the cartoon-adapted texts. The findings provide preliminary, participant-specific evidence that interest-based text adaptation, when combined with guided and repeated reading, may support the reading development of a student with co-occurring autism spectrum disorder and dyslexia. Future research should employ designs that demonstrate stronger experimental control, include participants with diverse profiles, and incorporate follow-up assessments.

KEYWORDS: Autism spectrum disorder; Dyslexia; Reading fluency; Interest-based texts; Single-subject research

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¹ A preliminary version of this study was presented as an oral presentation at the International Symposium on Research in Inclusive Education (ISRIS) held online on May 30–31, 2025.

1. Introduction

Reading is a complex meaning-making process that requires the combined use of visual perception, cognitive processing, comprehension, establishing connections, critical evaluation, and mental construction of meaning (Güneş, 2007). As one of the primary means of accessing information, generating new knowledge, and applying acquired knowledge across different fields, reading plays a central role in the learning process (Kardaş & Tunagür, 2020). Reading skills acquired during the early years of schooling can influence an individual's academic, social, and personal development throughout different stages of life. Individuals with well-developed reading skills are better positioned to benefit from educational experiences and participate actively in social life. In this respect, acquiring effective reading skills is considered one of the fundamental steps toward achieving academic, social, and personal success (Yıldız, 2013).

In today's rapidly developing and constantly changing world shaped by the information age, reading is one of the primary means through which individuals access new knowledge and follow current developments. Reading is a meaning-making process conducted with a specific purpose and method that involves the use of prior knowledge and interaction between the author and the reader (Akyol, 2011). However, sustained engagement in reading depends not only on reading ability but also on the individual's experience of and enjoyment derived from the reading process. The development of a reading habit is closely associated with the pleasure derived from the texts being read (Aytan, 2015). Individuals who enjoy reading are more likely to sustain their engagement in reading, establish stronger connections with texts, and use what they read to make sense of their life experiences (Sirem, 2020).

For reading to be effective and reach the desired level, there must be coherence between the message the writer intends to convey and the meaning constructed by the reader. Misreading or incomplete reading can disrupt this coherence and lead to a loss of the intended meaning. Persistent difficulties in accurate or fluent word recognition, decoding, and spelling are characteristic of dyslexia, which is classified as a specific learning disorder with impairment in reading (American Psychiatric Association, 2022). These difficulties may be reflected in letter, syllable, or word omissions; substitutions; reversals; repetitions; and slow or effortful reading, all of which can adversely affect reading fluency (Altun et al., 2011).

Autism spectrum disorder and dyslexia are distinct neurodevelopmental conditions that may co-occur. Reading performance among students with ASD is heterogeneous: some students demonstrate age-appropriate or advanced word-reading skills, whereas others experience difficulties in word recognition, phonological decoding, fluency, and/or comprehension (Brimo et al., 2021; Vale et al., 2022). Therefore, reading difficulties in a student with ASD should not automatically be attributed to autism; instead, both the student's diagnosed condition and observed reading profile should guide interpretation. Recent evidence further indicates that decoding and fluency make distinct contributions to reading performance in children with ASD, underscoring the importance of clearly identifying the specific reading component targeted by an intervention (Peristeri et al., 2024).

The participant in the present study had co-occurring diagnoses of ASD and dyslexia. ASD constituted the primary context of his educational placement because he attended a special education classroom for students with mild autism, whereas the slow oral reading, word-level inaccuracies, and decoding errors targeted by the intervention were interpreted primarily in relation to his diagnosed dyslexia. ASD was relevant to the design of the intervention because the student's individual interests and motivation informed the use of familiar cartoon characters in the reading texts. Accordingly, the

study does not characterize either diagnosis as globally dominant; rather, it differentiates their functional relevance to the outcomes measured in the study. Because written expression was not assessed, no conclusion was drawn regarding the source or nature of any writing difficulties.

The inability to read fluently slows down reading speed and can adversely affect reading comprehension. According to Aşıkcan (2019), fluent reading of a text contributes to making reading an automatic process; once this automatization is achieved, the individual can devote less time to decoding words and focus more on understanding the text. In this context, reading fluency is understood to be directly related to reading comprehension. Fluent reading enables the reader to comprehend the text as a whole, rather than in fragmented parts, by ensuring a certain reading speed (Ülper, 2010). A study conducted by Powell (2008) involving 2,437 third-grade primary school students found that students with high reading fluency also demonstrated strong comprehension skills.

There are many techniques in literature aimed at improving reading fluency. The most commonly used techniques include repeated reading, guided reading, echo reading, readers' theater, choral reading, word repetition, immediate feedback, interest-based reading, and using poetry. In this study, repeated reading technique will be used.

According to Yılmaz (2006), repeated reading is "the practice of reading texts several times until they are read fluently." In this technique, students with reading difficulties work under the guidance of an adult by reading texts repeatedly, arranged according to difficulty level. Frey and Fisher (2018) emphasize that during repeated reading, short texts of 50 to 200 words should be read silently or aloud multiple times until the student reaches a sufficient level of speed and accuracy. Johnson (2017) notes that the main focus of the repeated reading method is on correctly reading as many words as possible rather than on comprehension. He also recommends timing the readings and recording the number of correctly read words during each session.

The effects of repeated reading on reading accuracy, reading rate, and fluency have been examined in various studies involving students with and without reading difficulties. Bryant et al. (2000) conducted a four-month study with 60 middle school students, including 14 students with reading difficulties, 17 students with strong reading performance, and 29 students with moderate reading performance. At the end of a combined instructional program incorporating repeated reading, collaborative strategic reading, and word-recognition techniques, most students demonstrated improvements in oral reading fluency and reading accuracy. However, some students with particularly low initial reading levels showed limited progress, indicating that students may respond differently to the same intervention.

Studies conducted in Türkiye have also examined the effects of repeated reading on students experiencing reading difficulties. Yılmaz (2006) implemented a total of 48 hours of repeated reading instruction, delivered for four hours per week, with four third-grade students experiencing reading difficulties and found that their reading levels progressed from the second-grade frustration level to the third-grade instructional level. Kaman (2012) assigned students from two socioeconomically comparable third-grade classrooms to an experimental group and a control group and implemented repeated reading with the experimental group using 10 texts over a 10-week period. At the end of the intervention, students in the experimental group demonstrated significant improvements in reading level and reading comprehension compared with the control group. Similarly, Erbasan and Erbasan (2022) implemented 20 hours of repeated reading and word-repetition instruction with a second-grade student experiencing reading difficulties and reported that the student's reading level improved from the frustration level to the instructional level.

Research focusing on reading instruction for students with ASD and co-occurring learning or other neurodevelopmental difficulties remains more limited. Coulter and Sasnett (2016) conducted a case study with a child who had ASD and co-occurring neurodevelopmental characteristics, including attention-deficit/hyperactivity disorder and a specific learning disability, and reported that a comprehensive, multicomponent intervention tailored to the student's individual learning profile produced marked improvements in reading achievement. In their systematic review of 19 reading-instruction studies involving children with ASD, Bailey and Arciuli (2020) identified reported gains in phonics, reading accuracy, reading fluency, and reading comprehension; however, only a small proportion of the reviewed studies were judged to have adequate or strong methodological quality. Focusing specifically on repeated reading, Simons et al. (2022) combined repeated reading with performance-contingent rewards and error correction in an intervention involving three young children with ASD and found that this intervention package could support the development of reading fluency. Collectively, these studies highlight the importance of tailoring reading interventions to the individual learning profiles of students with ASD and co-occurring learning difficulties.

Taken together, these studies suggest that repeated reading may support reading accuracy and fluency among students with reading difficulties and students with ASD, although responsiveness to the intervention may vary according to individual characteristics. In the present study, repeated reading was combined with texts adapted using the participant's preferred cartoon characters. Thus, the fluency component of the intervention targeted the word-level reading inaccuracies and slow oral reading associated with dyslexia, whereas the inclusion of cartoon characters was treated as an individualized adaptation intended to support the student's attention, motivation, and engagement in the reading process. Given that the development of reading habits is associated with enjoyment and positive experiences during reading, adapting texts to students' interests may support their participation in reading activities (Aytan, 2015; Sirem, 2020).

Recent research has increasingly focused on the use of technology-supported and interest-based reading materials to address the individualized literacy needs of students with ASD. Incorporating familiar characters, narratives, and personally meaningful interests into instructional materials may increase students' attention, motivation, and engagement during reading activities (Aspiranti et al., 2020; Mandak et al., 2019; Reutebuch et al., 2015; Valencia et al., 2019). However, recent single-case studies have shown that the effects of embedding the restricted or preferred interests of students with ASD in reading texts on reading comprehension and vocabulary outcomes may vary according to student characteristics and the instructional context (Marshall & Myers, 2021; Solis et al., 2022). These findings suggest that interest-based adaptations may support engagement and learning for some students but may not produce the same level of benefit for every learner. Accordingly, the inclusion of the participant's preferred cartoon characters in the reading texts used in the present study was considered an individualized adaptation intended to support his attention and engagement in the reading process rather than a stand-alone method replacing evidence-based reading instruction.

The aim of this study is to examine the effect of reading texts created with cartoon characters on reading fluency. In this regard, the main research question is: How do reading texts created with cartoon characters affect a student's reading fluency?

Sub-questions include:

1. What is the effect of reading texts created with cartoon characters on the student's reading time?

2. What is the effect of reading texts created with cartoon characters on the student's reading errors?

This study is expected to contribute to supporting the reading fluency of students experiencing reading difficulties and to offer an applicable perspective for teachers and families working with these students. For teachers, the study provides a concrete example of identifying a student's interests, adapting reading texts according to those interests, using the adapted texts in combination with guided and repeated reading, and monitoring the student's progress through reading time and reading errors. This approach may help teachers differentiate reading instruction according to students' diagnostic characteristics, individual needs, and sources of motivation rather than using the same materials for all learners. For families, the approach may provide guidance for preparing short, structured, and supportive home-reading activities based on the child's preferred cartoon characters, stories, or other interests. In this way, reading instruction provided at school may be supported consistently at home, while the child may experience reading as a positive and engaging activity rather than as a task that creates pressure. Nevertheless, because the study was conducted with a single participant, this practice should be regarded as an individualized instructional example that needs to be adapted to each student's characteristics rather than as a standardized method suitable for all learners.

2. Method

This study used a single-subject experimental research approach to examine changes in the reading fluency of a student with co-occurring diagnoses of autism spectrum disorder and dyslexia. The student's reading performance was monitored across four experimental phases based on the number of words read correctly, oral reading time, and reading errors. Non-adapted texts and texts adapted using the student's preferred cartoon characters were implemented alternately, while guided and repeated reading procedures were applied consistently throughout all phases. This approach enabled the student's performance under different text conditions to be compared through repeated measurements.

2.1. Design

The study was conducted using an ABAB reversal design, one of the single-subject experimental designs. The dependent variables were the number of words read correctly, oral reading time, and reading errors, whereas the independent variable was the type of reading text used. Non-adapted texts were used during the A phases, while texts adapted using characters and dialogues from "Rafadan Tayfa," a cartoon that the student frequently watched and enjoyed, were used during the B phases. Single-subject research designs are frequently preferred in special education research, particularly when it is difficult to form a sample group or when individual differences make it challenging to measure the effect of an intervention consistently across multiple students (Büyükoztürk et al., 2013; Johnson & Christensen, 2014). The ABAB design enabled the student's reading performance to be monitored repeatedly across phases involving non-adapted and adapted texts.

To determine the topics of the texts, the participant was informed that reading materials would be prepared specifically for him. Questions such as "Hayri will be in the text. What should Hayri do today?" (Hayri: The main character) were asked, and texts were created based on the participant's responses. In order to create the texts efficiently, the researchers prepared a prompt and submitted it to ChatGPT. The AI-generated texts, produced according to the specified word count, topic, and content, were reviewed by the researchers and pedagogically edited where necessary. Additionally,

an image of a scene from the cartoon was added at the beginning of each text. The implementation phase of the study was planned to last for two hours per week over a total of ten weeks.

Figure 1 Sample reading texts



A1: The baseline phase in which data were collected using non-adapted texts.

B1: The intervention phase in which texts featuring cartoon characters were used.

A2: The withdrawal phase in which non-adapted texts were reintroduced.

B2: The reintroduction phase in which texts featuring cartoon characters were used again.

The guided reading technique was used in all phases. First, the texts were read aloud to the student. Then, the practitioner and the student read the texts together. Finally, the student was instructed to read the texts independently, during which his reading time and reading errors were recorded.

2.2. Participants and procedure

The participant, Deniz (a pseudonym), was a 12-year-old sixth-grade student with co-occurring diagnoses of autism spectrum disorder and dyslexia. Deniz attended a special education classroom for students with mild autism at the same school where one of the researchers worked. Therefore, ASD constituted the primary context of his educational placement, whereas the word-level reading inaccuracies, decoding errors, and slow oral reading performance targeted in this study were interpreted in relation to his diagnosed dyslexia. Because written expression was not assessed within the scope of the study, no conclusion was drawn regarding the source or nature of any possible writing difficulties. Deniz enjoyed watching cartoons and frequently imitated the gestures, facial expressions, and dialogues of the cartoon characters he watched. Among the two teachers in his classroom, he referred to the teacher whom he considered a friend as "my friend," while addressing the other teacher by name. His strong interest in cartoon characters was considered when individualizing the intervention materials, and reading texts were prepared using characters and dialogues from his preferred cartoons to support his attention and engagement in the reading process.

2.3. Measures

Due to his diagnosis of dyslexia, Deniz frequently makes reading errors. In order to determine Deniz's level of word comprehension in reading texts and his performance related to word errors, the "Error

Analysis Inventory,” adapted into Turkish by Akyol (2010), was used. The inventory includes various types of errors such as omissions, additions, words provided by the teacher, repetitions, misreadings, and reversals—all classified as error types. These errors were recorded on a chart prepared by the researchers while Deniz was reading independently.

2.4. Data analysis

For each text that Deniz read independently, the Error Analysis Inventory was used to record his reading time, word errors, and types of errors. The percentage and level corresponding to the number of errors were calculated according to the guideline for determining word comprehension levels and percentages, adapted by Akyol (2010) from Ekwall and Shanker, and the results were presented under the findings section.

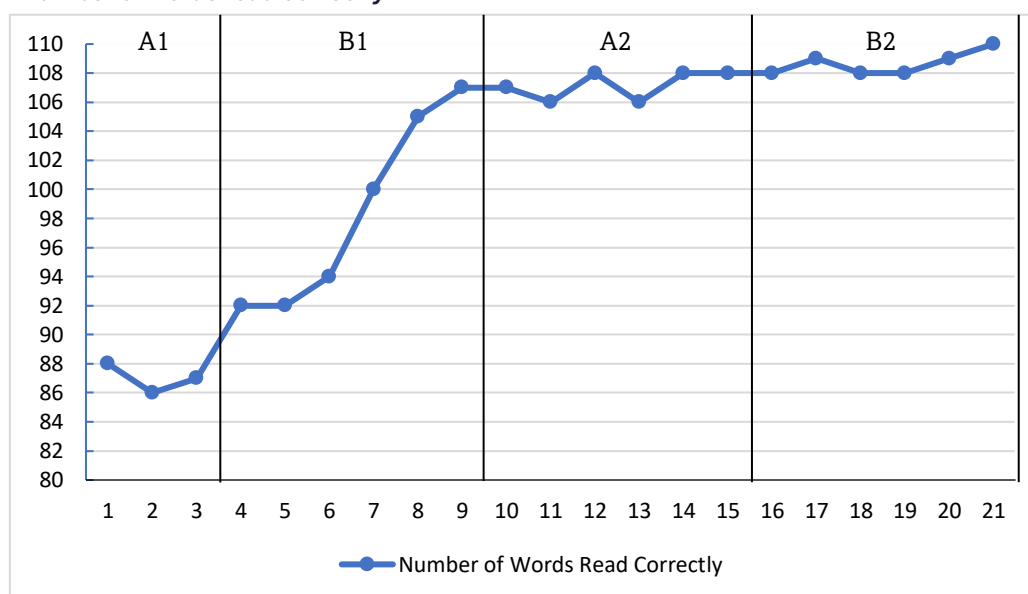
2.5. Validity, reliability, and ethical considerations

To ensure the internal validity of the study, the ABAB model—one of the single-subject experimental designs—was preferred. The A2 and B2 phases were implemented to determine whether the texts featuring cartoon characters were effective during the instructional process. Since the study was conducted at the school where one of the researchers works and allowed for direct interaction with the student, ethical committee approval was not deemed necessary for this study.

3. Findings

In this study, changes in the number of words the student read correctly in 110-word texts and in his oral reading time were monitored across four phases using an ABAB design. The A1 phase represented the baseline, the B1 and B2 phases represented the intervention phases in which adapted texts featuring cartoon characters were used, and the A2 phase represented the withdrawal phase in which non-adapted texts were reintroduced. The number of words the student read correctly in each phase is presented in Figure 2.

Figure 2 Number of words read correctly

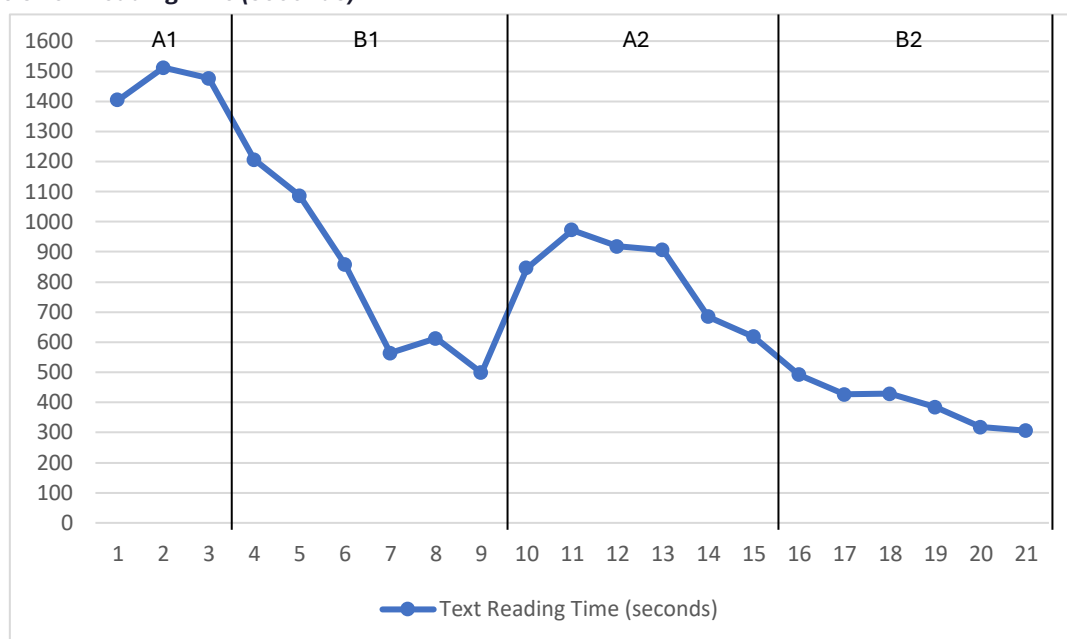


As shown in Figure 2, the number of words read correctly during the A1 phase was measured as 88, 86, and 87, respectively. Upon transitioning to the B1 phase, an increase in the number of correctly read words was observed, with values ranging from 92 to 107. This higher level of performance continued during the A2 phase, with values ranging from 106 to 108. Finally, during the B2 phase, the

student correctly read between 108 and 110 words. This pattern shows that the student's accurate reading performance increased after the transition to B1 and remained high during the A2 and B2 phases. However, because the improvement was maintained during A2, when the adapted texts were withdrawn, this pattern does not demonstrate that the observed change resulted exclusively from the adapted texts.

The student's reading time (in seconds) for the texts during all phases of the study is presented in Figure 3.

Figure 3 Text reading time (seconds)



As shown in Figure 3, considerably longer reading times were recorded during the A1 phase, ranging from 1404 to 1512 seconds. During the B1 phase, reading time decreased markedly, with values ranging from 564 to 1206 seconds. Although some fluctuations occurred across the subsequent phases, reading time generally continued to decrease over time. During the B2 phase, the student completed the texts in as little as 306 seconds. This pattern indicates an overall reduction in the student's reading time across the study process. The reading errors made by the student in the texts throughout all phases of the study are presented in Table 1.

Table 1 *Reading errors by phase*

Phases	Number of Sessions	Error Types					f
		Omissions	Skipped Words	Repetitions	Misreadings	Reversals	
A1	1	2	1	4	3	12	22
	2	3	2	6	3	10	24
	3	1	1	5	4	12	23
B1	1	2	1	4	2	9	18
	2	2	2	3	3	8	18
	3	1	2	2	3	8	16
	4	1	1	1	1	6	10
	5	–	–	1	1	3	5
	6	–	–	–	1	2	3
A2	1	–	–	–	1	2	3
	2	–	–	–	2	2	4
	3	–	–	–	1	1	2
	4	–	–	–	3	1	4
	5	–	–	–	1	1	2
	6	–	–	1	1	–	2
B2	1	–	–	–	2	–	2
	2	–	–	–	1	–	1
	3	–	–	–	1	1	2
	4	–	–	–	1	1	2
	5	–	–	–	1	–	1
	6	–	–	–	–	–	0

In the study, both the types and frequency of reading errors showed a marked improvement from phase A1 to B2. According to the Error Analysis Inventory adapted into Turkish by Akyol (2010), the high number of errors and the anxiety-level performance observed in the A1 phase gave way to a decrease in errors and an increase in reading accuracy beginning with the B1 phase. Notably, by the end of the B1 phase—where adapted texts were used for the first time—the student reached the instructional and independent reading levels.

These gains were maintained even during the A2 phase, where non-adapted texts were reintroduced; the number of errors further decreased compared to B1, and the accuracy rate remained high. Finally, in the B2 phase (with cartoon-character adapted texts reintroduced), the student's reading became almost error-free. The 98–100% accuracy rate reached in this phase indicates that the student achieved a fully independent reading level.

Overall, the findings show that the student's reading accuracy increased and reading errors across all categories decreased over the course of the study. According to the criteria of the Error Analysis Inventory, the student's reading performance progressed from the frustration level at baseline to the independent reading level by the end of the study. However, because the gains were maintained during the A2 phase, when the adapted texts were withdrawn, the observed improvements cannot be attributed exclusively to the cartoon-adapted texts. These results reflect changes in the student's performance across the overall instructional process and should not be interpreted as conclusive evidence of the isolated effect of the adapted texts.

4. Discussion

In this study, the relationship between reading texts adapted with cartoon characters and the reading performance of a student with co-occurring diagnoses of ASD and dyslexia was examined. The findings showed that the number of words read correctly increased, reading errors decreased, and the time required to complete the texts became shorter across the intervention process. According to the Error Analysis Inventory adapted into Turkish by Akyol (2010), the student's reading performance progressed from the frustration level at baseline to the independent reading level by the end of the study. In particular, the student was observed to complete the texts in less time and with fewer errors during the phases in which texts featuring cartoon characters were used. This pattern suggests that interest-based adapted texts used in conjunction with guided and repeated reading may have supported the development of the student's reading fluency.

The findings are generally consistent with those of previous repeated-reading studies involving students with reading difficulties. Yılmaz (2006) found that repeated reading reduced reading errors and improved the reading levels of four third-grade students experiencing reading difficulties. Kaman (2012), in a study conducted with students from two socioeconomically comparable third-grade classrooms, reported that students in the experimental group who participated in a 10-week repeated-reading intervention demonstrated significant improvements in their reading levels and reading comprehension compared with the control group. Erbasan and Erbasan (2022) similarly found that a repeated-reading and word-repetition intervention implemented with a second-grade student experiencing reading difficulties improved the student's reading level from the frustration level to the instructional level. In the present study, the reduction in reading errors and reading time alongside repeated-reading practice is consistent with these findings regarding the potential contribution of regular and structured reading practice to fluency development.

Studies in the international literature also indicate that structured and individualized reading interventions may support the reading skills of students with ASD and students experiencing reading difficulties. Bryant et al. (2000) reported improvements in oral reading fluency and accuracy for most students following a four-month program that combined repeated reading, collaborative strategic reading, and word-recognition techniques; however, some students with particularly low initial reading levels demonstrated more limited progress. In a study involving three young children with ASD, Simons et al. (2022) found that an intervention combining repeated reading with performance-contingent rewards and error correction could support reading fluency. A systematic review conducted by Bailey and Arciuli (2020) also found that reading interventions for children with ASD could produce gains in phonics, reading accuracy, fluency, and reading comprehension; however, the authors emphasized that the methodological quality of the existing studies varied and that the findings should be interpreted cautiously. These findings indicate that the improvements observed in the present study are consistent with structured reading interventions involving repeated practice, while also demonstrating that students may differ in their responsiveness to such interventions.

An important characteristic distinguishing the present study from much of the previous research is that the participant had co-occurring diagnoses of ASD and dyslexia. Coulter and Sasnett (2016), in a case study involving a child with ASD and co-occurring neurodevelopmental characteristics, including attention-deficit/hyperactivity disorder and a specific learning disability, reported that a multicomponent intervention tailored to the student's individual learning profile produced marked gains in reading achievement. Similarly, recent literature indicates that the co-occurrence of dyslexia and other neurodevelopmental conditions is not exceptional and that interventions should be planned according to the learner's behavioral, cognitive, and academic profile rather than a single diagnostic label (Brimo et al., 2021; Vale et al., 2022). Accordingly, the slow oral reading, word-level inaccuracies, and decoding difficulties observed in the present study were interpreted primarily in relation to the participant's diagnosed dyslexia, whereas ASD was considered relevant to the use of his individual interests and motivational characteristics in designing the intervention. Thus, the findings were interpreted by considering the different functional relevance of both diagnoses within the student's individual learning profile rather than attributing the reading difficulties exclusively to either ASD or dyslexia.

The inclusion of cartoon characters in the reading texts was based on incorporating the student's individual interests into instruction. Mandak et al. (2019) reported that digital books incorporating dynamic text and speech features could improve target-word reading in preschool children with ASD. However, findings from recent studies in which the preferred or restricted interests of students with ASD were embedded in reading texts have not been entirely consistent. Marshall and Myers (2021) reported limited and variable effects of embedding interests in texts on the reading comprehension performance of two participants. Solis et al. (2022) similarly found that interest-based texts supported vocabulary and reading comprehension outcomes for some students, although the effects varied according to student characteristics and the instructional context. Therefore, the improvements observed in the present study should not be attributed solely to the use of cartoon characters. The findings may reflect the combined influence of interest-based adapted texts, guided reading, repeated reading, practitioner support, and the experience gained by the student throughout the intervention.

The pattern of change across phases should also be considered when interpreting the findings obtained from the ABAB design. Improvements in the student's performance continued during the A2 phase, in which non-adapted texts were reintroduced after the B1 phase involving cartoon-adapted texts. The maintenance of gains during the A2 phase may be regarded as educationally positive because it suggests that the improvement transferred to different texts. However, the absence of a return toward baseline performance during A2 makes it difficult to establish a conclusive functional relationship showing that the observed improvements resulted exclusively from the cartoon-adapted texts. Practice effects associated with repeated implementation, learning carried over from previous phases, guided reading, and the student's increasing reading experience over time may also have contributed to the findings. Therefore, the results should be interpreted as preliminary evidence concerning the use of individualized materials alongside structured reading instruction rather than as conclusive evidence of the isolated effect of cartoon-adapted texts.

Reading rate and accuracy are among the principal components of reading fluency. Frey and Fisher (2018) recommend that students read short texts multiple times until they achieve adequate levels of both rate and accuracy during repeated-reading interventions. In the present study, each text was similarly read multiple times, and the student's reading time, number of correctly read words, and reading errors were recorded. The decrease in reading errors accompanying the reduction in reading

time indicates that the student began to read not only more quickly but also more accurately. Recent research indicates that decoding and fluency may contribute to the reading-comprehension performance of children with ASD (Peristeri et al., 2024). However, because reading comprehension was not directly measured as a dependent variable in the present study, it cannot be concluded that the improvements in reading rate and accuracy also transferred to reading comprehension.

The findings also offer several practical implications for teachers and families. Teachers may identify students' individual interests, adapt reading texts according to those interests, and use these materials in combination with structured practices such as guided and repeated reading. Regularly recording reading time, the number of words read correctly, and reading errors may help teachers monitor student progress and adjust instruction according to the resulting data. Families, in collaboration with teachers, may support school-based instruction by using short reading activities at home that incorporate the child's preferred characters and topics. Nevertheless, because students differ in their interests, diagnostic profiles, and reading needs, the practice used in this study should not be assumed to be equally effective for all learners. Instruction should be planned according to each student's assessment results and individual response to the intervention.

4.1. Limitations and future directions

This study has several limitations. First, because it was conducted with a single participant, its findings cannot be generalized to all students with ASD, dyslexia, or co-occurring ASD and dyslexia. The participant's individual diagnostic profile, educational placement, prior reading experiences, and interest in cartoon characters may all have influenced his response to the intervention. Second, although an ABAB design was used, the participant's performance did not return toward baseline during the A2 phase. Consequently, a conclusive functional relationship between the use of cartoon-adapted texts and the observed improvements could not be established. The gains may also have been influenced by cumulative practice, carryover effects, guided reading, and repeated exposure to the texts. Third, the intervention lasted 10 weeks and included only one type of interest-based adaptation. Moreover, the study focused on oral reading time and reading errors; reading comprehension and writing performance were not measured. Therefore, the findings should be interpreted as preliminary, participant-specific evidence rather than proof that cartoon-adapted texts are effective for all learners with similar diagnoses.

Future research should employ replicated single-subject designs or group-based experimental studies involving participants with diverse diagnostic and reading profiles. Studies could compare cartoon-adapted texts with other interest-based and non-adapted materials across different text types, such as stories, poems, fairy tales, and informational texts. Future investigations should also include direct measures of reading comprehension, motivation, and the maintenance and generalization of acquired skills, as well as follow-up assessments conducted after the intervention. These steps would help clarify which components of the intervention are effective, for whom they are effective, and whether the gains persist over time.

4.2. Conclusion

This study found that the participant's reading accuracy increased and oral reading time decreased across the ABAB process, in which guided and repeated reading was implemented while alternating between non-adapted texts and texts adapted using preferred cartoon characters. According to Akyol's (2010) Error Analysis Inventory, the participant's reading performance progressed from the frustration level at baseline to the independent reading level by the end of the study. Noticeable decreases were observed particularly in reversals, repetitions, and misreadings. However, the gains

were maintained during the A2 phase, and the participant's performance did not return toward baseline after the withdrawal of the cartoon-adapted texts. Therefore, the observed improvements cannot be attributed exclusively to the cartoon-adapted materials. The findings provide preliminary, participant-specific evidence that combining interest-based text adaptation with structured reading instruction may support the reading development of a student with co-occurring ASD and dyslexia.

Overall, the results suggest that repeated practice, guided support, and individualized materials may contribute to the development of reading fluency. Teachers may use students' preferred interests to increase engagement while continuing to provide explicit, evidence-based instruction targeting reading accuracy, decoding, and fluency. Families may reinforce school-based instruction through brief and supportive home-reading activities developed in collaboration with teachers. Nevertheless, further research involving designs that demonstrate experimental control more clearly, larger and more diverse participant groups, direct measures of reading comprehension, and follow-up assessments is needed before the effectiveness of cartoon-adapted texts can be generalized.

5. Declarations

5.1. Conflict of interest

The authors declare that there is no conflict of interest regarding this study.

5.2. Funding

This study received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

5.3. Author contributions (CRediT)

All researchers involved in this study contributed equally to every stage of the research. The development of the research idea, implementation process, data collection and analysis, evaluation of the results, and the writing of the article were carried out collaboratively.

Author 1 Berkay Ömer Ünal: Conceptualization; Implementation; Data Curation; Formal Analysis; Writing – original draft.

Author 2 Özsoy: Conceptualization; Methodology; Validation; Resources; Writing – review & editing.

5.4. Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

5.5. Ethics approval

Ethics committee approval was not required for this study, as it was conducted by the first author, a teacher, within their own classroom setting with their student. To ensure confidentiality, the participant's real name and school information have been omitted from the manuscript.

5.6. Use of artificial intelligence (AI) tools

ChatGPT was utilized in the preparation of the reading texts used during the implementation and data collection process of this study. Prior to implementation, the generated reading texts were pedagogically evaluated and refined by the authors.

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The mediating role of listening motivation in the relationship between listening self-efficacy and metacognitive awareness¹

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ABSTRACT

The role of metacognitive awareness on learning and the increasing importance of listening in the 21st century reveal the need to examine the relationships between listening motivation, listening self-efficacy and metacognitive awareness. The aim of this study is to examine the mediating role of listening motivation in the relationship between middle school students' listening self-efficacy and metacognitive awareness. The study group consisted of 1074 middle school students attending 13 schools selected from the public middle schools. The data of the study were collected using Personal Information Form, Listening Self- Efficacy Scale, Metacognitive Awareness Scale-Form B and Listening Motivation Scale for Secondary School Students. Structural equation modeling was used to analyze the data. As a result of this study, it was determined that there were positively significant relationships between middle school students' listening self-efficacy, listening motivation, and metacognitive awareness. Higher listening self-efficacy was associated with higher levels of listening motivation and metacognitive awareness. The structural model indicated significant positive associations between listening self-efficacy and listening motivation, between listening self-efficacy and metacognitive awareness, and between listening motivation and metacognitive awareness. In addition, listening motivation played a mediating role in the relationship between listening self-efficacy and metacognitive awareness. Based on the findings, listening instruction may incorporate metacognitive listening strategies to support students' metacognitive awareness, while also giving greater attention to affective factors such as listening motivation and self-efficacy.

KEYWORDS: Listening skills; Listening self-efficacy; Metacognitive awareness; Listening motivation; Structural equation modeling

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1. Introduction

In the 21st century, listening has become more important than ever (Wolvin, 2010). With the increase of online learning environments, students have started to use more visual and auditory tools (Hubbard, 2017). Technological developments in listening skills have further increased the

¹ This study is based on data from the master's thesis titled "The relationship between listening self-efficacy, listening motivation and metacognitive awareness: A structural equation modeling", authored by the first author under the supervision of the second author.

importance of metacognitive awareness (MA). Indeed, awareness of the information learned from the listening source is related to using metacognitive skills (Goh, 2017). Greater control, strategy selection and use in listening activities are associated with higher self-efficacy and motivation (Bourdaud'hui et al., 2021; Rahimi & Abedi, 2014). It can be stated that when Listening Motivation (LM) and Listening Self-Efficacy (LSE) are high, students have more control over what they listen to (Landine & Stewart, 1998). Consciously attending to spoken input, monitoring comprehension, recognizing difficulties during listening, and organizing the information obtained are among the metacognitive processes that may be associated with higher levels of listening motivation and self-efficacy. The concept that these features correspond to can be defined as MA (Flavell, 1979). Accordingly, a model was established to examine the mediating role of LM in the relationship between LSE and MA. The existing literature shows that no study has examined LSE, LM and MA together. Studies on self-efficacy and MA, especially concerning listening skills, are mostly conducted on second or foreign language teaching (Bozorgian, 2014; Canaran et al., 2020; Cross, 2010; Davoudi & Chavosh, 2016; Fathi et al., 2020; In'nami & Koizumi, 2022; Rahimirad & Zare-ee, 2015; Sok & Shin, 2022), whereas studies on LM are very few in both first, second and foreign language teaching (Bourdaud'hui et al., 2021; Lau, 2017; Yekeler-Gökmen, 2020). Although listening in one's native language may appear to be an automatic process that occurs naturally in everyday life, listening at critical and academic levels requires conscious mental focus beyond mere hearing (Harmankaya & Melanlıoğlu, 2017; Özbay & Daşöz, 2014). Indeed, it has been suggested that this skill, often assumed to develop naturally, is not sufficient on its own to enable individuals to question and evaluate what they hear unless it is supported by systematic metacognitive awareness (Harmankaya & Melanlıoğlu, 2017; Melanlıoğlu, 2012). For this reason, it is believed that examining the mediating role of LM in the relation between LSE and MA in this study will be instructive in terms of improving listening skills and metacognitive skills of middle school students receiving mother tongue education.

1.1. Literature Review

1.1.1. Listening Self-Efficacy

Listening skills are affected by many cognitive and affective factors. Trust in listening from an affective perspective has a determining role in listening performance (Chen, 2007). One of the concepts in the affective dimension of listening is self-efficacy. Graham (2011) defined LSE as individuals' trust in understanding what they listen to. Yıldız (2021) defines the concept as "the individual's belief about whether he/she can perform the act of listening effectively" (p. 41). Based on these definitions, it is believed that an individual's self-perception of competence is necessary for listening comprehension success (Rahimi & Abedini, 2009). When this belief is not strong, students cannot be expected to engage in effective listening activities. If students' LSE is high, it enables them to show effort in the face of difficulties in listening comprehension. In contrast, low LSE causes them not to show any effort (Bandura, 1997). In addition, students with strong LSE have more beliefs about succeeding in the listening process. On the other hand, students with low LSE have listening anxiety (Graham, 2011). Aydın, Demircan and İnnalı (2015) state that feedback, self-evaluation, self-regulation and self-efficacy are effective in developing listening skills, and also state that the individual should evaluate the listening activity and develop a perception of competence. Existing literature indicates a positive, albeit variable, predictive relationship between LSE and listening comprehension (Du & Man, 2023; Mills et al., 2006), suggesting that fostering LSE may be a key factor in supporting students' listening skills.

1.1.2. Metacognitive Awareness

Today, the concept of metacognition is the subject of study in many fields, including education. Many definitions have been made in the literature for metacognition, which has a complex structure, and its boundaries have been tried to be determined. According to John Flavell (1976), the pioneer of the concept, metacognition refers to one's knowledge about cognitive processes. Flavell (1979) emphasizes metacognitive knowledge, metacognitive experiences, objectives (tasks) and actions (strategies) in monitoring cognition. According to him, cognitive activities are realised through these four elements and their interactions (Flavell, 1979). Metacognition includes knowledge of cognition and regulation of cognition (Brown, 1987). Regulation of cognition is the control and management of learning activities; knowledge of cognition is the individual's current understanding of their own cognitive processes (Brown, 1987). When the relationship between the concept and cognition is examined, it is stated that while it is the function of cognition to bring cognitive activities to the desired result and to find solutions to problems, it is the function of metacognition to regulate the cognitive mechanism of the individual while performing these activities (Vos, 2001). Veenman et al. (2006) also state that metacognition is not only a structure that controls cognition but also a part of cognition. According to Costa (1984), metacognitive skills refer to the individual's ability to plan the strategies they need in their learning, to analyze the degree of impact of their ideas, and to be aware of the appropriate strategy and solution stages of a problem. Recent empirical studies have also provided support for the role of metacognitive awareness in educational and listening contexts. Self-efficacy has been associated with metacognitive awareness among middle school students (Oğuz & Kutlu-Kalender, 2018), while metacognitive awareness has been linked to listening motivation and critical listening in L1 learners (Bourdeaud'hui et al., 2021), and metacognitive listening strategies have been found to positively predict critical listening attitudes and academic listening skills (Polatcan et al., 2025). In this sense, it is believed that metacognition is a fundamental component for listening.

1.1.3. Listening Motivation

Motivation is one of the factors that are effective in teaching the four basic language skills. When it is considered in terms of listening skills, motivation is defined as the state of the willingness of the individual towards the listening activity, and it motivates the individual to listen and perceive what he/she listens to (Dölek & Yıldırım, 2021). Motivation is important in listening skills because the concept is effective in developing communication skills (Ajmal & Kumar, 2020). Motivation is broadly conceptualized in terms of intrinsic motivation, extrinsic motivation, and amotivation (Deci & Ryan, 1985; Ryan & Deci, 2000). In the context of listening, the present study focuses on the dimensions of benefit, interest, and amotivation (Dölek & Yıldırım, 2021). Benefit refers to the perceived benefits of listening, whereas interest reflects students' interest in engaging in listening activities. Amotivation, in turn, refers to a lack of motivation toward listening (Dölek & Yıldırım, 2021). In this respect, it can be said that students with low motivation for listening or who experience amotivation may have difficulty completing listening activities successfully. Since motivation is one of the factors necessary for listening comprehension (Jafari, 2010) and success in using listening strategies (Chen et al., 2014; Vandergrift, 2005), there is a need to improve this feature in language education through various studies.

1.2. The Current Research

In this study, a model was created in which the mediating role of LM was hypothesised in interpreting the relation between LSE and MA. LSE positively predicts LM considering the power of self-efficacy to influence motivation in Bandura's social cognitive theory (Bandura, 1986). In language teaching, writing self-efficacy affects writing motivation (Pajares, 2003), and the positive relation between

critical reading self-efficacy and reading motivation (Şahin, 2019) shows the determining role of self-efficacy on motivation. The fact that LSE positively affects listening comprehension (Du & Man, 2023) shows that this factor increases listening success. LSE also has a determining role in MA. Considering that high self-efficacy positively affects the use of cognitive and metacognitive strategies (Linnenbrink & Pintrich, 2003), students with high LSE are expected to use metacognitive strategies more often and effectively. The fact that self-efficacy is an effective factor in developing metacognitive skills (Wibowo et al., 2018) makes it necessary to examine the effect of L1 LSE on MA. Another effective factor in MA is LM (Bourdeaud'hui et al., 2021). Motivation affects the use of metacognitive strategies (Sungur, 2007). Accordingly, students with high LM are expected to have more MA. Based on the effect of LM on MA, this study investigated the predictive power of LM on MA. In this direction, based on the predictive power of LSE on MA, the predictive power of LSE on LM and the predictive power of LM on MA, this study investigated the mediating role of LM in the relation between LSE and MA. Examining the relationship between these three variables, Landine and Stewart (1998) found positive relationships between self-efficacy, motivation and metacognition use; that is, using metacognitive strategies is associated with high self-efficacy and intrinsic motivation of the students. While previous research, particularly in L2 contexts, provides support for these relationships, their applicability to the more automatized processes of L1 listening requires empirical examination. The following hypotheses were tested in the theoretical model based on the literature:

H1. There are significant relationships between LSE, LM and MA.

H2. LSE positively predicts LM.

H3. LSE positively predicts MA.

H4. LM positively predicts MA.

H5. LM plays a mediating role in the relationship between LSE and MA.

2. Method

2.1. Participants

The participants of the study were 1074 middle school students from 13 public middle schools selected through convenience sampling in a province located in northeastern Türkiye. Of the 1074 students, 580 were female (54%) and 493 were male (45.9%). In terms of grade level, 291 students were in 5th grade (27.1%), 244 students were in 6th grade (22.7%), 286 students were in 7th grade (26.6%) and 253 students were in 8th grade (23.6%). It was determined that the socioeconomic status of the majority of the students was medium (76.1%), followed by high (18.7%) and low (3.7%) levels respectively.

2.2. Measures

Personal Information Form: A four-item personal information form was developed by the researcher to get some personal and demographic information from the students. The form includes questions on gender, grade level and family socioeconomic level.

Listening Self-Efficacy Scale: This scale was developed by Aydın et al. (2015) to find out the LSE perceptions of middle school students. In the five-point Likert-type scale, items are scored between not good at all (1) and very good (5). A single-factor, 56-item scale was obtained. The calculated Cronbach's alpha coefficient of the scale is 0.97. The original validation study supported a single-factor structure for the scale, resulting in a 56-item unidimensional measure of listening self-efficacy (Aydın et al., 2015). In this study, the Cronbach's alpha coefficient of the scale was determined as .95.

Listening Motivation Scale for Secondary School Students: It was developed by Dölek and Yıldırım (2021) to find out the LM of middle school students. The scale is given in five-point Likert-type, and the scores of the items are rated from strongly disagree (1) to strongly agree (5). It is composed of three factors and 14 items. The first factor is named "Benefit", the second factor is named "Interest", and the last factor is named "Amotivation". The internal consistency coefficient of the scale was found .81; .77 for the first factor, .72 for the second factor and .74 for the last factor (Dölek & Yıldırım, 2021). The Cronbach's alpha coefficient of the scale was calculated as .81 in this study. It was found to be .75 for the first factor, .77 for the second factor and .82 for the last factor. Following the original scoring procedure, the four items in the Amotivation subscale were reverse-coded before the analyses (Dölek & Yıldırım, 2021). Thus, higher scores on this subscale indicate lower levels of amotivation.

Metacognitive Awareness Scale for Children-B Form: Karakelle and Saraç (2007) adapted the Metacognitive Awareness Scale (Jr. MAI) into Turkish which was developed by Sperling et al. (2002) to measure metacognitive skills in 3rd-9th grade students. Form B was developed for 6th, 7th, 8th and 9th-grade students, and there are 18 items in the form. The scale is given in a five-point Likert type, and the scores of the items are rated from never (1) to always (5). Cronbach's alpha value for Form B was found to be .80, and the test-retest correlation value was determined as .72. Although the original validation study identified a four-factor structure, the authors reported that a single-factor solution provided a more appropriate representation of the construct (Karakelle & Saraç, 2007). In this study, the Cronbach's alpha coefficient of the scale was determined as .85.

2.3. Data Collection

Before collecting the data, permissions for scale use were obtained from the owners. Then, Ethics Committee permission was obtained from Trabzon University (Date: 29.12.2022, Issue no: E-81614018-000-2200056636), and Scientific Research permission was obtained from the Trabzon Provincial Directorate of National Education.

After obtaining permission for data collection, 13 schools were selected from the official secondary schools in Trabzon province. Schools with varying socioeconomic backgrounds were carefully chosen. The data were collected by the researcher in the fall and spring semesters of the 2022-2023 academic year. The researcher obtained permission from the school administration, entered the designated classrooms and carried out the applications herself. The scales were administered to 5th, 6th, 7th and 8th-graders from randomly selected classes in the schools in a single class hour. Attention was paid to applying the scales in one class from each grade level. Before the scales were administered, the researcher informed students about the study and that the data would not be used for any purpose other than the study. In addition, it was emphasized that participation was voluntary, and students who signed the Participation Acceptance Form participated in the study. Students were also informed that they would not receive any grades or rewards for their participation. It took approximately 25-30 minutes to complete the scales. The researcher explained the parts of the scale items that the students did not understand and made sure that the students did not leave any blank items. 1282 secondary school students were included in the study. However, 125 forms in which one or more scales were not filled in or were filled in randomly and filled in by students with special needs were excluded from the scope of the study. However, the study was conducted with the remaining 1074 participants after 83 data were removed in the outlier analysis.

2.4. Data Analysis

In the study, the mediating role of LM in the relation between LSE and MA was examined through equation modelling. Before the analysis, item parceling was employed for the LSE and MA scales. The LSE scale was represented by three parcels, whereas the MA scale was represented by two parcels. Compared with the use of individual items, parceling may reduce the likelihood of measurement error due to the smaller number of indicators and increase the likelihood of meeting the assumption of multivariate normality (Sass & Smith, 2006). In this study, the item-to-construct balance approach was used as the parceling strategy, in which items with relatively high and low factor loadings were distributed across parcels to obtain balanced indicators of the corresponding latent construct (Little et al., 2002).

After excluding forms with incomplete or invalid scale responses, the retained dataset still contained some item-level missing values, as identified through Missing Value Analysis in SPSS 23. These missing values were handled using mean value assignment before the outlier analysis. In the data set, univariate outliers can be defined as the values obtained by standardising the raw scores and converting them into z scores outside the ± 3 range (Mertler & Vannatta-Reinhart, 2017). In this study, the raw scores were standardized and converted into z-scores and 19 data outside the ± 3 range were excluded. Mahalanobis distance values were used to identify multivariate outliers in the data set (Kline, 2016). Accordingly, 64 data with a significance value of $p < .05$ were deleted from the data set. To determine the normality of the data, kurtosis and skewness values were calculated. Skewness values ranged between -0.08 and -0.60; kurtosis values ranged between -0.22 and -0.78. In the study, linearity was tested using the P-P plot and curve estimation analysis. The P-P plot diagram found that the residuals were arranged in a straight line. In the Curve Estimation analysis, the F values were significant ($p < .001$) and higher than the relationship shapes other than linearity. The study tested covariance by examining the scatter diagram containing the standardized regression estimates. It is found that the residuals are roughly grouped and distributed in a rectangular shape. For multicollinearity, the correlation values between the variables were first analyzed. Multicollinearity occurs when the relationship between independent variables is .90 and above (Pallant, 2005). The highest correlation in this study was .89 between the parcels of the LSE variable (see Table 1). However, as these parcels are indicators of the same latent construct, this correlation was not interpreted as evidence of multicollinearity. The multicollinearity problem was also evaluated by calculating VIF and tolerance values, and it was found that VIF values ranged between 1.11-6.29, and tolerance values ranged between .16-.91. Tolerance values less than .10 and VIF values bigger than 10 point out that there is a multicollinearity problem (Pallant, 2005). In addition, the Durbin-Watson test yielded a value of 1.96. This value was within the expected range (1-3) (Field, 2009), indicating no substantial autocorrelation of the residuals.

3. Findings

The relationships between LSE, MA and LM are given in Table 1. When Table 1 is analyzed, it is understood that there are statistically significant relationships between all of the variables.

Table 1 Relationships between variables

	1	2	3	4	5	6	7	8
1. MA1	1							
2. MA2	.77**	1						
3. LSE1	.68**	.69**	1					
4. LSE2	.69**	.70**	.88**	1				
5. LSE3	.69**	.69**	.88**	.89**	1			
6. BENEFIT	.60**	.58**	.59**	.58**	.58**	1		
7. INTEREST	.54**	.45**	.51**	.51**	.52**	.66**	1	
8. AMOT	.17**	.23**	.26**	.30**	.27**	.15**	.10**	1

Note. ** $p < .01$. MA1 = Metacognitive Awareness Parcel 1; MA2 = Metacognitive Awareness Parcel 2; LSE1–LSE3 = Listening Self-Efficacy Parcels 1–3; Benefit, Interest, and Amotivation (AMOT) = Listening Motivation Scale sub-factors.

3.1. Measurement Model

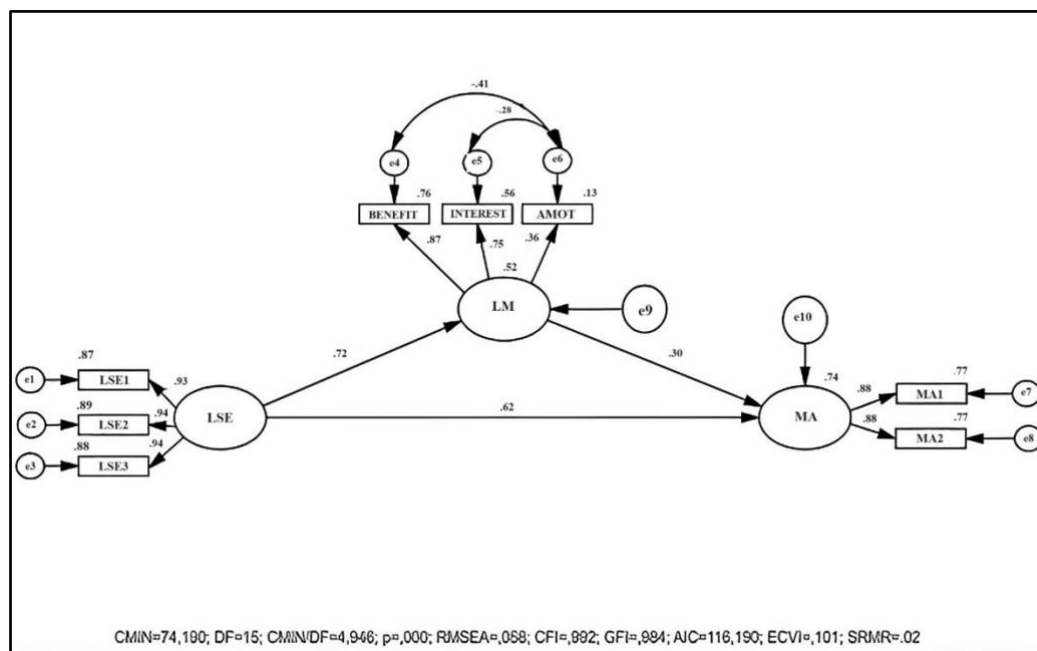
Prior to testing the hypothesized structural model, the measurement model was examined to assess the adequacy of the measurement structure. The model comprised three latent constructs –LSE, LM, and MA– and eight observed indicators. LSE was represented by three parcels, MA by two parcels, and LM by its three subdimensions (benefit, interest, and amotivation). Based on the modification indices, residual correlations were added between interest and amotivation and between benefit and amotivation. These modifications improved the fit of the measurement model. The final measurement model demonstrated an acceptable-to-good fit to the data, $\chi^2/df = 4.691$, CFI = .99, GFI = .98, RMSEA = .06, and SRMR = .02. The standardized factor loadings ranged from .36 to .95 and were statistically significant. Composite reliability (CR), calculated from the standardized factor loadings of the measurement model, was .96 for LSE, .87 for MA, and .72 for LM, indicating acceptable reliability for all three latent constructs.

3.2. Structural Model

The structural model was tested to examine the mediating role of LM in the relationship between LSE and MA. Based on the modification indices, two modifications were made sequentially. Based on the largest modification index, a residual correlation was first added between the benefit and amotivation dimensions of LM, and the model was re-estimated. The modification was evaluated by examining the chi-square difference between the models as well as changes in the AIC and ECVI values (Kline, 2016). The chi-square difference exceeded the critical value ($18.226 > 3.84$), and the AIC and ECVI values decreased; therefore, the residual correlation was retained. The second modification involved adding a residual correlation between the interest and amotivation dimensions of LM, based on the next largest modification index. These residual correlations were also considered theoretically plausible given the conceptual relatedness among the three dimensions of listening motivation. Specifically, amotivation reflects difficulties and unwillingness associated with listening, whereas benefit and interest represent positive motivational orientations toward listening. In addition, the original validation study reported meaningful associations among these three dimensions (Dölek & Yıldırım, 2021). The chi-square difference again exceeded the critical value ($39.20 > 3.84$),

accompanied by lower AIC and ECVI values; therefore, this residual correlation was also retained. Following these modifications, the final structural model demonstrated acceptable-to-good fit. The fit indices of the final structural model were $\chi^2/df = 4.946$, $p < .001$, RMSEA = .06, SRMR = .02, CFI = .99, GFI = .98, AIC = 116.190, and ECVI = .101. Figure 1 shows the parameter estimates of the final model.

Figure 1 *Parameter estimates of the final model*



Note. MA1 = Metacognitive Awareness Parcel 1; MA2 = Metacognitive Awareness Parcel 2; LSE1–LSE3 = Listening Self-Efficacy Parcels 1–3; Benefit, Interest, and Amotivation = Listening Motivation Scale sub-factors.

Figure 1 presents that the model explained 74% of the change in MA. The standardized path coefficients ranged between .30 and .72, and all of them were significant. In the study, the significance of indirect effects was calculated by creating confidence intervals (95%CI) with a bias-corrected bootstrap procedure with 10000 resampling options. Table 2 shows the model's direct, indirect, total effects and Bootstrap Analysis results.

Table 2 Direct, indirect, total effects and bootstrap analysis results for the model

Path	B	β	SE	95% CI for standardized estimate
LSE → LM (Path a)	.191	.72**	.009	.680–.766
LSE → MA (Path c)	.321	.62**	.018	.541–.691
LM → MA (Path b)	.585	.30**	.070	.216–.381
Indirect effect				
LSE → MA (a × b)	.111	.22		.156–.280
Total effect				
LSE → MA (a × b) + c	.432	.83		.804–.860
Regression Equation and Explained Variance Ratios				R^2
LM = .72 (a)				.52
MA = .30 (b) + .62 (c)				.74

Note. ** $p < .001$. B = unstandardized regression coefficient; β = standardized regression coefficient; SE = standard error; LM = listening motivation; LSE = listening self-efficacy; MA = metacognitive awareness.

When Table 2 is examined, it is observed that the direct path from LSE to LM is significant ($\beta = .72$, 95% CI [.680, .766], $p < .001$). The direct path from LSE to MA was also significant ($\beta = .62$, 95% CI [.541, .691], $p < .001$). The direct path from LM to MA was also statistically significant ($\beta = .30$, 95% CI [.216, .381], $p < .001$). When the indirect effects in the model were analyzed, it was determined that LSE showed a significant indirect association with MA through LM ($\beta = .22$, 95% CI [.156, .280]). Accordingly, LM has a partial mediating role in the model. Considering the total effect in the model, it was concluded that the direct and indirect effects of LSE on MA were significant ($\beta = .83$, 95% CI [.804, .860]). This finding indicates that LSE was positively associated with MA both directly and indirectly through LM. LSE explained 52% of LM ($R^2 = .52$), and LSE and LM together explained 74% of MA ($R^2 = .74$).

4. Discussion

The first finding of this study was that there were positive and significant relationships between LSE, LM and MA. Accordingly, it can be said that students with high LSE also have high LM and MA. There are many studies in literature that parallel this finding. Landine and Stewart (1998) showed that there are positive relationships between self-efficacy, motivation and metacognition use; students' use of metacognitive strategies is associated with high self-efficacy and intrinsic motivation. Rahimi and Abedi (2014) found a positive and significant relation between LSE and MA of listening strategies in general. It is seen that the findings of this study are supported by the studies determining that there is a significant relation between self-efficacy and achievement motivation (Zhang et al., 2015), self-efficacy and academic motivation (Ariff et al., 2022), metacognitive skills and motivation (Oğuz & Ataseven, 2016; Vandergrift, 2005). It is believed that students with high LSE will have strong beliefs that they will succeed in listening activities and will be highly motivated to listen to the listening text

or do the listening activity (Bandura, 1982; Yıldız, 2021). In the study, LSE was significantly and positively associated with LM, supporting the second hypothesis. In this respect, it can be concluded that higher levels of LSE were associated with higher levels of LM. Students willing to focus their attention and interest on the listening text, or the teacher have high levels of LM. This concept is one of the influential factors in listening. Jafari (2010) states that motivation for listening comprehension in language teaching is related to listening proficiency and that highly motivated students make more effort to improve their listening skills. Therefore, addressing factors associated with LM may also contribute to listening success. Considering the relationship between self-efficacy and motivation, LSE may also be associated with students' LM levels. A student with a high level of LSE may also have higher motivation toward listening through intrinsic and extrinsic motivators. Ungan (2014) states that for effective listening to occur, motivation must be fully provided. Motivation for listening is also related to students' high perceptions of their own efficacy. Students' self-confidence and belief in success in listening to texts and doing listening activities can enable them to make an attempt to perform that activity.

In the study, it was determined that LSE positively predicted MA. MA can be characterized as a concept that covers high-level skills such as an individual's knowledge of learning, planning and controlling their learning, and using cognitive and metacognitive strategies. For this reason, an individual's awareness of their own metacognitive skills has a positive effect on their learning (Vogel-Walcut & Fiore, 2010). High self-efficacy positively affects the use of cognitive and metacognitive strategies; cognitive and metacognitive strategies are more frequently used by people who have high belief in their ability to complete a task than by people who have low belief (Linnenbrink & Pintrich, 2003). In this respect, it can be stated that learners with high LSE are aware of which listening material to listen to and how to listen to it. Since high LSE expresses the belief that the student will succeed in the listening activity, the student can think more about what he/she listens to with self-confidence. Because LSE is directly connected to people's effective listening (Demircan & Aydın, 2019). Self-efficacy enables listeners to participate and use strategies in their listening skills (Rahimirad & Zaree, 2015). Accordingly, high LSE may also be associated with the use of metacognitive strategies. When metacognitive activities are combined with properly organized listening tasks, they can have positive effects on students' listening proficiency (Vandergrift & Goh, 2012). Students' ability to use metacognitive skills in their learning can have an impact on their academic lives (Coutinho, 2007). Accordingly, the role of LSE in relation to MA can be emphasized in mother tongue teaching at the secondary school level.

In the study, LM was significantly and positively associated with MA, supporting the fourth hypothesis. The use of metacognitive skills in listening improves listening comprehension skills (Smith, 2020). The use of metacognitive skills is closely related to LM because the individual encounters listening skills the most in daily life (Akyol, 2021) and resorts to listening while obtaining information. For this reason, it can be said that students with high LM are more motivated to use metacognitive skills for learning. According to Vandergrift and Goh (2012), individuals with high motivation use metacognitive listening activities in second language learning more than individuals with low motivation. For effective listening, the learner is supposed to have an active involvement in the listening activity process (Doğan, 2008). Observing and evaluating the listening process is related to the concept of metacognition. When students have high LM, they may be willing to engage in planning, monitoring or evaluating their learning. Indeed, students with high LM are more aware of metacognition than those with low (Bourdeaud'hui et al., 2021). In listening education, motivation and MA are of great importance in terms of students' active participation in the process (Erbilen, 2021; Vandergrift, 1990).

Metallidou and Vlachou (2007) also state that success in primary school language education depends on effort, self-confidence and the use of various strategies. LM, also addressed in mother tongue education, is positively associated with MA, which has an important place in the individual's learning throughout academic life. For this reason, it is believed that conducting studies on which both concepts are handled together is important. This finding suggests that the relationship between LM and MA should be considered in mother tongue teaching at the middle school level.

In the study, it was concluded that LM had a mediating role between LSE and MA. LSE was significantly and positively associated with MA, and a significant indirect association through LM was also observed. Thus, higher levels of LSE were associated with higher levels of MA both directly and indirectly through LM. It is seen that studies parallel to this finding have been conducted in literature. Thomas et al. (2009) determined the mediating role of recognition motivation in the relation between self-efficacy and academic adjustment and stated that learners who have more confidence in their ability to succeed tend to be more willing to learn. Koca and Dadandı (2019) determined that academic motivation has a mediating role in the relation between academic self-efficacy and academic achievement. High self-efficacy beliefs support students' academic success by increasing their motivation. Malkoç and Kesen-Mutlu (2018) also found that academic motivation mediated the relation between academic self-efficacy and procrastination. In this respect, it could be said that students with higher LSE and LM may also have higher levels of MA. Based on the findings of the study, practices aimed at enhancing LSE in mother tongue education may contribute to students' LM and, indirectly, their MA. In this context, teachers may use pre-listening activities that activate students' prior knowledge and encourage them to make predictions about the listening text, followed by listening tasks in which students monitor and evaluate their comprehension. Providing constructive feedback on students' listening performance and strategy use may also help strengthen their confidence and motivation toward listening.

4.1. Limitations and Future Directions

This study has several limitations. First, mean imputation was used to handle missing data; while this preserved sample size, it may have underestimated variability. Second, all variables were assessed via self-report measures at a single time point, which may have increased the risk of common method bias. Specifically, self-reported metacognitive awareness (MA) may not fully capture students' actual metacognitive performance during listening tasks due to inaccuracies in self-perception. Future studies could use objective or performance-based measures together with self-report measures. Future studies could also investigate the relationship between MA and other affective factors of listening, such as listening anxiety and attitude (Balta, 2018; Lien, 2016).

4.2. Conclusion

This study demonstrates the mediating role of LM in the relation between LSE and MA with a sample of middle school students. The theoretically grounded model was validated through Structural Equation Modeling analysis. The current study can be accepted as the first study examining LM in the relationship between LSE and MA. Higher levels of LSE and LM were associated with higher levels of MA among middle school students. The study underlines the significance of motivation, one of the affective characteristics in listening education. Therefore, this study is important since it provides empirical information about the relationship of motivation and self-efficacy with students' MA by emphasizing the mediating role of LM. Accordingly, middle school listening curricula should consider listening not only as a cognitive skill but also as a process in which self-efficacy, motivation, and metacognitive awareness are interconnected.

5. Declarations

5.1. Conflict of interest

The authors declare that there is no conflict of interest to disclose.

5.2. Funding

The authors declare that the study received no funding.

5.3. Author contributions (CRediT)

Selvanur Kayhan: Conceptualization; Methodology; Investigation; Formal analysis; Writing—original draft; Writing—review & editing

Bircan Eyüp: Conceptualization; Methodology; Supervision; Writing—original draft; Writing—review & editing

Author contributions were as follows: the first author contributed 60% and the second author 40% to the study.

5.4. Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available because they were collected from minors and contain information that could compromise participant confidentiality.

5.5. Ethics approval

This study was approved by the Trabzon University Social and Humanities Scientific Research and Publication Ethics Committee (Approval Date: 29.12.2022; Approval Number: E-81614018-000-2200056636).

5.6. Use of artificial intelligence (AI) tools

The authors declare that no artificial intelligence tools were used in any part of this study.

5.7. Acknowledgements

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Teachers' enactment of ICT affordances in rural ELT classrooms: A Q methodological study from Nepal¹

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ABSTRACT

Information and Communication Technology (ICT) affordances offer various pedagogical possibilities for English language teaching (ELT) worldwide. This Q methodology study explores divergent viewpoints among English teachers about how they enact ICT affordances in secondary classrooms in rural Nepal. Q-sorting was conducted with 30 secondary-level English teachers from Grades 9 to 12 in three rural districts of Nepal. Participants sorted 45 statements on ICT use in rural ELT classrooms into a forced-distribution grid. Each Q sort was followed by a post-sort interview, and all Q sorts were analysed using Brown centroid factor analysis with varimax rotation. The findings reveal three divergent viewpoints of teachers on ICT affordances' enactment in the rural ELT context: (1) practical and accessible ICT, (2) collaborative and interactive ICT, and (3) adaptive and content-driven ICT. The viewpoints also highlight barriers to ICT access and use that continue to hinder the actualisation of the affordances identified in the study. The findings are discussed in light of the literature on ICT affordances in ELT. The findings imply that offline multimodal mobile tools, collaborative ICT platforms, and authentic learning resources can scaffold vocabulary, pronunciation, and listening skills among other language skills in rural ELT settings. In this study, both online and offline mobile-based, multimodal, and collaborative affordances of ICT tools and resources enable English teachers in rural contexts to ensure authentic and meaningful language learning experiences. Stakeholders should consider potential barriers in their infrastructural, technological, and pedagogical contexts before deciding to utilise ICT affordances to deliver effective ICT-based English language instruction.

KEYWORDS: Technology enactment; Secondary ELT; Q methodology; Affordances theory; Developing contexts

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1. Introduction

The integration of Information and Communication Technology (ICT) in English Language Teaching (ELT) has been a central concern in pedagogical and academic contexts worldwide (Abel et al., 2022; Hasumi & Chiu, 2024). Yet most previous studies have focused their attention on resource-rich urban contexts, overlooking the realities of ICT integration inherent in rural ELT classrooms. For instance, in developing countries with limited ICT infrastructure and resources, such as Nepal, ICT integration

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remains in its infancy (Poudel, 2022; Rimal et al., 2025). Likewise, little has been explored on how a diverse range of ICT tools and resources afford possibilities for language learning and teaching in these pedagogical contexts. Despite the provisions made in the national curriculum frameworks to integrate ICT in the teaching of the four language skills (listening, speaking, reading, and writing) and aspects (such as grammar, vocabulary, and pronunciation) at the secondary level (Grades 9 to 12) (e.g., Ministry of Education, Science & Technology, 2019), such provisions are observed only in a few urban classroom contexts with sufficient digital resources and ICT-friendly teachers (Rana et al., 2020). Rural schools in developing contexts like Nepal face severe infrastructural challenges and deficits in technological skills (Rimal et al., 2025; Thapa & Sein, 2018). These disparities highlight the need to examine how teachers enact the ICT affordances inherent in rural ELT contexts.

Earlier studies have explored ICT integration realities in the ELT domain from diverse lenses, such as teacher experience or practices with ICT (K. R. Joshi & Poudel, 2019; Paudel, 2020; Saud & Laudari, 2023), integration, usage or impact of ICT (Bhandari & Bhandari, 2024; Bohara, 2024; Ghimire, 2022; Giri & Rana, 2022; Jora, 2019; Khadka, 2023; Shrestha, 2025), opportunities and challenges of ICT (K. R. Joshi & Ayer, 2024; Katel, 2024; Poudel, 2022), and perceptions or perspectives towards using ICT (Bhandari, 2020; R. Singh, 2019). Yet, these studies rely mainly on Likert-type questionnaires and (semi-structured) interviews. While valuable, none of these studies have utilised a holistic methodology such as Q and theoretical bases of established frameworks such as Gibson's (1977) affordances theory and F. D. Davis's (1989) Technology Acceptance Model (TAM) to illuminate how teachers enact the inherent ICT affordances in secondary ELT classrooms of Nepal.

To address these gaps, the current study employs Q methodology (hereafter referred to as Q) to capture participants' shared viewpoints through quantitative Q-sort rankings and post-sort interviews in a holistic, interpretive manner (Brown, 1980; Stephenson, 1953). Researchers prefer Q because it balances statistical factor analysis with qualitative data (Thumvichit, 2024). The study further adapts the conceptual ideas of Gibson's (1977) affordances theory and F. D. Davis's (1989) TAM to examine the possibilities of ICT tools and resources as actualised (or accepted) in rural ELT ecology. In particular, these theories guided the development of the Q sample and the interpretation of the identified factors. Moreover, they helped examine the actionable properties of ICT tools and resources, considering how useful and easy to use they were for teachers in rural ELT contexts. Against this backdrop, the study answers the research question: How do secondary-level English language teachers enact the affordances of ICT in rural ELT contexts?

2. Literature Review

In this study, theoretical insights from Gibson's (1977) affordances theory and F. D. Davis's (1989) TAM guided the identification of relevant discourse and the development of Q sample statements. A detailed theoretical exposition of these frameworks is beyond the scope of this study; instead, the literature review draws on studies that have employed these frameworks empirically in the domain of ICT affordances usage in ELT pedagogy.

2.1. ICT Affordances in ELT

Since Gibson's (1977) introduction of the concept, scholars have interpreted affordance in various ways to address its limitations and extend its applicability to broader pedagogical contexts (e.g., J. L. Davis, 2020; Moll et al., 2022). In the domain of language learning, citing van Lier (2000, 2004, 2008), Menezes (2011) describes how van Lier advanced the concept of affordances as a framework to comprehend the ways learners interact with the language learning environment, representing "a turn in the way we understand how languages are learned" (p. 60). Drawing upon Gibson (1977), van Lier

(2004) considered affordances as the emerging action potential of certain objects, surfaces, and mediums for the person within a certain physical and social world. Van Lier's (2004) conceptualisation presents affordances as relational and interactive, including features such as opportunity, immediacy, and possibility (Menezes, 2011) within specific language-learning environments. Building on this conceptualisation, the present study considers ICT affordances as actualisations of digital tools and resources by teachers and students to achieve their pedagogical goals in rural ELT contexts.

A growing body of ICT affordances research highlights the emerging potential or affordances of ICT for language learning, revealing that these technologies enhance learner autonomy, engagement, collaboration, and authenticity. Early conceptual contributions, such as Churchill et al.'s (2016) cyclical RASE (Resources, Activity, Support, and Evaluation) framework, demonstrated how resources, activity, support, and evaluation cycle to facilitate language learning in both independent and interactive contexts authentically and autonomously. More recently, Reinders and Chong (2024) proposed a conceptual CALL framework to facilitate formal and informal language instruction through offline and accessible multimodal learning tools and resources. On a similar note, Parsons et al. (2016) identified the multimodal and creative affordances of mobile phones for carrying out pedagogical activities in school classroom contexts and designing activities for a postgraduate course. Complementing these findings, Xue and Churchill (2019, 2022) highlighted several motivating and transformative potentials of mobile social media, such as WeChat, for both teachers and students of all levels, outlining affordances that include resource sharing, collaboration, evaluation, feedback, administration, and content generation for instructional purposes.

Other similar studies have explored how actualisation of ICT affordances varied across diverse pedagogical contexts. For example, Qin and Wei (2021) identified that the actualisation of technological affordances (such as the use of offline and online ICT tools) is fluid and varies according to diverse students' language-learning goals and contexts. Likewise, the multimodal, collaborative, and accessible affordances available within augmented reality (AR) devices and mobile apps (e.g., dictionaries) facilitate collaborative EFL writing and enhance vocabulary and pronunciation practice (Ilic, 2022; Xu, 2022). Similarly, McMinn (2023) outlined the metacognitive and structured language-learning potential of generative AI (GAI) tools for problem-solving and feedback.

In the Nepali context, Shrestha (2023) identified the technological and educational affordances of ICT in emergency ELT contexts for enhancing engaging and varied learning experiences for EFL learners using various tools and artefacts, such as Zoom and Mentimeter. Furthermore, examining the self-initiated, perceived, and actualised affordances of ICT training, Rana (2024) found that ICT tools were useful for teachers' professional growth and motivated students to learn the English language in rural primary EFL contexts. From an affordances theory perspective, these studies offer significant insights into the action potentials of ICT tools and their enactment in diverse ELT contexts, helping the researcher draft items for the Q sample.

2.2. Technology Acceptance Model (TAM) in ELT

Another model adapted in this study was F. D. Davis's (1989) TAM, which assisted the researcher in generating concourse for the study. TAM was initially developed to describe user acceptance of computer technology (Tuzahra et al., 2021). TAM comprises several constructs, each with a distinct role, such as perceived usefulness, perceived ease of use, behavioural intention to use, attitude toward using, and actual system use. Of these, only Perceived Usefulness (PU) and Perceived Ease of Use (PEU) were adapted in this study. Within TAM, PU refers to the extent to which a system enhances job performance, while PEU signifies the extent to which a system is effortless to use (F. D.

Davis, 1989, p. 320). These constructs were selected for their compatibility with affordances theory and for developing the methodological instruments, particularly for the initial drafting of the items in the Q sample.

In the domain of ELT, studies carried out using TAM and its subsequent models primarily noted the role of Mobile-Assisted Language Learning (MALL) or ICT-based instruction to enhance students' engagement, linguistic interactivity, and critical thinking skills (Alharbi, 2023; Rahman et al., 2021), as well as the benefits of mobile messaging apps in professional development (Dahya et al., 2019). Additionally, these studies highlighted the reality of ICT adoption: Ranjbaran et al. (2023) argued that carefully selected instructional ICT tools are less likely to be rejected and help mitigate implementation challenges. Likewise, Arif and Handayani (2022) indicated that students adopt ICT when they consider the tools to be both useful and easy to use for language learning. In the Nepali context, Parajuli (2024) emphasised the role of PU and PEU in technology acceptance, specifically the use of smartphones, in facilitating teachers' professional growth through networking and collaboration activities.

The discussion above provided brief but significant theoretical and empirical insights through the lens of Gibson's (1977) affordances theory and F. D. Davis's (1989) TAM. However, as identified in the previous section, the studies reviewed above failed to uncover the complex realities of the potential of using ICT tools in rural ELT contexts. Only a few studies drawing on affordances theory or TAM (e.g., Parajuli, 2024; Rana, 2024; Shrestha, 2023) have examined ICT in English language teaching and learning in rural areas of Nepal. Therefore, this study aims to fill the contextual gap of ICT integration in rural ELT and learning using the following methodology.

3. Methodology

This study employs Stephenson's Q methodology to examine English teachers' subjective viewpoints on enacting ICT affordances in Nepal's rural ELT context. William Stephenson introduced Q methodology in 1935 in a letter to Nature (Stephenson, 1935). Q methodology is a mixed research method that combines quantitative factor analysis and qualitative interviews to capture participants' subjective and self-referential viewpoints (Ramlo, 2016). The methodological steps included in this study were: developing the Q sample, obtaining the P sample, conducting Q sorting and post-sort interviews, analysing the data, and interpreting the results. Each of these steps is discussed in the following sections.

3.1. Developing the Q Sample

The initial step in Q begins with designing a data collection instrument called the Q sample, which is generated from a pool of all possible statements related to the topic under investigation. This pool, known as the *concourse*, reflects a broad spectrum of statements gathered from sources such as academic literature, newspapers, policy documents, focus group discussions (FGD), and interviews. Brown (1980) defines *concourse* as "the flow of communicability surrounding any topic" (p. 94). In Q literature, the Q sample is often obtained by merging the ready-made and naturalistic sampling sources. The readily available information in the form of secondary sources is referred to as *ready-made sampling*. In contrast, first-hand data collected from FGDs and participant interviews are referred to as *naturalistic sampling* (McKeown & Thomas, 2013).

In this study, the Q sample used a hybrid sampling approach, drawing on viewpoints from FGDs with English teachers and insights gained from a review of the academic literature. In the initial phase, the researcher conducted two FGDs, each with three to five community school English language teachers teaching at the secondary level. Before the FGDs, the researcher devised several prompts based on

themes such as rural English teachers' current ICT practices, the usability of mobile devices, collaborative and other ICT tools, and the pedagogical value of authentic ICT materials, drawing on affordances theory and TAM (see Appendix A). Subsequently, studies that drew on Gibson's (1977) affordances theory were consulted (e.g., Churchill et al., 2016; Ilic, 2022; McMinn, 2023; Parsons et al., 2016; Qin & Wei, 2021; Rana, 2024; Reinders & Chong, 2024; Tafazoli, 2021; Xue & Churchill, 2019, 2022; Xu, 2022). Initially, the researcher compiled a sample of 52 statements from the academic literature and FGD insights. These initial statements were refined into a set of 45 statements by consulting with experts, adhering to the Q sample design guidelines of Watts and Stenner (2012), and piloting with relevant participants.

Expert consultation involved three assistant professors specialising in ICT in education, whose feedback supported the refinement of the Q sample by ensuring statement relevance, clarity, and the elimination of redundancy. Watts and Stenner's (2012) guidelines further helped the researcher refine the statements by checking whether each conveys a single idea, avoids negatives or qualifications, is similar in length, and uses a consistent prefix. Finally, the researcher piloted the Q sample with three secondary English teachers (two males and one female), in accordance with Hertzog's (2008) recommendation for a pilot sample of 10% or fewer of the main sample ($N = 30$). Piloting helped remove highly correlated and overlapping statements that participants found less comprehensible or difficult to sort.

3.2. Obtaining the P Sample

In this study, participants were selected purposefully, considering alignment with the theoretical and strategic sampling approaches of Q (McKeown & Thomas, 2013; Watts & Stenner, 2012). Participants who had received basic ICT training and could offer significant insights into integrating ICT in rural ELT classrooms were selected as the P sample in this study. For this reason, the researcher consulted unpublished Teacher Personnel Records from the Education Development and Coordination Units (EDCUs) of Taplejung, Dhankuta, and Panchthar districts. These records revealed 258 secondary-level English teachers. Because these records did not include details on ICT training and ICT integration in ELT practices, the researcher consulted an INGO database that maintained records of ICT-trained teachers (Human Practice Foundation, 2024). Cross-referencing the INGO database with EDCUs' records revealed that 112 out of 258 (43.41%) had completed basic ICT training. From this group, 30 teachers – 10 from each of the three districts – were identified as actively integrating ICT into their ELT classrooms and therefore constituted the P sample. Table 1 below offers an overview of the P sample included in this study.

Table 1 *Participants' demographics (N = 30)*

Category	Subcategory	Frequency (n)	Percentage (%)
Gender	Male	26	86.7
	Female	4	13.3
Academic Qualification	M.Ed. in English	20	66.7
	M.A. in English (only)	4	13.3
	B.Ed. & M.A. in English	2	6.7
	M.Ed. & M.A. in English	2	6.7

Category	Subcategory	Frequency (n)	Percentage (%)
	M.A. & M.Phil. in English	1	3.3
	B.Ed. in English (only)	1	3.3
Teaching Experience	5 years or below	7	23.3
	6–10 years	8	26.7
	11–15 years	5	16.7
	More than 15 years	10	33.3
Districts	Taplejung	10	33.3
	Dhankuta	10	33.3
	Panchthar	10	33.3

3.3. Q Sorting and Post-Sort Interviews

In Q studies, data are primarily collected through a card-arranging procedure called Q sorting, followed by a post-sort interview with each participant. During the Q sorting process in this study, participants were requested to arrange the items (printed on 2 × 2-inch cards) from the Q sample onto a predetermined grid, assigning values ranging from –5 (mostly disagree) to +5 (mostly agree), with 0 (neutral) (see Figure 1). Each participant received the cards in random order; the grid required most statements to be placed in the middle (near-neutral) columns and only a few at the extremes (+5 and –5). During the sorting procedure, participants could also rearrange the cards if they changed their minds. Soon after they completed the Q-sorting process, the researcher conducted an interview based on the statements that participants placed at the furthest extremes of the Q-sort grid. A semi-structured interview, with some questions prepared beforehand, was conducted with each participant for 10 to 20 minutes.

Table 2 *Factor loadings*

Q-sort	Factor 1	Factor 2	Factor 3
P1	0.2715	0.6657 X	0.1580
P2	0.7528	0.4284	0.3456
P3	0.2784	0.2790	0.6020 X
P4	0.1401	0.6824 X	0.2251
P5	0.1664	0.6744	0.3944
P6	0.1699	0.6027 X	0.3012
P7	0.3001	0.2997	0.6226 X
P8	0.3313	0.1570	0.2874
P9	0.3840	0.0391	0.5970
P10	0.2654	0.3914	0.6623
P11	0.4611	0.1963	0.3340
P12	0.1943	0.0722	0.7253 X
P13	0.5186	0.4616	0.4174
P14	0.6130	0.3582	0.3814
P15	0.6581 X	0.3160	0.2256
P16	0.5938	0.5688	0.2261
P17	0.8007 X	0.2528	0.3204
P18	0.6876	0.2488	0.4059
P19	0.6691 X	0.2236	0.2957
P20	0.6825	0.0930	0.6252
P21	0.8207 X	0.2765	0.2819
P22	0.6445	0.3768	0.3956
P23	0.6522 X	-0.0763	0.3560
P24	0.4541	0.1660	0.5137
P25	0.6869	0.2148	0.4353

Q-sort	Factor 1	Factor 2	Factor 3
P26	0.6739	0.4627	0.3710
P27	0.2245	0.4307	0.1847
P28	0.5990	0.2802	0.3940
P29	0.6084	0.2854	0.4268
P30	0.6472	0.2121	0.6112

Note. X indicates a defining Q sort with statistical significance ($p < .05$).

Table 3 Summary of extracted factors

Factor	Label	Eigenvalue	Variance Explained (%)	Defining Q Sorts (n)	Description
Factor 1	Practical and Accessible ICT Integration	8.65	29	5	Emphasises the use of mobile, multimodal, and authentic tools to build vocabulary and pronunciation.
Factor 2	Collaborative and Interactive ICT Integration	4.17	14	3	Highlights collaborative online tools and gamified apps to foster peer feedback and speaking fluency.
Factor 3	Adaptive and Content-Driven ICT Integration	5.67	19	3	Focuses on authentic resources, adaptive technology use, and contextualised language learning.

Note. The three factors collectively explained 62% of the total study variance.

Table 4 Key statements per factor: Highest- (+5/+4) and lowest-ranked (−5/−4) items

S.N.	Statement	Score
Factor 1: Practical and accessible ICT integration		
3	Mobile apps with audio recording and playback features might be useful tools for assessing student listening and speaking skills.	+5
31	Multimedia aids like PowerPoint presentations displayed in the classroom can facilitate vocabulary learning and develop other language skills.	+5
17	The initial set-up of online communication platforms for teaching may require some investment of time and technical skills.	+4
39	A mobile dictionary with offline pronunciation is a useful resource for students to practice pronunciation and develop vocabulary.	+4
42	Offline functionality in mobile apps can be beneficial in areas with poor or no internet access for learning the English language.	+4

S.N.	Statement	Score
20	School administrations and parents should start restricting mobile apps for language learning purposes.	-5
27	Unequal access to e-devices and the Internet poses minimal challenges for mobile learning.	-5
11	Students with limited access to ICT can still apply and enhance the digital skills they acquire in school.	-4
35	Online communication tools are complex and unsuitable for my English language teaching.	-4
38	I am comfortable with assessing students' online collaborative work despite the issues of ICT access and technical skills.	-4
Factor 2: Collaborative and interactive ICT integration		
29	Collaborative online activities can enhance students' English-speaking skills when discussing with peers across the globe.	+5
31	Multimedia aids like PowerPoint presentations displayed in the classroom can facilitate vocabulary learning and develop other language skills.	+5
23	Online collaborative tools support students in developing project-based skills and interpersonal skills as envisioned in the curriculum.	+4
25	Collaborative writing activities can improve editing and revision skills through peer feedback.	+4
40	Educational games can make grammar practice more engaging, potentially increasing motivation.	+4
11	Students with limited access to ICT can still apply and enhance the digital skills they acquire in school.	-5
20	School administrations and parents should start restricting mobile apps for language learning purposes.	-5
14	Government support for ICT resources and authentic materials has minimal influence on my decision to use them.	-4
27	Unequal access to e-devices and the Internet poses minimal challenges for mobile learning.	-4
34	Limited access to technology and the internet presents only minor issues in incorporating authentic materials creatively in the classroom.	-4
Factor 3: Adaptive and content-driven ICT integration		
32	Exposing students to authentic texts like news articles, blog posts, or online articles may be beneficial for developing reading comprehension skills.	+5
39	A mobile dictionary with offline pronunciation is a useful resource for students to practice pronunciation and develop vocabulary.	+5

S.N.	Statement	Score
9	The variety of features on mobile devices distracts and hinders focus during class activities.	+4
18	Software like E-Paath and Google Classroom might be useful for assessing multiple aspects of students' English language skills.	+4
30	Online communication tools may vary in suitability depending on students' language proficiency levels.	+4
4	It is better to use other means of communication tools in rural ELT contexts instead of modern ICT and internet connectivity.	-5
35	Online communication tools are complex and unsuitable for my English language teaching.	-5
1	I am confident in handling technical difficulties during online collaborative activities.	-4
28	Integrating email and internet tools is a great way for introverted students to develop digital literacy and interpersonal skills.	-4
38	I am comfortable with assessing students' online collaborative work despite the issues of ICT access and technical skills.	-4

Note. S.N. = statement number as listed in Appendix B. Each factor presents two statements ranked at +5, three at +4, two at -5, and three at -4, reflecting the forced-distribution grid constraints (Figure 1).

4. Results

4.1. Factor 1: Practical and Accessible ICT Integration

Five participants – four males and one female – were significantly associated with this factor. Their teaching experience varied; however, on average, they had 11.4 years of teaching English in rural ELT contexts. All participants held an M.Ed. in English, and one also held an additional M.A. in English. Factor 1 had an eigenvalue of 8.65 and explained 29% of the study's variance.

In this viewpoint, teachers acted upon various mobile, multimodal, and authentic affordances of ICT to facilitate ELT despite some infrastructural and technological challenges. For example, tools such as mobile dictionaries, chat platforms, and audio applications helped teachers build vocabulary, assess listening, and develop speaking fluency (39, +4; 3, +5; 10, +2). As P19 noted, “Mobile apps correct students’ pronunciation and enhance speaking and listening skills through continuous feedback.”

The Q sorts also revealed that teachers utilised different multimodal tools and resources such as PowerPoint slides, educational games and apps, and other audio-visual resources available on platforms like YouTube in their ELT (31, +5; 40, +3; 7, +2). In this regard, P19 emphasised, “PowerPoint slides with visuals attract students, making it easier to teach language functions like directions.” Likewise, P15 commented, “Students exposed to technology early benefit from poems and rhymes, enhancing vocabulary, confidence, and competence.” Teachers belonging to this factor also valued the usefulness of authentic ICT resources such as native speakers’ speech, texts, interviews, and documentaries to offer diverse listening experiences and contextualised grammar lessons (36, +2; 6, +3; 37, +1). P23 reflected, “Authentic materials help develop fluency and necessary phonological features, improving spoken language skills.”

However, despite acknowledging the benefits of offline tools and integrating ICT for ELT (42, +4; 12, +3), participants in this factor also recognised challenges such as limited and unequal ICT access, and restricted opportunities to practice digital skills at home and at school (11, -4; 38, -4; 27, -5; 20, -5) when navigating with ICT tools in rural contexts. Highlighting these constraints, P21 noted, “Students lack ICT devices and necessary technical skills, making these activities difficult in my classroom.” Similarly, P17 remarked, “Lack of training and infrastructure creates barriers to utilising ICT affordances effectively.”

4.2. Factor 2: Collaborative and Interactive ICT Integration

Three participants – two males and one female – were significantly associated with this factor. Their teaching experience varied; however, on average, they had 17.3 years of teaching English in rural ELT contexts. All participants held an M.Ed. in English. Factor 2 had an eigenvalue of 4.17, explaining 14% of the variance in the study.

Because the sorters’ viewpoints in this group aligned somewhat with those of Factor 1, they expressed similar views on the engaging potential of multimodal ICT tools, despite infrastructural barriers. However, unlike Factor 1, participants in this group acknowledged the collaborative and interactive potentials of ICT (such as PowerPoint, collaborative online writing platforms, and mobile applications) for diverse language learning and instructional purposes. While teachers seemed to have enacted the multimodal and offline nature of ICT for optimising resources for their instruction, akin to Factor 1 (31, +5; 36, +3), they widely acknowledged the collaborative online and gamified tools for speaking fluency, learner engagement, and enhancing motivation (29, +5; 40, +4).

For example, highlighting the role of collaborative ICT tools, P1 stated, “Online activities allow students to share ideas and learn native speakers’ pronunciation, thereby supporting the development of speaking skills, among other things.” Likewise, participants in this group agreed that collaborative tools foster students’ writing skills and help them develop interpersonal skills through peer feedback features of online sites, offline platforms like E-Paath, and captioned writing tutorials (25, +4; 23, +4; 24, +3). In this regard, P4 noted, “Writing tutorials with captions help students note ideas from videos, which they can later use in writing practice.”

To some extent, teachers in this group also acknowledged that integrating online discussions, teacher support groups, and blended synchronous-asynchronous instruction via web and LMS platforms can foster students’ critical thinking, support rubric design and assessment, and address diverse learner needs and interests (8, +2; 15, +2; 21, +2). However, setting up these ICT tools required teachers to invest time and master the required technical skills (17, +3). As P6 explained, “Keeping up with ICT advancements is challenging, especially as an experienced user adjusting to new software and functions.” Like Factor 1, Factor 2 teachers also identified the issue of ICT access and its usage due to the inability of both teachers and students to implement the acquired digital skills creatively at home and at school (11, -5; 34, -4). Highlighting this issue, P1 noted, “Limited ICT access restricts students’ potential by limiting practice opportunities for language skills.” Like Factor 1, they also strongly rejected restricting mobile apps for language learning (20, -5). As P4 argued, “Parents and school administration should allow these devices since they are important tools for language learning if used judiciously.” Additionally, teachers disagreed with the idea that government support has minimal influence on utilising digital resources effectively in their ELT classroom (14, -4).

4.3. Factor 3: Adaptive and Content-Driven ICT Integration

Three participants (two males and one female) were significantly associated with this factor. On average, participants had 11 years of experience teaching English in rural contexts. Two participants

held an M.Ed. in English, while one held an M.A. and an M.Phil. in English. Factor 3 had an eigenvalue of 5.67, explaining 19% of the variance in the study.

Participants in this group primarily focused on adaptive mobile tools and resources that deliver authentic content, support diverse language skills, and enable assessment in resource-constrained settings. For instance, participants acknowledged the role of a mobile dictionary as a useful resource for helping students practice pronunciation and vocabulary (39, +5). Likewise, they argued that exposing students to authentic texts, such as news articles and blog posts, helps develop their reading comprehension (32, +5). In this connection, P7 noted, “Offline dictionaries and apps are valuable for students without internet access at home, allowing them to practice pronunciation and other language skills.”

Participants loading on this factor also considered the usefulness of content-oriented software such as E-Paath and Google Classroom for assessing multiple aspects of students’ English language skills (18, +4). While participants doubted the suitability of online communication tools (30, +4), they found some features, such as YouTube’s playback features, useful for improving students’ listening and speaking skills (44, +3). Meanwhile, they found mobile apps’ offline functionality, including audio recording and playback features, useful for assessing students’ listening and speaking skills in areas with no or poor internet access (3, +3; 42, +2). As P12 remarked, “Offline content, once downloaded, lets students study easily, helping with vocabulary and pronunciation.”

As participants disagreed with favouring traditional ICT tools over modern ICT tools and resources (4, -5), they also rejected the idea that online communication tools are complex and unsuitable for ELT (35, -5). As P3 put it, “Online communication tools aren’t complex once basics are known. Available resources make these tools meaningful and suitable for ELT.” For this reason, participants might have considered authentic materials, English media, social media discussions, and educational games as contextual and engaging ways to teach grammar and vocabulary to some extent (6, 7, 33, and 40, all +2). As with the previous factors, participants in this viewpoint noted that the issue of limited and unequal access to ICT hinders students from practising digital skills (11, -3) and poses challenges for their learning (27, -3).

5. Discussion

The objective of this study was to uncover the viewpoints of secondary-level English language teachers regarding the use and enactment of ICT affordances in rural ELT contexts. The study revealed that English teachers enacted various affordances of ICT inherent in their rural instructional contexts. As noted in the earlier section, the findings uncovered three distinct viewpoints of teachers regarding the enactment of ICT affordances: practical and accessible ICT, collaborative and interactive ICT, and adaptive and content-driven ICT. The groups of English teachers representing these viewpoints perceived some of the ICT tools and resources as useful; however, they also found such tools and resources to be complex and difficult due to various infrastructural, technological, and pedagogical issues inherent in their rural ELT contexts.

The first factor reflects the viewpoints of English teachers who enacted ICT affordances through mobile, multimodal, and authentic digital tools and resources in rural ELT classrooms. For example, participants in this factor strongly endorsed the potential of mobile and multimodal tools, as well as their implied features, for building vocabulary and assessing learners. These findings corroborate the findings of Parajuli et al. (2024), who identified smartphones as flexible teaching tools for vocabulary development in classrooms with limited ICT infrastructures. Furthermore, the findings align with Metruk (2024), who found that learners have a positive attitude towards mobile learning to enhance

their L2 pronunciation, and Kayra (2024), who emphasised the effectiveness of gamified apps with audio-visual elements for pronunciation and vocabulary practice. This factor shows that authentic materials, in the form of multimodal resources, help develop language skills and grammar and motivate EFL learners. These findings align with Reinders and Chong (2024), who emphasised that technology-based multimodal resources provide EFL learners with access to target language materials. In this line, Widyaningrum et al. (2024) also noted that digital multimodal media, like PowerPoint presentations, films, and songs, effectively enhance English language learning.

Participants associated with Factor 2 considered using multimodal, collaborative, and interactive potentials of ICT to enhance students' diverse language skills, aspects, and interpersonal skills in engaging and motivating ways. Closely correlating with the findings of Factor 1, participants of this factor acknowledged that multimedia aids, such as PowerPoint presentations, facilitate vocabulary learning and the development of listening, speaking, reading, and writing skills (Meteab & Alquraishy, 2021; Saleem et al., 2020; Vanisree et al., 2024). Another finding was that online collaborative tools and activities can facilitate project work and peer interaction, fostering students' writing and speaking skills in rural contexts (23, +4; 25, +4; 29, +5). This finding aligns with Butarbutar et al. (2023) and Demissie et al. (2025), who found that collaborative online learning environments, such as Google Docs and other shared platforms, enhance students' writing and speaking skills through features inherent in these tools. Other scholars, such as Al-Yafaei and Mudhsh (2023), Fitriani and Irawati (2024), and Yingxin et al. (2024), have further confirmed these findings, emphasising the beneficial role of collaborative platforms in improving students' writing and speaking skills.

Participants associated with Factor 3 placed greater emphasis on the diverse features of mobile apps and digital learning solutions, as well as a variety of authentic texts for developing and assessing language skills and aspects. The usefulness of a mobile dictionary for developing pronunciation and vocabulary knowledge aligns with findings from Dan et al. (2024) and Maulida et al. (2023), who found mobile dictionaries effective in improving students' pronunciation skills and enhancing both receptive and productive vocabulary knowledge. This finding reflects the potential of offline mobile apps to develop and assess students' listening and speaking skills in rural contexts, as previous studies have emphasised (A. Raj & Tomy, 2024; K. A. Raj & Baisel, 2024). Another significant finding was that exposing students to multimodal authentic texts benefits the development of reading comprehension, among other language skills and aspects (Anggraini, 2024; Mukhalladun et al., 2020; Sayi, 2024). To address the limitations of online tools and mobile app distractions, participants endorsed software such as E-Paath, YouTube, and Google Classroom as effective for assessing and enhancing English language skills (Albashtawi & Bataineh, 2020; Ghimire, 2022; Nanthinii, 2020; Tiwari, 2024).

The factors discussed above highlighted distinct viewpoints among English teachers about enacting the positive affordances of ICT in diverse rural ELT contexts. Interestingly, however, all three factors revealed similar disabling conditions or barriers to actualising the affordances identified in those factors. These include infrastructural, technological, and pedagogical barriers such as unequal access to digital devices and the internet, limited government and institutional support, and a lack of technological skills or confidence in using online collaborative tools for ELT and assessment, among others. These barriers are explicitly noted in previous studies (Gyawali, 2023; B. M. Joshi & Khatiwada, 2024; Lamichhane, 2025; Paudel, 2022; R. B. Singh, 2024), highlighting issues such as a lack of technical knowledge and skills among teachers, limited access to digital devices, unreliable internet access and connectivity, inadequate ICT infrastructure, a lack of technical support, and inadequate monitoring of ICT implementation. Although this study did not directly investigate the relationship

between PU and PEU, the findings suggest that teachers were willing to engage with ICT tools when they perceived clear pedagogical benefits for language teaching and learning, despite the challenges involved in using them.

6. Implications

The findings reported in this study have several pedagogical and theoretical implications for secondary-level rural ELT contexts. First, the study confirms the potential of mobile apps and multimedia resources (audio, video, text, etc.) to support and assess listening, speaking, reading, and writing skills, as well as vocabulary and pronunciation. Educational games and offline apps, with their offline and multimodal capabilities, help learners acquire English language skills in engaging and motivating ways. However, using them in ELT classrooms requires practitioners to consider these tools judiciously, given their distracting influence on students during language-learning activities. In practice, teachers can manage such distractions by establishing clear device-use protocols before activities begin, assigning focused task-based activities with defined linguistic outcomes, and alternating between device-based and non-device tasks to maintain student attention. Structuring mobile tool use around specific language learning objectives – rather than open-ended exploration – can help teachers harness the motivational affordances of these tools while minimising off-task behaviour in resource-constrained classroom environments.

Secondly, integrating interactive offline and online collaborative tools (e.g., PowerPoint, E-Paath, Google Docs, YouTube, Google Classroom, chat platforms) into ELT classrooms provides meaningful opportunities for language learning. These tools should be integrated to support the development of students' four language skills, including vocabulary, grammar, and pronunciation. Nevertheless, training teachers in the pedagogical use of these tools is a prerequisite for implementing them effectively in rural classrooms. Likewise, teachers in more severely resource-constrained settings can begin building collaborative pedagogical practices incrementally – starting with offline peer tasks such as shared document editing on a single device, setting up an offline learning portal on a local school server (e.g., Dhungana, 2026), progressing to asynchronous communication via platforms like WhatsApp when intermittent connectivity allows, and moving toward fuller online collaboration as access conditions improve.

Thirdly, authentic materials and resources (in their multimodal form) should be deployed in rural ELT classrooms to develop students' reading comprehension, listening skills, pronunciation, and grammar. These resources can be realised through contextualised grammar lessons and by exposing students to the diverse accents and speech patterns of English. Godwin-Jones (2016), Schmid (2016), and Stockwell (2016) also highlight that authentic language materials presented through interactive technologies and mobile devices provide real-life linguistic exposure and support task-based learning in meaningful contexts. Lastly, the study contributes to affordances theory and TAM by introducing the instructional potential of ICT, including mobility, collaboration, multimodality, and authenticity. Meanwhile, the barriers reported in the study prevent these affordances from being fully actualised, thereby transforming some of these affordances into “dormant” ones. Hence, concerned authorities should take immediate action to mitigate the barriers related to limited access to digital devices and resources, internet connectivity, and technological and pedagogical literacy.

7. Conclusion and Limitations

The study examined the subjectivities of a group of English teachers regarding their enactment of ICT affordances in secondary classrooms in rural Nepal, using Q. The findings highlight that these teachers act upon the affordances of ICT differently, considering their ability to access such

affordances for their diverse ELT goals. Despite the barriers noted earlier, teachers' enactment of three sets of affordances – practical and accessible ICT, collaborative and interactive ICT, and adaptive and content-driven ICT – uncovered actionable potentials of ICT that can be considered for replication in rural ELT contexts. However, before replication, identifying and mitigating infrastructural, technological, and pedagogical barriers is pivotal to effectively implementing ICT in rural secondary English classrooms.

Although this study highlighted significant pedagogical insights and theoretical implications, it is not without its limitations. The study's findings are limited to community school teachers in three rural districts of eastern Nepal. As such, they may not transfer to private schools or to urban and international ELT settings with advanced ICT infrastructure and connectivity. Likewise, the researcher primarily adapted Gibson's (1977) affordances theory and F. D. Davis's (1989) TAM to develop the initial Q sample instruments, rather than to heavily inform the discussion of the findings. This was because relevant studies conducted using the two frameworks and Q methodology were scant. Therefore, the researcher relied on studies using other methodologies and also drew on studies published in Nepali local journals. These studies offered contextual relevance to the findings; however, their academic rigour and quality may still be questionable.

In conclusion, this study examined various aspects of implementing ICT affordances in rural ELT contexts. Nevertheless, future studies can adopt more robust approaches, methodologies, and theoretical frameworks to explore the domain of ICT integration in ELT and learning in secondary education contexts. Further investigation of intra-district variations in ICT access and connectivity as contextual variables may help explain the divergent viewpoints observed in this study. It would also be valuable to examine the interaction between PU and PEU in rural ELT contexts for deeper theoretical insights.

8. Declarations

8.1. Conflict of Interest

The author declares no potential conflicts of interest with respect to the research, authorship, and/or publication of this article. For transparency, the author works as an ICT in Education Coordinator at Human Practice Foundation, whose ICT training records were used to identify eligible participants; the Foundation had no role in the study design, data analysis, interpretation, or the decision to publish.

8.2. Funding

The author confirms that no funding was received to support this research.

8.3. Author Contributions (CRediT)

Tirtharaj Dhungana: Conceptualization; Methodology; Investigation; Formal analysis; Writing – original draft; Writing – review & editing

8.4. Data Availability Statement

Data are available from the corresponding author upon reasonable request.

8.5. Ethical Approval and Informed Consent

This study was conducted as part of the author's MPhil research at the Kathmandu University School of Education, and the author's research supervisors approved its design and procedures. All participants provided written informed consent, participated voluntarily with the right to withdraw at any time, and have been anonymised (P1–P30).

8.6. Use of Artificial Intelligence (AI) Tools

The author used Grammarly and Claude (Anthropic), AI-assisted language tools, for proofreading, minor language refinement, and checking consistency between the text, tables, and appendices during manuscript preparation and proof correction. These tools were not used to collect or analyse the research data or to interpret the findings. The author reviewed all suggested edits and takes full responsibility for the content of this article.

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Appendix A: FGD Questionnaire for Concourse Generation

1. Can you share specific examples of how you currently use technology to support your English language teaching?
2. What features of technology, such as email or online platforms, do you find most helpful for facilitating communication among your students in English, both inside and outside of class?
3. In your experience, how do these communication features of email/internet platforms assist you in achieving your English language teaching goals?
4. How easy or challenging do you find integrating these communication tools into your lessons?
5. Do you use mobile apps or other portable ICT tools (e.g., tablet/smartwatch) to improve your students' language skills? If so, can you describe some specific examples?
6. What features of these mobile tools did you find particularly useful or not helpful for teaching various language skills?
7. Do you believe using these mobile tools improves the effectiveness of your teaching? Why or why not?
8. How comfortable are you using these mobile tools in your classroom setting?
9. Have you explored online collaborative tools like Google Docs, WhatsApp, and Facebook groups for students' language learning purposes?
10. Can you describe how these collaborative tools benefit your students' learning and interaction in your classroom?
11. How easy or challenging do you find managing and facilitating online collaborative activities for your students?
12. How do you utilise technology, such as online news articles or educational videos, to bring real-world contexts into your English language lessons?
13. In your view, how does integrating authentic materials through technology enhance student engagement and learning?
14. Do you find it easy or difficult to find and incorporate these authentic online resources into your lesson plans?
15. Are there any technology tools or platforms, such as games, pronunciation apps, or any websites, that you find particularly helpful for specific teaching methods in your English classes?
16. How do these tools support your chosen teaching methods and improve student learning outcomes in specific areas like grammar or vocabulary?
17. How easy or challenging is it for you to learn and use these pedagogical support tools effectively?
18. Is there anything else you want to share about your experiences using ICTs in your ELT classroom?

Appendix B: Statements and Factor Arrays

S.N.	Statements	Factor 1	Factor 2	Factor 3
1	I am confident in handling technical difficulties during online collaborative activities.	-2	-2	-4
2	Mobile apps offer students a high degree of autonomy and control over their English language learning.	+1	-1	-3
3	Mobile apps with audio recording and playback features might be useful tools for assessing student listening and speaking skills.	+5	+1	+3
4	It is better to use other means of communication tools in rural ELT contexts instead of modern ICT and internet connectivity.	0	-3	-5
5	Evaluating online resources for accuracy and appropriateness poses minimal barriers to integrating ICT into teaching.	-2	-3	-3
6	Authentic materials (e.g., native speakers' speech, text, video, etc.) might be useful for creating contextualised grammar lessons.	+3	+1	+2
7	Students can improve their English vocabulary repertoire by watching and listening to English movies, rhymes, chants, etc., in the classroom.	+2	+2	+2
8	Online discussions and presentations could stimulate critical thinking by encouraging students to analyze and respond to ideas.	-2	+2	+1
9	The variety of features on mobile devices distracts and hinders focus during class activities.	+2	0	+4
10	Chat platforms like Meta's WhatsApp and Messenger provide opportunities to improve students' speaking skills.	+2	-2	-1
11	Students with limited access to ICT can still apply and enhance the digital skills they acquire in school.	-4	-5	-3
12	Integrating ICT into existing teaching methods may impact instructional delivery, assessment, and learning outcomes.	+3	-1	0
13	Self-paced online courses and blogs might be an effective way to improve technology skills for teaching English.	+2	-1	+1
14	Government support for ICT resources and authentic materials has minimal influence on my decision to use them.	-3	-4	-2
15	Online teacher support groups may provide resources for designing rubrics and assessing individual/group performance.	+1	+2	-2
16	Sharing and working on documents through collaborative ICT tools may promote summarization and information synthesis skills during project work.	0	-2	0
17	The initial set-up of online communication platforms for teaching may require some investment of time and technical skills.	+4	+3	+3

S.N.	Statements	Factor 1	Factor 2	Factor 3
18	Software like E-Paath and Google Classroom might be useful for assessing multiple aspects of students' English language skills.	-1	0	+4
19	Collaborative online forums and chat functions offer a platform for peer-to-peer practice and the development of English language skills.	-1	+3	0
20	School administrations and parents should start restricting mobile apps for language learning purposes.	-5	-5	-2
21	Integrating synchronous and asynchronous instruction via web and LMS platforms can accommodate diverse learning needs and interests.	-1	+2	-2
22	The effectiveness of online interactive tools like polls and breakout rooms may promote participation and active learning environments.	-3	0	0
23	Online collaborative tools support students in developing project-based skills and interpersonal skills as envisioned in the curriculum.	-1	+4	-1
24	Accessibility of captioned writing tutorials (e.g., online/offline video) on laptops could enhance students' writing skills.	0	+3	+1
25	Collaborative writing activities can improve editing and revision skills through peer feedback.	0	+4	+1
26	Collaborating and exchanging ideas with peers on online platforms can decrease students' dedication and engagement towards their learning.	-3	-3	-2
27	Unequal access to e-devices and the Internet poses minimal challenges for mobile learning.	-5	-4	-3
28	Integrating email and internet tools is a great way for introverted students to develop digital literacy and interpersonal skills.	0	0	-4
29	Collaborative online activities can enhance students' English-speaking skills when discussing with peers across the globe.	-2	+5	0
30	Online communication tools may vary in suitability depending on students' language proficiency levels.	+3	-3	+4
31	Multimedia aids like PowerPoint presentations displayed in the classroom can facilitate vocabulary learning and develop other language skills.	+5	+5	+3
32	Exposing students to authentic texts like news articles, blog posts, or online articles may be beneficial for developing reading comprehension skills.	+1	+1	+5
33	Participating in authentic social media discussions could be a valuable way for students to learn English in a more contextual and engaging way.	-2	-1	+2

S.N.	Statements	Factor 1	Factor 2	Factor 3
34	Limited access to technology and the internet presents only minor issues in incorporating authentic materials creatively in the classroom.	-3	-4	-1
35	Online communication tools are complex and unsuitable for my English language teaching.	-4	-2	-5
36	Authentic materials (e.g., interviews, podcasts, and documentaries) can offer diverse listening experiences featuring various accents and speech patterns.	+2	+3	-1
37	Engaging students with offline versions of news articles and educational videos may expose them to authentic English used in the real world.	+1	+1	0
38	I am comfortable with assessing students' online collaborative work despite the issues of ICT access and technical skills.	-4	-2	-4
39	A mobile dictionary with offline pronunciation is a useful resource for students to practice pronunciation and develop vocabulary.	+4	+2	+5
40	Educational games can make grammar practice more engaging, potentially increasing motivation.	+3	+4	+2
41	Real-time feedback features in online collaborative tools may enable students to potentially receive immediate support and clarification.	-1	+1	+1
42	Offline functionality in mobile apps can be beneficial in areas with poor or no internet access for learning the English language.	+4	0	+2
43	Online communication tools like email and chat platforms are helpful for sharing resources and solving English language problems.	0	-1	-1
44	Adjustable audio/video playback features on YouTube and other apps may be a tool for improving listening and speaking skills.	+1	0	+3
45	The YouTube channel's videos, such as NCED Virtual, might offer instructional ideas for teaching English more effectively.	0	0	0

Natural disaster literacy in education: A thematic literature analysis

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ABSTRACT

The purpose of this study is to comprehensively examine research conducted between 2018 and 2024 on natural disaster literacy and disaster preparedness levels in the field of education. The study was carried out using a qualitative research approach, employing the document analysis technique. A total of 45 studies were identified through searches targeting articles and postgraduate theses published in the field of education between 2018 and 2024; however, after applying inclusion and exclusion criteria, 11 studies were included in the review. The selected studies were analyzed using descriptive analysis in terms of publication year, study type, research method, design, sample characteristics, data collection instruments, and data analysis techniques. The findings indicate that research on natural disaster literacy has increased notably in recent years; however, the studies are predominantly based on quantitative methods, survey research designs, and samples consisting mainly of pre-service teachers. It was also found that data collection instruments relied largely on scale-based tools, and that basic statistical techniques were most frequently used in data analysis. Qualitative and experimental studies were limited in number, and sample diversity remained relatively narrow. In conclusion, despite growing academic interest in natural disaster literacy, significant gaps remain in methodological diversity and depth. This study presents an overview of existing research and provides a methodological framework to guide future studies on disaster literacy in education.

KEYWORDS: Natural disaster literacy; Disaster preparedness; Document analysis; Education

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1. Introduction

In recent years, the rapid increase in environmental degradation, the growing impacts of climate change, and the disruption of natural ecosystem balance have significantly increased both the frequency and the severity of natural disasters. Changes occurring in meteorological, geological, and hydrological processes have led to more frequent and destructive events such as floods, earthquakes, landslides, droughts, and extreme weather conditions. Consequently, disasters can no longer be regarded merely as unexpected natural events; rather, they have become a multidimensional field of study encompassing social, economic, environmental, and psychological dimensions.

In contemporary literature, disasters are addressed not only as events causing physical destruction but also as complex processes that directly affect individuals' lives, social structures, and sustainable development. Disasters are therefore conceptualized not merely as nature-based

phenomena but as social phenomena that influence all dimensions of societal life (Rahim & Wu, 2015). The Disaster and Emergency Management Authority of Türkiye (AFAD, 2014) classifies disasters by their rate of development into slow-onset and rapid-onset disasters, emphasizing that both types have serious consequences for individuals and societies.

Considering that natural disasters are often triggered or intensified by increasing human pressure on nature, it can be argued that disasters are not solely the result of natural processes but events whose severity is amplified by human activities. In this context, individual and societal awareness plays a critical role in reducing the potential damage caused by disasters. At this point, the concept of natural disaster literacy emerges as a key factor in fostering informed and responsible behavior toward disasters.

Natural disaster literacy is a multidimensional competency that enables individuals to recognize potential disasters, become aware of disaster risks, understand what actions should be taken before, during, and after disasters, and make informed decisions throughout these processes (Zhang & Wang, 2022). Sözcü (2019) defines natural disaster literacy as the process of analyzing disaster-related problems, evaluating risks, and making sound, informed decisions. Natural disaster literacy has a wide range of definitions (Dere & Ateş, 2022). Although increasing disaster literacy cannot prevent disasters, it is considered an effective tool for mitigating their adverse impacts (Başbuğ Erkan et al., 2011). Indeed, studies indicate that societies with higher levels of disaster literacy demonstrate more effective preparedness behaviors and experience relatively lower post-disaster losses (Saeed & Gargano, 2022).

Efforts to reduce disaster risks are addressed not only at the individual level but also at national and international levels. International initiatives led by the United Nations, such as the Sendai Framework for Disaster Risk Reduction, aim to build disaster-resilient societies and place particular emphasis on the role of educational institutions and teachers in this process (Selby & Kagawa, 2012). In Türkiye, AFAD's educational, awareness-raising, and preparedness activities constitute important practices for enhancing natural disaster literacy.

A review of the literature reveals that studies on natural disaster literacy in Türkiye have increased notably since 2018. Existing research has primarily focused on university students', pre-service teachers', and teachers' levels of disaster knowledge, disaster awareness perceptions, and disaster preparedness (Sözcü & Aydınöz, 2019; Seven Uygun, 2022). In the international literature, disaster literacy is addressed within the framework of sub-dimensions such as disaster prevention, disaster mitigation, and disaster management, highlighting the multidimensional nature of the concept (Rahim & Wu, 2015; Ryan et al., 2020; Juhadi et al., 2021).

However, a significant portion of the existing studies has been conducted with specific sample groups, limited variables, or single research designs. Comprehensive reviews that examine methodological trends, sample characteristics, data collection tools, and data analysis approaches in an integrated and systematic manner remain limited. This situation clearly indicates the need for studies that present the general trends of research on natural disaster literacy through a holistic and systematic perspective.

An examination of the existing literature further demonstrates that research on natural disaster literacy has largely been carried out using specific samples, restricted variables, or isolated research designs (Sözcü & Aydınöz, 2019; Seven Uygun, 2022). Nevertheless, studies that comprehensively address the methodological and structural characteristics of this body of research remain scarce. Accordingly, the present study aims to fill this gap by systematically analyzing research on natural

disaster literacy not only in terms of content but also with respect to methodological and structural dimensions. In this regard, the study goes beyond merely identifying general research trends and offers an original contribution to the literature by providing a methodological roadmap for future studies.

The purpose of this study is to comprehensively examine existing research on natural disaster literacy and individuals' disaster preparedness levels, examining publication type, research methods, research design, sample characteristics, data collection instruments, and data analysis techniques. The findings of the study are expected to inform educational research and contribute to the development of educational curricula—particularly science education and teacher education programs—within the framework of disaster awareness.

2. Method

2.1. Research Design

In this study, since it aimed to systematically examine the literature on natural disaster literacy and levels of disaster preparedness, the document analysis technique, one of the qualitative research methods, was employed. Document analysis is a method that enables the researcher to obtain data by examining written materials for a specific purpose. In this process, the researcher should systematically follow certain stages. These stages include accessing documents, verifying the authenticity of the documents, understanding the documents, analyzing the data, and using the data (Yıldırım & Şimşek, 2013). Document analysis also encompasses the processes of identifying relevant sources, reading, taking notes, and evaluating them for a specific research purpose (Creswell & Poth, 2018). In this context, the present study aims to present the content-related and methodological characteristics of existing studies from a holistic perspective.

2.2. Data Collection

The study materials consist of scientific studies conducted between 2018 and 2024 on natural disaster literacy and levels of disaster preparedness. Within this scope, journal articles, master's theses, and doctoral dissertations were examined. Another inclusion criterion is that the studies were conducted within Türkiye. In order to access the relevant documents, literature searches were conducted in the National Thesis Center, Google Scholar, DergiPark, and ULAKBİM databases. During the literature search process, the keywords “natural disaster literacy,” “disaster preparedness levels,” and “document analysis” were used separately. As a result of the searches, a total of 45 studies were initially identified; however, after applying inclusion and exclusion criteria, 11 studies were included in the scope of the research.

2.3. Data Analysis

Descriptive analysis was used to analyze the data obtained through document analysis. Descriptive analysis consists of four main stages: establishing a framework, processing the data according to the framework, defining the findings, and interpreting the findings. First, an analysis framework appropriate to the purpose of the study was established, and then the data obtained were organized under themes in line with this framework. Subsequently, the data were defined and supported by direct quotations. In the final stage, the findings were explained, associated, and interpreted (Yıldırım & Şimşek, 2013). In this study, the data were systematically organized under predetermined themes, the descriptions were enriched through quotations, and interpretations were made based on these descriptions.

2.4. Identification of Themes

Within the scope of the research, 10 themes were identified in the analysis of the reviewed studies. These themes include the location of the study, year of publication, type of study, research method, research design, sample group, sample size, sampling method, data collection instrument, and data analysis method. In line with these themes, 11 studies were examined in detail, the data were processed, the findings were defined, and interpretations were made.

3. Findings

In this section, the findings obtained from the systematic review of studies on disaster literacy are presented. The data collected within the scope of the research were analyzed in line with the sub-research questions, organized into tables, and interpreted within the framework of the relevant literature. The publication years of studies on disaster literacy in education from 2018 to 2024 were analyzed, and the findings are presented in Table 1 .

Table 1 *Frequencies and percentages of studies on disaster literacy published between 2018 and 2024 by year*

Years	<i>f</i>	%
2018	0	0.00
2019	1	9.09
2020	0	0.00
2021	2	18.18
2022	1	9.09
2023	2	18.18
2024	5	45.45
Total	11	100.00

An examination of Table 1 indicates that studies on disaster literacy conducted between 2018 and 2024 exhibit an uneven distribution across years. The largest number of studies was conducted in 2024, accounting for 45.45% of the total. In contrast, only one study was published in each of 2019 and 2022, whereas two studies were published in 2021 and 2023. These findings suggest that academic interest in disaster literacy has increased markedly in recent years. To present the geographical distribution of the studies, the frequencies and percentages of locations where research on disaster literacy was conducted are shown in Table 2

Table 2 *Frequencies and percentages of the locations where studies on disaster literacy were conducted between 2018 and 2024*

Locations Where the Studies Were Conducted	<i>f</i>	%
Kahramanmaraş	2	18.18
Bitlis	1	9.09
Osmaniye	1	9.09
Nevşehir	1	9.09
Erzurum	1	9.09
Ankara	1	9.09
Artvin	1	9.09
Amasya	1	9.09
Kastamonu	1	9.09
Unspecified	1	9.09
Total	11	100.00

Table 2 presents the provinces in which the studies included in the research were conducted, along with their corresponding frequencies and percentages. It was determined that the vast majority of studies were carried out across different geographical regions of Türkiye; however, in one study, no information was provided regarding the location of the university where the research was conducted. In order to present the distribution of the studies by type, the frequencies and percentages of research on disaster literacy in education conducted between 2018 and 2024 are presented in Table 3.

Table 3 *Frequencies and percentages of study types related to disaster literacy in education conducted between 2018 and 2024*

Type of Study	<i>f</i>	%
Article	6	54.55
Master Thesis	5	45.45
PhD Thesis	0	0.00
Total	11	100.00

An examination of Table 3 shows the distribution of studies on disaster literacy according to study type. Of the 11 studies reviewed, six were journal articles, and five were master's theses. No doctoral-level studies were identified during the period under review. In order to present the distribution of the studies according to research methods, the frequencies and percentages of studies on disaster literacy in education conducted between 2018 and 2024 are presented in Table 4.

Table 4 *Frequencies and percentages of research methods used in studies on disaster literacy in education conducted between 2018 and 2024*

Study Methodology	<i>f</i>	%
Qualitative Research Method	1	9.09
Quantitative Research Method	10	90.91
Total	11	100.00

An examination of Table 4 indicates that the research methods employed in the studies were predominantly quantitative in nature. The vast majority of the reviewed studies (90.91%) were conducted using quantitative methods, while only one study adopted a qualitative approach. Following the analysis of research methods, the present review aimed to identify the research designs within which studies on disaster literacy in education were conducted. Accordingly, the frequencies and percentages of the research designs employed in the relevant studies are presented in Table 5.

Table 5 *Frequencies and percentages of research designs used in studies on disaster literacy in education conducted between 2018 and 2024*

Research Design	<i>f</i>	%
Survey Research model	3	27.27
Descriptive Survey Model	3	27.27
Phenomenology	1	9.09
Quasi-Experimental Research Model	1	9.09
Cross-sectional Survey Model	3	27.27
Total	11	100.00

An examination of Table 5 presents the distribution of the research designs preferred in the reviewed studies. The findings reveal that survey, descriptive survey, and cross-sectional survey designs were the most frequently employed research models. Following the analysis of research design distributions, the present review examined the distribution of sample sizes used in studies on disaster literacy in education. Accordingly, the frequencies and percentages of sample sizes are presented in Table 6.

Table 6 *Frequencies and percentages of sample sizes used in studies on disaster literacy in education conducted between 2018 and 2024*

Sample Number	<i>f</i>	%
0–100	1	9.09
100–200	2	18.18
200–300	3	27.27

Sample Number	<i>f</i>	%
300–400	2	18.18
400–700	2	18.18
700–1300	1	9.09
Total	11	100.00

An examination of Table 6 suggests that the sample sizes used in the reviewed studies tended to be concentrated within certain ranges. The findings indicate that sample sizes were generally between 100 and 700 participants. However, one study appears to have employed a larger sample due to the inclusion of all students enrolled in the faculty of education. The most commonly reported sample size range was 200–300 participants, representing 27.27% of the studies. Following the examination of sample size distributions, the present review further considered the distribution of sample groups employed in studies on disaster literacy in education. Accordingly, the frequencies and percentages of the sample groups included in the reviewed studies are presented in Table 7.

Table 7 *Frequencies and percentages of the sample group of the studies on natural disaster literacy in education between 2018–2024*

Sample Group of the Studies	<i>f</i>	%
Pre-Service Science Teachers	3	23.08
Pre-Service Special Education Teachers	2	15.38
Pre-Service Elementary Classroom Teachers	2	15.38
Pre-Service Social Studies Teachers	3	23.08
Pre-Service Teachers	1	7.69
Special Education Teachers	1	7.69
Teachers	1	7.69
Total	13	100.00

An examination of Table 7 suggests that the sample groups preferred in the reviewed studies predominantly consisted of pre-service teachers. In particular, pre-service teachers enrolled in science education, social studies education, and primary education programs appear to have been the most frequently examined groups. In addition, some studies included special education teachers and in-service teachers as part of the sample. Following the examination of the distribution of sample groups, the present review further considered the sampling methods employed in studies on disaster literacy in education. Accordingly, the frequencies and percentages related to sampling methods are presented in Table 8.

Table 8 *Frequencies and percentages of the studies on natural disaster literacy in education between 2018–2024 regarding the sample determination method*

Sample Selection Method	<i>f</i>	%
Purposeful Sampling	5	45.45
Simple Random Sampling	6	54.55
Total	11	100.00

An examination of Table 8 suggests the distribution of sampling methods employed in the reviewed studies. Simple random sampling appears to have been used in 54.55% of the studies, while purposive sampling was preferred in 45.45%. These findings may indicate that researchers adopted different sampling strategies, potentially aiming to balance generalizability with access to sample groups possessing specific characteristics. Following the analysis of sampling methods, the frequencies and percentages related to the data collection instruments used in studies on disaster literacy in education are presented in Table 9.

Table 9 *Frequencies and percentages of data collection tools of studies on natural disaster literacy in education between 2018–2024*

Data Collection Tools	<i>f</i>	%
Natural Disaster Literacy Scale	7	53.85
Disaster Readiness Scale	1	7.69
Disaster Literacy Scale	2	15.38
Psychological Resilience Tests	1	7.69
Semi-structured Interview Forms	2	15.38
Total	13	100.00

An examination of Table 9 suggests that the data collection instruments used in the reviewed studies varied considerably. The findings indicate that the most frequently employed instrument was the disaster literacy scale, accounting for 53.85% of the studies. In addition, disaster literacy and disaster preparedness scales appear to have been utilized in several studies. In qualitative research, semi-structured interview forms were reported to have been used. This diversity may suggest that the studies adopted a multidimensional approach to data collection. Following the analysis of data collection instruments, the frequencies and percentages related to the data analysis methods employed in studies on disaster literacy in education are presented in Table 10.

Table 10 *Frequencies and percentages of the studies on natural disaster literacy in education between 2018–2024 regarding the data analysis method*

Data Analysis Method	<i>f</i>	%
Independent Samples T-test	7	33.33
ANOVA	7	33.33
Dependent Samples T-test	2	9.52
Mann-Whitney-U Test	2	9.52
Kruskall-Wallis	1	4.76
ANCOVA	1	4.76
Descriptive Analysis	1	4.76

An examination of Table 10 suggests that the data analysis methods employed in the reviewed studies were predominantly based on quantitative statistical techniques. The findings indicate that independent-samples t-tests and ANOVA were the most frequently used analytical methods, each accounting for 33.33% of the studies. In addition, more advanced statistical techniques, such as the Mann–Whitney U test, Kruskal–Wallis test, and ANCOVA, appear to have been employed in some studies. In qualitative research, descriptive analysis was reported to have been preferred. Overall, this distribution may suggest that the studies were largely conducted within a statistical analysis framework focused on group comparisons.

4. Discussion and Conclusion

In this study, research conducted between 2018 and 2024 on natural disaster literacy in the field of education was systematically examined in terms of publication year, study type, research method and design, sample characteristics, data collection instruments, and data analysis methods. The findings indicate that academic interest in natural disaster literacy has increased markedly in recent years; however, this interest has remained limited in terms of methodological diversity and sample scope.

The results reveal that a significant proportion of the reviewed studies were concentrated in 2024. This situation is considered to be associated with the increase in social and academic awareness regarding disaster awareness, disaster preparedness, and natural disaster literacy following the large-scale disasters experienced in Türkiye in recent years. It has been emphasized in the literature that disaster experiences influence research trends and that academic output on disaster-related topics increases in post-disaster periods (Shaw, 2022). In this context, the surge in studies on natural disaster literacy during certain periods suggests that the field is closely aligned with current societal needs. However, this indicates that the disaster literacy literature exhibits a 'reactive' character—developing in the aftermath of major disasters—rather than a 'proactive' (preventive) progression. Since the fundamental aim of disaster education is to ensure preparedness before risks materialize, the concentration of academic interest exclusively in post-disaster periods may pose a risk to the sustainability of disaster education policies (UNDP, 2015).

An examination of the locations where the studies were conducted shows that the research was distributed across different geographical regions of Türkiye. This finding indicates that natural

disaster literacy is regarded as an educational issue that should be addressed not only at the regional level but also at the national level. However, the absence of information regarding the research location in some studies points to the fact that methodological reporting transparency has not always been ensured at a sufficient level. In terms of study type, it was determined that the research was concentrated at the journal article and master's thesis levels, while no doctoral-level studies were identified. This finding suggests that natural disaster literacy has not yet been sufficiently addressed through advanced academic research and that the field is still developing.

An examination of the research methods shows that the vast majority of the studies were based on quantitative approaches. The widespread use of survey and descriptive survey designs indicates that studies aiming to determine levels and make comparisons are dominant in the field of disaster literacy. The prevalence of scale-based quantitative research suggests a focus on measuring disaster knowledge, awareness, and preparedness levels (Zhang & Wang, 2022). However, the predominant use of Likert-type scales as data collection tools introduces the limitation of reliance on 'self-reported' data. Although disaster literacy is a construct that encompasses the competence to take action, scale-based studies measure participants' perceptions of disaster situations rather than their behavioral reflexes during an actual event. Given the discrepancy between individuals' perceived preparedness and their actual preparedness, it can be argued that the existing literature falls short in revealing the 'behavioral dimension' of disaster literacy. In contrast, the limited number of qualitative and quasi-experimental studies restricts in-depth exploration of disaster literacy in relation to individuals' experiences, perceptions, and emotional responses. However, disaster literacy is a multidimensional construct encompassing cognitive, affective, and behavioral dimensions (Lindell & Perry, 2012; Cutter, 2018).

The findings related to research designs reveal that survey models are predominant, while phenomenological and quasi-experimental designs are used at a very limited level. This situation indicates that intervention programs and applied educational practices aimed at improving disaster literacy have not been sufficiently represented in the literature. However, previous studies emphasize that disaster education is more effective when supported by experiential learning, problem-solving, and simulation-based activities (Chernikova et al., 2020; Ronan & Johnston, 2005). From this perspective, the limited number of experimental and quasi-experimental studies points to a significant gap in the field.

The results regarding sample groups show that the studies were predominantly conducted with pre-service teachers. The frequent inclusion of pre-service teachers in science education, primary education, and social studies education programs may be attributed to the more direct relationship between disaster education and the curricula of these fields. Also, this concentration within the sample structure suggests a tendency toward 'convenience sampling' during data collection. While preservice teachers may be receptive to theoretical knowledge, the underrepresentation of in-service teachers and school administrators—who actively experience the school ecosystem and crisis management—undermines the findings' ability to reflect the practical realities of the field (Etikan et al., 2016). Nevertheless, the limited number of studies conducted with in-service teachers and special education teachers is noteworthy. Considering the critical role of in-service teachers in transferring disaster literacy into school settings, the insufficient representation of this group in the literature can be regarded as an important shortcoming.

An examination of the data collection instruments indicates that scales measuring natural disaster literacy and disaster preparedness levels were used in most studies. The widespread use of scales suggests that certain measurement tools have been standardized in the field. However, the limited

use of qualitative data collection instruments restricts in-depth examination of individuals' subjective perceptions and emotional dimensions related to disaster experiences. Similarly, reliance on basic statistical techniques, such as independent-samples t-tests and ANOVA, limits the comprehensive examination of variables affecting disaster literacy.

In conclusion, this study demonstrates that although there has been an increase in academic interest in natural disaster literacy in recent years, the research has largely remained limited to quantitative, survey-based designs and samples primarily comprising pre-service teachers. The limited use of qualitative, experimental, and mixed-method approaches, the narrow scope of sample diversity, and the dominance of basic statistical techniques in data analysis indicate significant gaps in the existing literature. By presenting the general trends of current research from a holistic perspective, this study provides a methodological and conceptual framework to guide future research on natural disaster literacy. In conclusion, the reviewed studies indicate that the field of natural disaster literacy in Turkey is currently in an 'exploratory' stage. The field exhibits a profile that remains at a descriptive level, focusing primarily on status assessment. It is of critical importance for future research to transcend mere 'status assessment' and focus on experimental interventions aimed at enhancing disaster literacy, as well as mixed-method designs that investigate cause-and-effect relationships, in order for the field to attain theoretical and practical maturity.

4.1. Limitations and Future Directions

Based on the findings obtained in this study, several recommendations can be made for future research in the field of natural disaster literacy. First, given that existing studies are largely based on quantitative methods and survey research designs, it is recommended that qualitative and mixed-method studies be increased. Such studies may provide deeper insights into individuals' experiences, perceptions, and behaviors related to disasters. In terms of sample groups, the findings indicate that research has mostly been limited to pre-service teachers. Therefore, conducting studies that include different stakeholders such as in-service teachers, students, school administrators, and parents may contribute to a more comprehensive understanding of how disaster literacy is reflected in educational settings. With regard to data collection instruments, it is recommended that, in addition to scale-based studies, interviews, observations, and practice-based assessment tools be utilized. In this way, not only the cognitive dimension of disaster literacy but also its affective and behavioral dimensions can be addressed. Finally, it is recommended that data analysis move beyond basic statistical techniques and that analytical methods capable of examining relationships among variables in a more comprehensive manner be preferred. Studies conducted in this direction are expected to contribute to the theoretical and practical development of the field of natural disaster literacy.

5. Declarations

5.1. Conflict of interest

The authors declare that there are no financial, commercial, or personal conflicts of interest related to this study.

5.2. Funding

The authors declare that the study received no external funding.

5.3. Author contributions (CRediT)

Ebru Yılmaz: Conceptualization; Methodology; Formal analysis; Writing—original draft; Writing—review & editing

Erol Taş: Investigation; Formal analysis; Writing—original draft; Writing—review & editing

Hacı Mehmet Yeşiltaş: Conceptualization; Methodology; Investigation; Writing—review & editing

All authors reviewed the results and approved the final version of the manuscript.

5.4. Data availability statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

5.5. Ethics approval

This study is based solely on the analysis of publicly available documents, including published journal articles and postgraduate theses. No data were collected from human participants, and no personal or sensitive information was used within the scope of the research. Therefore, ethics committee approval was not required for this study. Throughout the research process, scientific and ethical principles were strictly adhered to.

5.6. Use of artificial intelligence (AI) tools

In this study, artificial intelligence tools were used only for language-related support during the preparation of this manuscript. Specifically, AI-assisted software was utilized to improve the clarity of expression, refine academic tone, and support English–Turkish translation during the editing process. No AI tool was used for generating research data, conducting analyses, interpreting results, or producing the scientific content of the study. All conceptual, methodological, analytical, and interpretive components of the research were carried out solely by the authors.

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Examining the relationship between theory of mind and counting skills in children aged 48–72 months

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ABSTRACT

Early number and counting skills constitute an important foundation for later mathematical development, while theory of mind reflects children's ability to understand beliefs, intentions, and perspectives. Although both domains involve representational thinking, empirical evidence on their association in Turkish preschool samples remains limited. This study aimed to examine the relationships between early numeracy skills and theory of mind in children aged 48–72 months. The study was designed as a cross-sectional correlational survey. The participants were 102 preschool children, including 48 girls and 54 boys, attending independent preschools in Kocaeli, Türkiye. Data were collected individually using the Early Numeracy Test and four theory of mind tasks: the Sally-Anne, Bonibon, Chocolate Bar, and Ice Cream Truck tasks. Because the data did not meet normality assumptions, Mann-Whitney U tests were used for age- and gender-based comparisons, and Spearman correlation analysis was conducted to examine associations among variables. Children aged 61–72 months scored significantly higher than children aged 48–60 months on comparison, classification, resultative counting, general number knowledge, and total early numeracy scores. Gender differences were limited, with girls outperforming boys only in classification. In theory of mind, age-related differences emerged only for the Ice Cream Truck task, whereas no gender-related differences were found. Positive and significant associations were observed between several early numeracy dimensions and the Sally-Anne, Bonibon, and Chocolate Bar tasks, while the Ice Cream Truck task was not significantly associated with early numeracy scores. The findings suggest that early quantitative thinking and social-cognitive representational processes may develop in partly related ways. Early childhood practices may therefore benefit from integrated activities that support counting, perspective-taking, and representational reasoning together.

KEYWORDS: Early numeracy; False belief; Social cognition; Quantitative survey; Early childhood education

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1. Introduction

Early number and counting skills constitute a foundational component of children's mathematical development. Longitudinal evidence shows that preschool mathematics competencies, particularly symbolic number knowledge and early counting-related skills, are associated with later mathematical achievement (Hawes et al., 2019; Nguyen et al., 2016). Number sense has also been

identified as a robust indicator of children's subsequent mathematics performance (Jordan et al., 2010). In this respect, the preschool period represents a critical developmental window for understanding how children acquire, coordinate, and use numerical representations.

Counting is not limited to reciting number words. Meaningful counting requires children to coordinate one-to-one correspondence, stable order, cardinality, abstraction, and order irrelevance (Gelman & Gallistel, 1978; Hannula-Sormunen et al., 2015). These principles allow children to connect number words with quantities and to understand that the last number word used in a count indicates the cardinal value of a set. Accordingly, early numeracy is better understood as a multi-component construct that includes comparison, classification, matching, seriation, counting, resultative counting, general number knowledge, and estimation (Aunio & Räsänen, 2016; Purpura & Lonigan, 2013; Van de Walle et al., 2018).

From a developmental perspective, early numeracy requires children to move between concrete objects, spoken number words, and abstract quantitative relations. A child who counts a group of objects must understand that each object is counted once, that number words follow a conventional order, and that the final word represents the size of the whole set. This coordination of symbols and quantities is cognitively demanding because it requires children to hold multiple representations in mind at the same time. For this reason, early number and counting skills provide a suitable context for examining representational development in the preschool years (Geary & vanMarle, 2016; Howell & Kemp, 2010; Salminen et al., 2018).

Children's early mathematics performance is shaped by both contextual and individual factors. Home learning support and the home mathematics environment are associated with mathematical development (Zhao & Gibson, 2023), while classroom experiences can provide systematic opportunities for numerical reasoning. At the child level, age, language, working memory, and executive functions have been linked to early mathematics outcomes (De Smedt et al., 2009; ten Braak et al., 2022; Vukovic & Lesaux, 2013). These findings suggest that early numerical development should be examined in relation to broader cognitive and social-cognitive processes rather than as an isolated academic skill.

The present focus on counting skills is therefore not a narrow focus on rote performance. Counting is an entry point into children's broader mathematical reasoning because it allows children to compare sets, determine quantity, monitor change, and construct relations among objects. When children understand that number words can stand for quantities, they begin to use symbols to organize experience. This symbolic function is developmentally relevant to the present study because theory of mind also depends on children's ability to understand that internal representations may stand for events, objects, or situations in the world.

Theory of mind refers to children's ability to understand that people have mental states such as beliefs, desires, intentions, and emotions, and that these mental states may differ from reality or from one's own perspective (Gopnik & Wellman, 1992; Wellman & Liu, 2004). During the preschool years, children gradually become more successful in false-belief tasks and in understanding that others may act on the basis of mistaken beliefs (Hughes, 2011). Language development, executive functioning, effortful control, and social experiences are among the factors associated with this developmental progression (Aubuchon et al., 2023; Devine & Hughes, 2014; Grazzani et al., 2018).

The possible association between early numeracy and theory of mind is theoretically meaningful because both domains require children to understand that one reality can be represented in different ways. In numerical tasks, a set of five objects can be represented through counting, matching,

comparing, or a written numeral. In false-belief tasks, the same event can be represented differently by the child, by a character who has correct knowledge, and by a character who has an inaccurate belief. This shared demand for coordinating alternative representations suggests that the relationship between counting and theory of mind should be examined empirically rather than assumed to be separate developmental pathways (Perner et al., 2021; Wellman & Liu, 2004).

A growing body of research indicates that theory of mind and early academic skills may be developmentally related. Preschool false-belief understanding has been found to predict later mathematics achievement (Devine & Hughes, 2014; Lockl et al., 2017), and longitudinal findings suggest that theory of mind and executive function can contribute to mathematics and reading abilities over time (Kloo et al., 2022). One explanation for this association is that both early numeracy and theory of mind require representational flexibility: in counting, children coordinate quantities, number words, and objects; in theory of mind, they coordinate reality with another person's belief representation (Perner et al., 2021; Sarnecka & Wright, 2013). Despite this conceptual overlap, empirical evidence from Turkish preschool samples remains limited. Therefore, the present study focuses on the relationship between early numeracy and theory of mind in children aged 48–72 months.

1.1. The Current Study

The purpose of this study was to examine age- and gender-related differences in early numeracy and theory of mind scores and to determine the associations between these two developmental domains in preschool children. The study was conducted with children aged 48–72 months because this period is developmentally important for both counting principles and false-belief understanding. By examining these variables together, the study aims to contribute to a more integrated understanding of children's quantitative and social-cognitive development.

The study is also important because the preschool years are characterized by rapid changes in both numerical and social-cognitive reasoning. Children in the 48–60-month age range may be consolidating basic counting principles and first-order false-belief understanding, whereas children in the 61–72-month age range may be more prepared for complex counting and second-order belief tasks. Examining these two age groups together may therefore reveal whether the two domains show similar developmental patterns or whether some tasks differentiate children more strongly than others.

The study was guided by the following research questions:

- (1) Do early numeracy skills differ according to children's age group and gender?
- (2) Do theory of mind task scores differ according to children's age group and gender?
- (3) What is the relationship between children's early numeracy skills and theory of mind task scores?

2. Method

2.1. Research Design

This study employed a cross-sectional correlational design. This design was considered appropriate because the study aimed to examine age- and gender-related differences in early numeracy and theory of mind scores and to determine the associations between these developmental domains at a single point in time. No intervention was implemented, and no causal inference was intended (Cohen et al., 2007; Wang & Cheng, 2020).

2.2. Participants

The participants were 102 children aged 48–72 months who were attending preschool education during the 2023–2024 academic year in six independent preschools located in the İzmit, Başiskele, and Gölcük districts of Kocaeli, Türkiye. The sample included 48 girls and 54 boys. Participants were selected through convenience sampling based on accessibility, school permission, parental consent, and children's willingness to participate. Inclusion criteria were being between 48 and 72 months of age, attending an independent preschool, and having written parental consent. Children who were unwilling, distracted, or uncomfortable during the individual session were not forced to continue.

Table 1 *Demographic characteristics of the participants*

Characteristic	<i>f</i>	%
Age group		
48–60 months	49	48.0
61–72 months	53	52.0
Total	102	100.0
Gender		
Girls	48	47.1
Boys	54	52.9
Total	102	100.0

As Table 1 shows, 49 children (48%) were in the 48–60-month group and 53 (52%) were in the 61–72-month group, with 48 girls (47.1%) and 54 boys (52.9%).

2.3. Data Collection Instruments

Data were collected using a participant information form, the Early Numeracy Test, and four theory of mind tasks: Sally-Anne, Bonibon, Chocolate Bar, and Ice Cream Truck. The participant information form included items on children's gender, age group, parental education, and family income.

The Early Numeracy Test was developed by van Luit et al. (1994) and adapted into Turkish by Önkol (2012). The test is suitable for preschool and first-grade children and assesses early mathematical proficiency and early number knowledge. It includes nine subdimensions: comparison, classification, matching, seriation, counting, structural counting, resultative counting, general number knowledge, and estimation. Each correct response is scored as 1, and each incorrect response is scored as 0. In the Turkish adaptation study, the test-retest correlation was .84 for Form A, Cronbach's alpha was .94, and the Kuder-Richardson 20 reliability coefficient was .91 (Önkol, 2012).

The use of a multidimensional early numeracy measure was important for this study because the research question did not focus on counting accuracy alone. The Early Numeracy Test makes it possible to examine whether theory of mind is associated only with counting-related subdimensions or whether the relationship extends to broader numerical skills such as classification, seriation,

general number knowledge, and estimation. This structure allowed the study to identify differentiated patterns rather than relying solely on a single total mathematics score.

Theory of mind was assessed using four tasks adapted by Girli and Tekin (2010). The Sally-Anne task assesses first-order false-belief understanding through a location-change scenario originally developed by Baron-Cohen et al. (1985). The Bonibon task assesses unexpected-content false belief. The Chocolate Bar task involves a belief scenario in which one character observes a transfer of an object while another character's belief is inferred. The Ice Cream Truck task, originally developed as a second-order false-belief task by Perner and Wimmer (1985), requires children to understand what one character thinks about another character's belief. In the Turkish adaptation study, KR-21 reliability values were reported as .78 for the Sally-Anne task, .82 for the Bonibon task, .84 for the Chocolate Bar task, and .84 for the Ice Cream Truck task; the KR-21 value for the overall task set was .83 (Girli & Tekin, 2010).

2.4. Data Collection Process

After the required permissions were obtained, information and consent forms were sent to parents. Only children whose parents provided written informed consent were included. Data were collected individually in a quiet room within the preschool setting during the spring term of the 2023–2024 academic year. Before the tasks, the researcher engaged in brief rapport-building activities. The measurement instruments were administered one-to-one in approximately 30 minutes per child. Children were seated opposite the researcher at a table, and the tasks were administered in a child-appropriate manner. No audio recording, video recording, or photographs were used.

2.5. Data Analysis

The data were analyzed using a statistical package program. Normality was examined using Kolmogorov-Smirnov and Shapiro-Wilk tests because the sample size and score distributions required careful assessment of distributional assumptions (Razali & Wah, 2011). Because the variables did not meet the normality assumption, nonparametric analyses were conducted. Mann-Whitney U tests were used for two-group comparisons by age group and gender. Spearman's rho correlation coefficients were calculated to examine the associations between early numeracy scores and theory of mind task scores. For Mann-Whitney U tests, effect sizes were calculated using $r = |z| / \sqrt{N}$ and interpreted as small around .10, medium around .30, and large around .50 (Field, 2013). The significance level was set at $p < .05$.

Table 2 Results of the normality test of the data

Variable	Age group	Kolmogorov–Smirnov			Shapiro–Wilk		
		Statistic	df	p	Statistic	df	p
Comparison	48–60 months	.390	49	< .001	.674	49	< .001
	61–72 months	.485	53	< .001	.460	53	< .001
Classification	48–60 months	.207	49	< .001	.880	49	< .001
	61–72 months	.340	53	< .001	.780	53	< .001
Matching	48–60 months	.219	49	< .001	.854	49	< .001

Variable	Age group	Kolmogorov–Smirnov			Shapiro–Wilk		
		Statistic	df	p	Statistic	df	p
Seriation	61–72 months	.200	53	< .001	.856	53	< .001
	48–60 months	.252	49	< .001	.885	49	< .001
	61–72 months	.159	53	.002**	.885	53	< .001
Counting	48–60 months	.214	49	< .001	.926	49	< .001
	61–72 months	.175	53	< .001	.882	53	< .001
Structural counting	48–60 months	.213	49	< .001	.888	49	< .001
	61–72 months	.210	53	< .001	.856	53	< .001
Resultative counting	48–60 months	.147	49	.010*	.924	49	.004**
	61–72 months	.217	53	< .001	.847	53	< .001
General number knowledge	48–60 months	.191	49	< .001	.910	49	.001**
	61–72 months	.165	53	< .001	.895	53	< .001
Estimation	48–60 months	.298	49	< .001	.796	49	< .001
	61–72 months	.379	53	< .001	.711	53	< .001
Sally-Anne task	48–60 months	.323	49	< .001	.763	49	< .001
	61–72 months	.341	53	< .001	.729	53	< .001
Bonibon task	48–60 months	.445	49	< .001	.557	49	< .001
	61–72 months	.463	53	< .001	.505	53	< .001
Chocolate Bar task	48–60 months	.235	49	< .001	.810	49	< .001
	61–72 months	.253	53	< .001	.802	53	< .001
Ice Cream Truck task	48–60 months	.289	49	< .001	.757	49	< .001
	61–72 months	.246	53	< .001	.809	53	< .001

Note. *p < .05. **p < .01.

2.6. Ethical Considerations

This study was conducted in accordance with international ethical principles for research involving human participants (e.g., the Declaration of Helsinki) and received ethics committee approval on 09 April 2023 (approval number: 2023/164). Permission was also obtained from the Provincial Directorate of National Education. Written informed consent was obtained from the parents or legal

guardians of all participating children before data collection. Children's willingness was monitored during each session, and children who did not wish to continue were not forced to participate.

3. Findings

The findings are presented in three parts. First, age- and gender-related differences in early numeracy scores are reported. Second, age- and gender-related differences in theory of mind task scores are presented. Third, the relationships between early numeracy dimensions and theory of mind task scores are reported.

3.1. Age and Gender Differences in Early Numeracy

Table 3 *Early numeracy test scores by age group*

Early Numeracy Test	Age group	N	MR	SR	U	z	p
Comparison	48–60 months	49	46.61	2284.00	1059.00	2.101	.036*
	61–72 months	53	56.02	2969.00			
	Total	102					
Classification	48–60 months	49	44.28	2169.50	944.50	-2.510	.012*
	61–72 months	53	58.18	3083.50			
	Total	102					
Matching	48–60 months	49	50.54	2476.50	1251.50	-0.333	.739
	61–72 months	53	52.39	2776.50			
	Total	102					
Seriation	48–60 months	49	50.51	2475.00	1250.00	-0.333	.739
	61–72 months	53	52.42	2778.00			
	Total	102					
Counting	48–60 months	49	46.81	2293.50	1068.50	-1.576	.115
	61–72 months	53	55.84	2959.50			
	Total	102					
Structural counting	48–60 months	49	47.24	2315.00	1090.00	-1.423	.155
	61–72 months	53	55.43	2938.00			
	Total	102					
Resultative counting	48–60 months	49	39.83	1951.50	726.50	-3.904	< .001

Early Numeracy Test	Age group	N	MR	SR	U	z	p
	61–72 months	53	62.29	3301.50			
	Total	102					
	48–60 months	49	44.62	2186.50	961.50	-2.306	.021*
General number knowledge	61–72 months	53	57.86	3066.50			
	Total	102					
	48–60 months	49	50.02	2451.00	1226.00	-0.551	.582
Estimation	61–72 months	53	52.87	2802.00			
	Total	102					
	48–60 months	49	43.98	2155.00	930.00	-2.471	.013*
ENT total	61–72 months	53	58.45	3098.00			
	Total	102					

Note. MR = mean rank; SR = sum of ranks. * $p < .05$. ** $p < .01$.

As shown in Table 3, the Mann-Whitney U test indicated significant age-group differences in comparison, classification, resultative counting, general number knowledge, and total early numeracy scores. In all significant comparisons, the mean ranks favored children aged 61–72 months. The effect sizes were small for comparison ($r = .21$), classification ($r = .25$), general number knowledge ($r = .23$), and total early numeracy ($r = .24$), and moderate for resultative counting ($r = .39$). No significant age-group differences were found for matching, seriation, counting, structural counting, or estimation.

Table 4 Early numeracy test scores by gender

Early Numeracy Test	Gender	N	MR	SR	U	z	p
Comparison	Girls	48	50.86	2441.50	1265.50	-0.268	.789
	Boys	54	52.06	2811.50			
	Total	102					
Classification	Girls	48	59.53	2857.50	910.50	-2.736	.006**
	Boys	54	44.36	2395.50			
	Total	102					
Matching	Girls	48	53.16	2551.50	1216.50	-0.551	.581
	Boys	54	50.03	2701.50			

Early Numeracy Test	Gender	N	MR	SR	U	z	p
	Total	102					
	Girls	48	52.77	2533.00	1235.00	-0.419	.675
	Boys	54	50.37	2720.00			
Seriation	Total	102					
	Girls	48	54.58	2620.00	1148.00	-1.015	.310
	Boys	54	48.76	2633.00			
Counting	Total	102					
	Girls	48	54.68	2624.50	1143.50	-1.042	.297
	Boys	54	48.68	2628.50			
Structural counting	Total	102					
	Girls	48	53.53	2569.50	1198.50	-0.666	.505
	Boys	54	49.69	2683.50			
Resultative counting	Total	102					
	Girls	48	55.68	2672.50	1095.50	-1.373	.170
	Boys	54	47.79	2580.50			
General number knowledge	Total	102					
	Girls	48	52.00	2496.00	1272.00	-0.182	.855
	Boys	54	51.06	2757.00			
Estimation	Total	102					
	Girls	48	55.64	2670.50	1097.50	-1.332	.183
	Boys	54	47.82	2582.50			
ENT total	Total	102					

Note. MR = mean rank; SR = sum of ranks. * $p < .05$. ** $p < .01$.

As shown in Table 4, no statistically significant gender differences were found in the early numeracy subdimensions or total score, except for classification. Girls had significantly higher classification scores than boys, $U = 910.50$, $z = -2.74$, $p = .006$, $r = .27$. The effect size indicated a small-to-moderate difference.

3.2. Age and Gender Differences in Theory of Mind

Table 5 *Theory of mind scores by age group*

ToM task	Age group	N	MR	SR	U	z	p
Sally-Anne	48–60 months	49	51.33	2515.00	1290.00	-0.063	.950
	61–72 months	53	51.66	2738.00			
	Total	102					
Bonibon	48–60 months	49	50.33	2466.00	1241.00	-0.527	.598
	61–72 months	53	52.58	2787.00			
	Total	102					
Chocolate Bar	48–60 months	49	48.93	2397.50	1172.50	-0.914	.361
	61–72 months	53	53.88	2855.50			
	Total	102					
Ice Cream Truck	48–60 months	49	43.88	2150.00	925.00	-2.724	.006**
	61–72 months	53	58.55	3103.00			
	Total	102					

Note. MR = mean rank; SR = sum of ranks. * $p < .05$. ** $p < .01$.

As shown in Table 5, no significant age-group differences were found in the Sally-Anne, Bonibon, or Chocolate Bar tasks. A significant age-group difference was found only for the Ice Cream Truck task, $U = 925.00$, $z = -2.72$, $p = .006$, $r = .27$, with mean ranks favoring the 61–72-month group.

Table 6 *Theory of mind scores by gender*

ToM task	Gender	N	MR	SR	U	z	p
Sally-Anne	Girls	48	55.58	2668.00	1100.00	-1.453	.146
	Boys	54	47.87	2585.00			
	Total	102					
Bonibon	Girls	48	52.17	2504.00	1264.00	-0.294	.769
	Boys	54	50.91	2749.00			
	Total	102					
Chocolate Bar	Girls	48	56.14	2694.50	1073.50	-1.616	.106
	Boys	54	47.38	2558.50			
	Total	102					

ToM task	Gender	N	MR	SR	U	z	p
	Total	102					
	Girls	48	55.43	2660.50	1107.50	-1.376	.169
Ice Cream Truck	Boys	54	48.01	2592.50			
	Total	102					

Note. MR = mean rank; SR = sum of ranks.

As shown in Table 6, no statistically significant gender differences were found in any of the four theory of mind task scores.

Table 7 Relationships between ToM and ENT scores

ENT dimension		Sally-Anne	Bonibon	Chocolate Bar	Ice Cream Truck
Comparison	<i>r</i>	.027	.086	.033	-.042
	<i>p</i>	.788	.393	.741	.673
	<i>N</i>	102	102	102	102
Classification	<i>r</i>	.203*	.224*	.235*	.012
	<i>p</i>	.040	.024	.018	.906
	<i>N</i>	102	102	102	102
Matching	<i>r</i>	.140	.160	.225*	.007
	<i>p</i>	.161	.108	.023	.945
	<i>N</i>	102	102	102	102
Seriation	<i>r</i>	.303**	.168	.231*	-.044
	<i>p</i>	.002	.091	.020	.661
	<i>N</i>	102	102	102	102
Counting	<i>r</i>	.256**	.313**	.501**	.138
	<i>p</i>	.010	.001	< .001	.165
	<i>N</i>	102	102	102	102
Structural counting	<i>r</i>	.154	.226*	.349**	.042
	<i>p</i>	.122	.023	< .001	.678
	<i>N</i>	102	102	102	102

ENT dimension		Sally-Anne	Bonibon	Chocolate Bar	Ice Cream Truck
Resultative counting	<i>r</i>	.164	.312**	.379**	.165
	<i>p</i>	.099	.001	< .001	.098
	<i>N</i>	102	102	102	102
General number knowledge	<i>r</i>	.322**	.488**	.465**	-.024
	<i>p</i>	.001	< .001	< .001	.812
	<i>N</i>	102	102	102	102
Estimation	<i>r</i>	.021	-.012	.013	.066
	<i>p</i>	.830	.903	.895	.511
	<i>N</i>	102	102	102	102
ENT total	<i>r</i>	.289**	.340**	.448**	.059
	<i>p</i>	.003	< .001	< .001	.553
	<i>N</i>	102	102	102	102

Note. ToM = theory of mind; ENT = Early Numeracy Test. * $p < .05$. ** $p < .01$.

As shown in Table 7, positive and significant correlations were observed between several early numeracy dimensions and the Sally-Anne, Bonibon, and Chocolate Bar tasks. Sally-Anne was positively associated with classification, seriation, counting, general number knowledge, and total early numeracy. Bonibon was positively associated with classification, counting, structural counting, resultative counting, general number knowledge, and total early numeracy. Chocolate Bar showed the strongest and most consistent pattern, correlating positively with all early numeracy subdimensions except comparison and estimation, as well as with total early numeracy. The Ice Cream Truck task was not significantly correlated with any early numeracy subdimension or with total early numeracy.

4. Discussion

This study examined age- and gender-related differences in early numeracy and theory of mind and investigated the relationships between these two developmental domains in children aged 48–72 months. The findings showed that older children performed better than younger children in several early numeracy dimensions and in the Ice Cream Truck task. Gender differences were limited. Most importantly, several early numeracy dimensions were positively associated with first-order theory of mind tasks, whereas the second-order Ice Cream Truck task stood outside this pattern.

The finding that children aged 61–72 months scored higher on comparison, classification, resultative counting, general number knowledge, and total early numeracy is consistent with developmental accounts of early mathematics. As children grow older, they have more opportunities to engage in numerical activities, use number words, compare quantities, and coordinate symbolic and nonsymbolic representations (Aunio & Räsänen, 2016; Nguyen et al., 2016). The moderate effect

observed for resultative counting is especially meaningful because this skill requires children not only to count but also to understand the cardinal meaning of the final number word, a principle that is central to meaningful counting (Gelman & Gallistel, 1978; Sarnecka & Wright, 2013).

The age-related findings should also be interpreted in relation to children's accumulated learning opportunities. Older preschool children may have had more sustained exposure to counting routines, classroom materials, number games, peer interaction, and adult-guided mathematical language. These experiences can support children's ability to compare quantities, classify objects according to relevant attributes, and use number knowledge flexibly. Therefore, the observed age differences may reflect both maturation and cumulative educational experience. Because the study did not measure preschool attendance duration or classroom mathematics quality, this explanation should be treated as a theoretically plausible interpretation rather than a directly tested conclusion.

Not all early numeracy dimensions differed by age group. Matching, seriation, counting, structural counting, and estimation did not show significant age-related differences. This pattern may indicate that some tasks assessed skills that were already accessible to both age groups or that had been frequently practiced in preschool settings. It may also reflect variability in the difficulty level of the subtests. Estimation, for example, may require more advanced number-line reasoning and representational precision than simple counting or matching tasks (Booth & Siegler, 2006; Siegler & Booth, 2004). Future studies with item-level analyses may clarify whether particular tasks are too easy, too difficult, or insufficiently sensitive for specific age ranges.

Gender differences in early numeracy were minimal. The only significant difference was observed in classification, where girls had higher mean ranks than boys. This finding should be interpreted cautiously because no gender difference emerged in total early numeracy or in the other subdimensions. The broader literature generally suggests that girls and boys do not differ intrinsically in early numerical abilities (Aunio et al., 2004; Kersey et al., 2018). Therefore, the classification difference in this sample may reflect group-specific experiences, task characteristics, or unmeasured variables rather than a stable gender-based difference.

The absence of broad gender differences is also practically important. In early childhood classrooms, assumptions about gender-based mathematical capacity may influence teachers' expectations, the kinds of tasks offered to children, and the feedback children receive. The present findings do not support such assumptions. Instead, they suggest that both girls and boys should be offered rich, challenging, and equally encouraging opportunities to engage in counting, classification, comparison, and explanation. The isolated classification difference should therefore be considered a finding that requires further examination rather than a basis for differentiated expectations.

In theory of mind, age-related differences emerged only for the Ice Cream Truck task. This result is theoretically plausible because the Ice Cream Truck task is a second-order false-belief task and requires children to understand what one character thinks about another character's belief (Perner & Wimmer, 1985). It involves a longer narrative sequence, greater working-memory demands, and more complex linguistic processing than first-order false-belief tasks. The absence of age differences in the Sally-Anne, Bonibon, and Chocolate Bar tasks may indicate that many children in both age groups had already reached a basic level of first-order false-belief understanding. Similar developmental patterns have been discussed in research showing that theory of mind performance varies according to task type and linguistic complexity (Rai & Mitchell, 2004; Wellman & Liu, 2004).

The findings also highlight the importance of considering task difficulty. Tasks that appear to assess the same broad domain may differ substantially in their cognitive and linguistic demands. For

example, a child may succeed in a simple location-change false-belief task but struggle when the task requires tracking multiple characters, a changing location, and a second-order belief. Similarly, a child may recite number words accurately but experience difficulty when asked to use counting to determine a result or to make a numerical judgment. This variability suggests that future studies should examine not only total scores but also the structure and difficulty of individual subdimensions and tasks.

Gender did not significantly affect theory of mind task scores. This result differs from some studies reporting girls' advantages in theory of mind performance (Calero et al., 2013; Sundqvist et al., 2018). However, gender effects in theory of mind are not always consistent across cultural contexts, task formats, and age ranges. Cultural and linguistic experiences may shape children's opportunities to talk about mental states and to practice perspective-taking (Shahaeian et al., 2011). Therefore, the absence of gender differences in the present sample should be interpreted as evidence of comparable performance within this particular group rather than as a universal developmental pattern.

The central finding of the study was the positive relationship between several early numeracy dimensions and three of the four theory of mind tasks. This result is consistent with studies suggesting developmental links between false-belief understanding, executive function, and academic skills (Cantin et al., 2016; Devine & Hughes, 2014; Kloo et al., 2022; Lecce & Devine, 2022; Lockl et al., 2017). One possible explanation is that both early numeracy and theory of mind require representational flexibility. In early numeracy, children must understand that number words can represent quantities and that the same set can be described through different numerical relations. In theory of mind, children must understand that beliefs can represent reality accurately or inaccurately. Thus, children's ability to coordinate different representations may support performance in both domains (Perner et al., 2021; Sarnecka & Wright, 2013).

Another issue concerns the potential role of unmeasured shared variables. Language development may support both domains because children need to understand task instructions, relational expressions, mental-state verbs, and quantitative language. Working memory may also contribute because children must remember the sequence of events in theory of mind stories and maintain counting information during numerical tasks. Executive functions may help children inhibit their own knowledge of reality in false-belief tasks and suppress irrelevant strategies in numerical tasks. Since these variables were not directly assessed, the correlations reported in this study should be interpreted as associations rather than evidence of a direct developmental pathway.

The lack of significant correlations between the Ice Cream Truck task and early numeracy dimensions deserves particular attention. Rather than contradicting the general relationship between early numeracy and theory of mind, this finding may indicate that the Ice Cream Truck task measured a more advanced and linguistically demanding aspect of theory of mind. Second-order false-belief tasks may require narrative comprehension, memory for multiple characters' knowledge states, and the integration of nested mental representations. These demands may have reduced the task's sensitivity to the early numeracy skills measured in this study. Future research should include language, working memory, and executive function measures to clarify whether these variables explain the association between theory of mind and early numeracy.

4.1. Limitations

This study has several limitations. First, the cross-sectional correlational design does not allow causal conclusions about the developmental direction of the relationship between early numeracy

and theory of mind. Second, the sample was limited to 102 children attending six independent preschools in one province, which restricts the generalizability of the findings. Third, variables known to influence both early numeracy and theory of mind, such as language development, working memory, executive functions, effortful control, preschool attendance duration, and socioeconomic status, were not included in the analysis. Fourth, the Ice Cream Truck task may have imposed higher linguistic and narrative demands than the other tasks, which may have affected children's performance independently of their theory of mind competence.

A further limitation is that the study did not include descriptive variables such as duration of preschool attendance, classroom mathematics exposure, or children's language scores. These variables may help explain why some early numeracy dimensions and some theory of mind tasks were associated while others were not. Moreover, because the analyses were based on nonparametric group comparisons and bivariate correlations, the findings do not show whether the observed associations remain significant after controlling for age or other developmental variables.

4.2. Implications and Recommendations

The findings suggest that early childhood education practices may benefit from integrated activities that support numerical reasoning and social-cognitive representation together. Activities that ask children to count, compare, classify, predict another person's action, explain a character's mistaken belief, or discuss alternative perspectives may provide opportunities to strengthen both quantitative thinking and perspective-taking. Teachers can design play-based and story-based tasks in which children solve numerical problems while also reasoning about what different characters know, think, or expect.

For classroom practice, the findings point to the value of designing activities that naturally combine mathematical and social-cognitive talk. For instance, teachers may use story-based problems in which a character miscounts objects, hides a set of materials, or makes an incorrect prediction about quantity. Children can then be asked not only how many objects there are but also what the character thinks, why the character is mistaken, and how the character could solve the problem. Such activities may help children connect counting, explanation, justification, and perspective-taking within meaningful play contexts.

Future studies should use larger and more diverse samples and should include measures of language development, executive functions, working memory, and socioeconomic characteristics. Longitudinal studies are needed to determine whether theory of mind predicts later early numeracy, whether early numeracy contributes to social-cognitive development, or whether both are explained by shared underlying cognitive mechanisms. Intervention studies may also examine whether integrated activities improve both counting skills and theory of mind performance.

Policy and program-level implications should also be considered cautiously. The study does not provide evidence for a specific intervention model, but it supports the idea that preschool programs should avoid treating cognitive, mathematical, and social-emotional domains as disconnected areas. Developmentally appropriate early childhood curricula can create integrated learning experiences in which children count, compare, explain, negotiate, predict, and reason about others' perspectives. Such integration may be especially valuable in classrooms where children's language, symbolic thinking, and peer interaction are developing simultaneously.

5. Conclusion

This study showed that early numeracy and theory of mind are related developmental domains in the preschool period. Older children performed better in selected early numeracy dimensions and in the second-order theory of mind task, while gender differences were minimal. Significant positive associations between early numeracy and first-order theory of mind tasks suggest that quantitative thinking and social-cognitive representation may develop in partially connected ways. The findings support the value of holistic early childhood practices that address children's numerical reasoning, symbolic thinking, and perspective-taking together.

6. Declarations

6.1. Conflict of interest

The authors declare that they have no conflict of interest to disclose.

6.2. Funding

This research received no specific funding.

6.3. Author contributions (CRediT)

Furkan Albayrak: Conceptualization; Methodology; Formal analysis; Investigation; Writing—original draft; Writing—review & editing

Türker Sezer: Conceptualization; Methodology; Writing—review & editing; Supervision

6.4. Data availability statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

6.5. Ethics approval

This study was conducted in accordance with international ethical principles for research involving human participants (e.g., the Declaration of Helsinki) and received ethics committee approval on 09 April 2023 (approval number: 2023/164). Permission was also obtained from the Provincial Directorate of National Education. Written informed consent was obtained from the parents or legal guardians of all participating children.

6.6. Use of artificial intelligence (AI) tools

Generative AI tools (ChatGPT, GPT-5.5, OpenAI) were used to support manuscript drafting, literature review organization, and Turkish–English language editing. The authors reviewed, verified, and approved all AI-assisted content. Generative AI tools were not used for data collection, data analysis, interpretation of findings, or authorship.

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The architecture of not-seeing: Theorizing epistemic blindness as a structural feature of credentialist education

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ABSTRACT

Despite decades of equity and inclusion reform, educational systems continue to reproduce epistemological hierarchies that marginalize non-dominant knowledges and erode learner agency in patterned, predictable ways. This paper argues that existing theoretical frameworks — hidden curriculum, epistemic injustice, and epistemologies of ignorance — illuminate important dimensions of this problem but do not fully account for its most consequential feature: the simultaneous production of epistemic invisibility for marginalized learners and the structural inability to perceive that invisibility in dominant-group learners. This paper introduces the concept of the architecture of not-seeing to name and theorize this condition. The architecture of not-seeing refers to the interlocking curricular, pedagogical, and assessment infrastructures through which credentialist education systems simultaneously erase the epistemic agency of marginalized learners and foreclose the perceptual capacity of dominant-group learners, producing both the unseen and the non-seer through the same mechanisms, while naturalizing both effects as the ordinary, neutral functioning of education. The paper traces three constitutive mechanisms — abstraction from lived context, decontextualized standards of legitimacy, and institutional recognition as proxy for knowing — and shows how these mechanisms produce differential epistemic effects while remaining invisible as mechanisms. It then explains why reform efforts so frequently reproduce the architecture's logic: because the architecture produces the very actors tasked with reforming it. The paper concludes by considering what the concept makes possible for curriculum design, pedagogical practice, and democratic education, positioning epistemic visibility as a foundational educational aim rather than a supplementary one.

KEYWORDS: Architecture of not-seeing; Epistemic injustice; Epistemologies of ignorance; Credentialism; Epistemic visibility

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1. Introduction: The Problem that Has No Name

On two occasions in Northwest British Columbia, I had the opportunity to work relationally and collaboratively, and partially outside the Western institutional frameworks within which contemporary educational systems routinely operate, with Indigenous Nations to co-design multi-year education strategies rooted in each Nation's own priorities, relationships, and vision for its members. The first Nation sought a five-year education strategy spanning human services, cultural

continuity, and industry preparation. The second sought to co-construct an applied coastal ecology program for its Guardians, community members entrusted with the stewardship of the Nation's environment, food systems, and intergenerational relationships to the land. In both cases, what the Nations were building was, by any meaningful definition, education: purposeful, community-accountable, place-grounded, and oriented toward the flourishing of people and land across time.

Neither initiative found its way through the institutional architecture intact.

The constraints were not hostile. No one said no. No policy explicitly prohibited what these Nations were proposing. The funding agency for Indigenous education was not indifferent to Indigenous learners. The college was not unwilling. What happened instead was quieter and, on reflection, more instructive: the architecture of provincial funding cycles (e.g., annual applications, single-fiscal-year delivery windows, compressed approval-to-reporting timelines, standardized delivery assumptions) had no category for a five-year education strategy. A program designed to be delivered within the relational and geographical realities of a coastal Indigenous community could not be processed by systems built for standardized institutional delivery. The proposals were not evaluated and rejected. They were, in a more fundamental sense, structurally unreadable.

This is not an anecdote about bureaucratic inefficiency. It is an illustration of something more consequential: the systems were functioning correctly. They were doing exactly what they were designed to do. The problem was not malfunction but design — a design that determined, before any proposal arrived, what forms of educational knowledge could be seen, evaluated, and resourced, and what forms could not.

This pattern is not confined to Indigenous education policy, nor to northern communities, nor to Canada. It is visible wherever educational systems encounter knowledges that are oral rather than text-based, collective rather than individually authored, place-specific rather than universally transferable, or transmitted through relationship and practice rather than credentialed instruction. The pattern is consistent: such knowledges do not fail evaluation. They fail to reach it. The architecture has already rendered them illegible before any judgment is made.

Educational scholarship has named many dimensions of this problem. The hidden curriculum literature has illuminated how schools transmit unstated norms, values, and hierarchies alongside their explicit content (Apple, 2004; Freire, 1970/2000; Giroux & Penna, 1979; Jackson, 1968). Epistemic injustice scholarship has traced how marginalized knowers are systematically discredited or denied the interpretive resources to make sense of their own experience (Dotson, 2011; Fricker, 2007; Medina, 2013). Epistemologies of ignorance have shown how not-knowing is actively produced and maintained, particularly among dominant groups (Mills, 1997, 2007; Proctor & Schiebinger, 2008; Tuana, 2006). Each of these frameworks has contributed something essential. None of them, as this paper argues, fully accounts for what the examples above reveal: a condition in which the same educational mechanisms simultaneously produce invisibility for some knowers and the structural inability to perceive that invisibility in others, and sustain both effects under the appearance of ordinary, neutral institutional functioning.

There is, as yet, no established theoretical term for this condition. That absence is itself part of what this paper seeks to address. Stated plainly, the problem is a theoretical one. Existing frameworks explain how educational systems discredit some knowers and how dominant groups come not to know, but none accounts for a single educational infrastructure that produces both effects at once while presenting itself as neutral. The question guiding this paper follows: what do hidden curriculum

theory, epistemic injustice, and epistemologies of ignorance leave unexplained about this condition, and what concept would account for it?

A word about position. This paper argues that credentialist educational systems produce structural blindness, and it is written by someone who holds two degrees from Western-accredited institutions and has spent a career operating within, and benefiting from, the very architecture under critique. Khatibi's (1983) double critique (i.e., the imperative to think rigorously against one's own formation, to hold inherited frameworks under the same critical pressure one applies to others) names this condition honestly. This paper does not claim to stand outside the architecture it theorizes. It claims only to look at it steadily, from inside, and to describe what becomes visible when one does.

The sections that follow attempt precisely that. They do not begin by naming the concept this paper introduces. They begin where the argument requires: with the frameworks that already exist, what each one sees, and crucially, what each one leaves unexplained.

1.1. Approach and Scope

This is a conceptual paper; it reports no empirical research. Its method is theory-building through conceptual analysis, combining two of the approaches Jaakkola (2020) identifies for conceptual articles: theory synthesis, in which existing frameworks are examined and integrated to reveal what none accounts for alone, and the model approach, in which a new construct is specified through its mechanisms and effects. Section 2 examines three adjacent frameworks for what each explains and what each leaves unexplained, Table 1 consolidates their contributions and limits, and Sections 3 and 4 specify the proposed construct, its three mechanisms, and the dual production they achieve. As Ruitenberg (2009) observes, philosophical work in education has methods of its own, even where they are not codified as procedures in the way empirical methods are. The claims made here are accordingly claims of explanatory adequacy, concerning what the concept allows researchers and practitioners to see and to ask, rather than claims of empirical generalization. Section 5.4 names what this approach does not establish.

The two Northwest British Columbia examples serve as illustrations, not as data. They are drawn from my own professional practice in post-secondary education and describe how the institutional architecture received two initiatives I worked on, as I experienced it from within that architecture. They do not describe the Nations' knowledge, deliberations, or internal processes, and no community knowledge or materials are reproduced. Neither Nation is named, and both initiatives are described in terms general enough to limit identification. This paper was not undertaken with or on behalf of either Nation and does not speak for them. The account is of the architecture as I encountered it from inside, which is the vantage point this paper claims throughout.

2. What We Already Have and What It Leaves Unexplained

The problem described in the preceding section is not invisible to educational scholarship. Researchers and theorists have been circling it, from different directions and with different instruments, for decades. The question this section asks is not whether existing frameworks illuminate the problem — they do — but whether any of them, singly or in combination, fully accounts for what those Northwest British Columbia examples revealed: a structural condition that produces epistemic invisibility while simultaneously producing the inability to perceive it, and sustains both effects as the ordinary, unremarkable functioning of educational systems. That is a specific theoretical claim, and it requires a specific theoretical tool.

2.1. Hidden Curriculum

The concept of the hidden curriculum, developed by Jackson (1968) and elaborated by Apple (2004), Giroux and Penna (1979), and Margolis et al (2001), remains one of the most generative contributions in curriculum theory. Its central insight, that schools teach far more than their official curricula announce, and that much of what they teach concerns compliance, hierarchy, and the naturalization of dominant social arrangements, opened a critical line of inquiry that continues to inform educational research and practice.

The hidden curriculum framework is particularly powerful in revealing how socialization operates implicitly: how learners absorb norms about authority, competition, and the relationship between obedience and reward without those lessons ever appearing in a syllabus. Freire's (1970/2000) related concept of the banking model of education extended this analysis by showing how pedagogical relationships themselves encode epistemological assumptions, positioning the teacher as the holder of knowledge and the learner as its passive recipient, a relationship that reflects and reproduces broader social hierarchies.

The funding cycle that could not read a five-year Nation-designed education strategy was not shaped by ignorance of that need. It was a system created in a different context, for a different logic, that was never designed to interface with Indigenous educational planning and whose constraints have since been broadly understood, including by funders themselves, yet persist unchanged. This is not hidden curriculum. It is something quieter and more intractable: a kind of silent, artificial harmony, in which the gap between what the system can process and what communities need is acknowledged on all sides and remedied by no one. The dysfunction is visible. The architecture is not.

And yet the hidden curriculum framework reaches a limit here. Its primary analytical register is socialization and ideological transmission. It asks what schools teach implicitly, and traces how dominant cultural norms are reproduced through institutional routines and social relations. What it does not centrally address is the epistemic dimension of this process: not merely what is taught implicitly, but what is rendered structurally imperceptible, and to whom. The hidden curriculum framework attends to what learners absorb without knowing they are absorbing it. It does not fully theorize what learners are structurally prevented from perceiving nor, crucially, the differential nature of that prevention across differently positioned learners. In the Northwest BC examples, what is at stake is not only socialization into dominant norms. It is a structural condition in which certain knowledges cannot be seen as knowledge at all and in which that invisibility is simultaneously invisible to those the system most privileges.

Reproduction theory comes closer still, and its proximity should be acknowledged. Bourdieu and Passeron (1970/1990) argued that pedagogic action imposes a cultural arbitrary whose authority depends on that arbitrariness being misrecognized, and that schooling converts social advantage into what appears as individual merit, so that success feels natural to those whose habitus matches the school's demands and failure feels personal to those whose habitus does not. Much of what this paper calls the dual production is anticipated here. The architecture of not-seeing departs from reproduction theory at the point where knowledge, rather than culture, becomes the object. Bourdieu and Passeron's cultural arbitrary is ranked within a single epistemic order: the dispositions of dominated classes are recognized, and devalued, on the same scale that rewards the dominant class. The knowledges at issue in this paper are not ranked low on that scale. They never enter it. Oral, relational, and place-based knowledges fail not because the architecture values them less but because it cannot read them as knowledge at all, a difference that becomes decisive wherever educational institutions meet knowledge traditions they were not built to recognize.

2.2. Epistemic Injustice

Fricker's (2007) framework of epistemic injustice offered a conceptually precise account of a different dimension of the problem. Where hidden curriculum theory addressed socialization and ideology, epistemic injustice named specific wrongs done to persons in their capacity as knowers. Testimonial injustice occurs when a speaker's credibility is deflated due to identity prejudice; when what someone knows is discounted because of who they are. Hermeneutical injustice occurs when a gap in collective interpretive resources disadvantages someone trying to make sense of their own social experience, because the dominant conceptual vocabulary was built without their participation.

The epistemic injustice framework illuminated something the hidden curriculum literature had not fully named: that marginalized people are not merely socialized differently, but epistemically wronged, that the discounting of their knowledge constitutes a specific form of harm, and that this harm operates through identifiable mechanisms. Dotson's (2011) extension of this framework to include testimonial smothering, the practice of truncating one's own testimony in anticipation of unreceptive audiences, and Medina's (2013) account of epistemic resistance and the epistemology of insurrection deepened and complicated the original framework in important ways.

For the problem at hand, epistemic injustice offers genuine explanatory power. The credentialing mechanism that renders Indigenous and community-held knowledge invisible before evaluation functions, in Fricker's terms, as a structural form of testimonial injustice. The knowledge of uncredentialed knowers is discounted not through individual prejudice alone, but through institutionalized credibility judgments built into funding criteria, accreditation frameworks, and assessment design. This is epistemic injustice operating at the level of architecture rather than interpersonal exchange.

But the framework's limitations for this analysis are also real. Epistemic injustice is primarily theorized at the individual and interpersonal level. It addresses wrongs done to specific persons, remedied through the cultivation of epistemic virtues in individual knowers and hearers. Fricker's proposed remedies (i.e., developing hermeneutical sensitivity, practicing testimonial justice) are oriented toward changing attitudes and practices within existing structures rather than interrogating the structures themselves. More significantly for this analysis, the epistemic injustice framework does not centrally theorize the production of dominant-group positioning. It accounts well for how marginalized knowers are wronged. It does not fully account for how dominant-group knowers are structurally produced as unable to perceive those wrongs, as non-seers rather than merely as uncritical seers. That distinction, as this paper argues, is not incidental. It is where the architectural analysis becomes necessary.

2.3. Epistemologies of Ignorance

The epistemologies of ignorance tradition, developed most influentially by Mills (1997, 2007), Tuana (2006), Sullivan and Tuana (2007), and Proctor and Schiebinger (2008), moved the analytical focus in a direction that addresses this gap more directly. Where epistemic injustice asked how marginalized knowers are wronged, epistemologies of ignorance asked how dominant-group not-knowing is produced, sustained, and made functional. Mills's (1997) racial contract introduced the concept of white ignorance: a structured, motivated, and epistemically productive form of not-knowing that is not incidental to racial dominance but constitutive of it. Tuana's (2006) taxonomy of ignorances, including knowing that one does not know, not knowing that one does not know, and actively produced not-knowing, extended this framework beyond race to a broader account of how ignorance is manufactured and maintained across social hierarchies.

This tradition brings the analysis significantly closer to what the opening section of this paper identified. The administrators and policymakers who cannot see a five-year Indigenous education strategy as legitimate educational planning are not simply uninformed. They have been produced as unable to see it; shaped by educational, professional, and institutional socialization into a form of structured not-knowing that registers as neutral professional judgment. Boler's (1999) concept of the pedagogy of discomfort adds a further dimension. The emotional and psychological investment that dominant-group knowers have in maintaining their comfortable ignorance, and the pedagogical challenge of disrupting it.

Yet even this tradition does not fully close the gap. The epistemologies of ignorance framework addresses the production of not-knowing with precision and power, but it does so primarily at the cognitive, social, and political levels. It does not centre the educational infrastructure (e.g., the specific curricular, pedagogical, and assessment mechanisms) through which this production occurs in institutional practice. It also does not centre credentialism as the operative epistemological mechanism through which ignorance is maintained and legitimized in educational systems specifically. What is needed is a framework that brings the architectural specificity of educational infrastructure together with the insight that ignorance is structurally produced, and that names, precisely, the mechanism through which educational systems simultaneously render certain knowledges invisible and produce the inability to perceive that invisibility in those they most privilege.

The point of departure from this tradition should be stated precisely, because Tuana's (2006) taxonomy comes close to the argument made here. It names a second-order ignorance in which one does not know that one does not know, and it separately names ignorance produced through the construction of epistemically disadvantaged identities. Both effects this paper theorizes therefore appear in her account. Tuana also observes that willful ignorance "often works in tandem with the practice of denying cognitive authority" (p. 14). Even so, the forms of ignorance she identifies remain distinct entries in a taxonomy: practices that can cooperate, rather than a single operation with two effects. Beyond the question of location already noted, the architecture of not-seeing departs from Tuana on two points. First, it claims co-production: the same educational mechanisms, in the same operation, render some knowers unseen and form others as unable to perceive that erasure. Second, it distinguishes not-seeing from ignorance. Second-order ignorance concerns what one does not know; the non-seer's condition concerns what can register as a candidate for knowledge at all. The non-seer is not missing information that would correct the view, but has been formed with an apparatus of recognition that filters certain knowledges out before any question of knowing them arises. Mills's (1997) racial contract, which establishes nonwhite persons as subpersons while prescribing for its signatories an epistemology of ignorance, comes closest to the claim of co-production, but it locates that co-production in the political order rather than in the ordinary, designed machinery of curriculum, pedagogy, and assessment.

2.4. The Gap

Each of the frameworks examined above contributes something this analysis requires. Hidden curriculum theory establishes that educational systems transmit epistemological hierarchies implicitly. Epistemic injustice theory names the specific wrongs done to marginalized knowers within those hierarchies. Epistemologies of ignorance theory demonstrates that dominant-group not-knowing is actively produced, not incidentally maintained. Together, they constitute a substantial scholarly inheritance.

What they do not, either singly or together, fully theorize is the educational infrastructure — the designed and reproduced architecture of curriculum, pedagogy, and assessment — through which

these effects are produced simultaneously, sustained mutually, and naturalized universally as the ordinary, neutral functioning of educational systems. Table 1 renders these overlapping contributions and their respective limits in a form that may clarify what remains unaccounted for and why a new conceptual tool is needed to account for it.

Table 1 *Situating the architecture of not-seeing within related theoretical frameworks*

Dimension	Hidden Curriculum	Epistemic Injustice	Epistemologies of Ignorance	Architecture of Not-Seeing
Central concept	The unstated norms, values, and expectations transmitted through educational structures, routines, and social relations, beyond the explicit curriculum.	Wrongs done to persons specifically in their capacity as knowers, including testimonial injustice (credibility deficit) and hermeneutical injustice (interpretive marginalization).	The systematic production of ignorance, particularly among dominant groups, as a function of social position and power arrangements.	The curricular, pedagogical, and assessment infrastructures through which credentialist systems erase epistemic agency while normalizing that erasure as neutrality, rigour, or objectivity.
Primary theoretical concern	Socialization. How schools teach compliance, hierarchy, and dominant cultural norms implicitly.	Epistemic harm to individuals. How knowers are wronged through credibility judgments and interpretive exclusion.	How not-knowing is actively produced and maintained, particularly white ignorance and sanctioned ignorance.	How educational infrastructure simultaneously produces the unseen and the non-seer through the same mechanisms.
What it illuminates	Schools transmit ideological content beyond official knowledge. Hidden lessons in obedience, competition, and passivity shape learners.	Marginalized knowers are systematically discredited or lack conceptual resources to make sense of their experiences.	Ignorance is not absence but presence: actively produced, structurally maintained, and epistemically functional for dominant groups.	Credentialist systems produce differential epistemic effects: misrecognition for marginalized learners, shielded non-perception for dominant-group learners. This becomes naturalized as 'how education works.'
Level of analysis	Structural and institutional, but focused on socialization processes and ideological transmission.	Primarily individual and interpersonal. Structural dimensions acknowledged but not centred.	Structural and socio-political. Focuses on group-level epistemic positioning.	Infrastructural. Focuses on the designed mechanisms through which differential epistemic effects are produced and sustained.
How it explains dominant group positioning	Dominant-group learners are socialized into norms that serve their interests, but this is framed as ideological absorption rather than epistemic production.	Dominant-group knowers benefit from unearned credibility. They are not explicitly theorized as produced non-seers.	Dominant-group members are actively produced as ignorant of their own dominance. Ignorance is functional and motivated. Second-order ignorance (not knowing that one does not know) and the ignorance produced through disadvantaged identities are theorized as distinct forms that can work in tandem but are not produced by a single operation.	Dominant-group learners are formed with an apparatus of recognition that filters certain knowledges out before judgment. They are produced as non-seers through the same operation that renders others unseen: not a gap in what they know, but a limit on what can register as knowledge.
Relationship to 'common sense'	Hidden curriculum operates through	Does not centrally address how injustice	Addresses how ignorance becomes	Directly theorizes how acquiescence to

Dimension	Hidden Curriculum	Epistemic Injustice	Epistemologies of Ignorance	Architecture of Not-Seeing
	naturalization but focuses on what is taught implicitly rather than what is rendered imperceptible.	becomes normalized as standard epistemic practice.	normalized and functional but focuses on cognitive and social dimensions rather than educational infrastructure specifically.	credentialist norms becomes mistaken for rigour. The architecture sustains itself by becoming invisible as architecture.
Relationship to 'inclusion' and 'equity'	<p>Inclusion efforts informed by hidden curriculum analysis focus on surfacing implicit norms, diversifying representation, and creating more inclusive classroom climates.</p> <p>Tends to address what is taught and how learners are socialized without interrogating the epistemic infrastructure that determines what counts as knowledge.</p> <p>Can result in adding diverse content while leaving underlying epistemological hierarchies intact.</p>	<p>Inclusion efforts focus on correcting credibility deficits, amplifying marginalized voices, and developing epistemic virtues such as testimonial justice.</p> <p>Remedies tend toward changing attitudes, dispositions, and interpersonal practices rather than infrastructure.</p> <p>Risks tokenistic inclusion—bringing marginalized knowers into existing spaces without changing the epistemic terms of their recognition.</p>	<p>Recognizes that dominant-group ignorance is actively maintained and that inclusion requires disrupting the comfort of not-knowing.</p> <p>Emphasizes structural change over individual education.</p> <p>Less prescriptive about educational design specifically.</p> <p>Can inform critical pedagogy but does not directly address how credentialist structures shape what inclusion can accomplish.</p>	<p>Explains why inclusion efforts frequently fail: reformers working from within the same epistemic architecture reproduce its logic.</p> <p>The architecture absorbs and neutralizes inclusion by appearing to address it while leaving infrastructure intact.</p> <p>Genuine equity requires not merely including diverse voices but transforming what counts as knowing, who is positioned as knower, and how recognition operates.</p> <p>Shifts the goal from inclusion (bringing people into existing structures) to epistemic transformation (redesigning the structures themselves).</p>
Implications for curriculum design	<p>Make the implicit explicit.</p> <p>Surface hidden norms and values.</p> <p>Design curriculum that names what was previously unnamed.</p> <p>Diversify content to challenge dominant ideological transmission.</p>	<p>Design for epistemic inclusion.</p> <p>Ensure marginalized knowers are represented as credible sources.</p> <p>Include interpretive frameworks that allow marginalized experiences to become intelligible.</p> <p>Attend to whose knowledge is cited, assigned, and validated.</p>	<p>Design curriculum that disrupts comfortable ignorance.</p> <p>Include content that makes dominance visible to dominant groups.</p> <p>Challenge the epistemology of the unmarked norm.</p> <p>Prioritize discomfort and reckoning over affirmation.</p>	<p>Move from content diversity to epistemic infrastructure transformation.</p> <p>Redesign what counts as valid knowledge, not just which knowledge is included.</p> <p>Interrogate how abstraction, decontextualized standards, and credentialing function as mechanisms of erasure.</p> <p>Ask not “is this curriculum inclusive?” but “what ways of knowing does this structure make visible or invisible?”</p>
Implications for pedagogical practice	<p>Critical pedagogy.</p> <p>Help learners decode implicit messages.</p> <p>Create spaces for questioning institutional norms.</p> <p>Foster awareness of how schooling socializes.</p>	<p>Cultivate epistemic virtues in educators and learners.</p> <p>Practice testimonial justice (crediting marginalized knowers appropriately).</p>	<p>Pedagogy of discomfort: engage dominant-group learners in confronting what they have been taught not to know.</p> <p>Move beyond additive multicultural approaches toward</p>	<p>Make the architecture visible to all learners—not just marginalized learners who already experience its effects.</p> <p>Teach dominant-group learners to perceive how dominance is reproduced (this is</p>

Dimension	Hidden Curriculum	Epistemic Injustice	Epistemologies of Ignorance	Architecture of Not-Seeing
		Create conditions for hermeneutical justice (developing shared interpretive resources). Attend to whose contributions are heard, believed, and built upon.	epistemological disruption. Recognize that resistance to learning is itself symptomatic.	pedagogical work, not moral exhortation). Position epistemic visibility as a learning outcome. Shift from teaching content to interrogating the conditions of knowing.
Implications for democratic education	Prepare citizens to recognize ideological manipulation and implicit socialization. Foster critical consciousness as foundation for democratic participation.	Democratic deliberation requires epistemic fairness. Citizens must be able to contribute as knowers. Epistemic injustice undermines democratic voice and participation.	Democracy requires citizens who can perceive how their own ignorance has been produced. White ignorance and sanctioned ignorance distort public deliberation. Genuine democratic participation requires reckoning with what dominant groups have been taught not to know.	If citizens cannot perceive how dominance is reproduced through knowledge systems, democratic deliberation is compromised at its foundation. Epistemic visibility is a precondition for meaningful democratic participation. Citizens produced as non-seers cannot deliberate about what they cannot perceive. Democratic education must make the architecture itself an object of inquiry.
Limitations for theorizing the architecture of not-seeing	Focuses on socialization and ideology rather than epistemic infrastructure. Does not adequately address how systems produce differential epistemic effects (non-seers and unseen) simultaneously.	Individual and interpersonal framing. Does not fully address how educational structures produce epistemic positioning systematically. Remedies focus on individual virtue (epistemic responsibility).	Addresses production of ignorance but not specifically the educational infrastructure through which this occurs. Does not centre credentialism as the operative epistemology. Treats dominant-group ignorance and the ignorance of disadvantaged identities as distinct forms rather than as co-produced by a single mechanism.	This paper offers a conceptual tool. Its limitations will emerge through application, critique, and dialogue.
References	Jackson (1968); Apple (2004); Giroux & Penna (1979); Margolis et al. (2001); Freire (1970/2000); Bourdieu & Passeron (1970/1990)	Fricker (2007); Dotson (2011); Medina (2013); Kidd et al. (2017)	Mills (1997, 2007); Spivak (1988); Tuana (2006); Sullivan & Tuana (2007); Proctor & Schiebinger (2008); Boler (1999)	Ahmed (2012); Collins (1979); Fraser (2000); this paper

3. The Architecture and How It Works

The gap identified at the close of the preceding section requires a conceptual tool precise enough to name what existing frameworks leave unexplained. This paper proposes the following definition:

The **architecture of not-seeing** refers to the interlocking curricular, pedagogical, and assessment infrastructures through which credentialist education systems simultaneously erase the epistemic agency of marginalized learners and foreclose the perceptual capacity of dominant-group learners,

producing both the unseen and the non-seer through the same mechanisms, while naturalizing both effects as the ordinary, neutral functioning of education.

Architecture here names not a blueprint but a sediment, the accumulated outcome of choices made across time, reproduced through practice rather than maintained by design. The definition does several things at once. It locates the problem at the infrastructural level; not in individual attitudes, not in policy failures, not in the prejudices of particular educators, but in the designed and reproduced architecture of educational systems themselves. It names credentialism as the operative epistemological mechanism: the system through which knowledge validity is determined by the institutional credentials of the knower rather than the contribution of the knowledge. And it identifies a dual production that no existing framework has centred: the simultaneous making of the unseen and the non-seer through identical mechanisms, sustained under the appearance of rigour, objectivity, and neutral institutional practice.

To understand how this architecture operates, it is necessary to trace its three constitutive mechanisms.

3.1. Abstraction from Lived Context

The first mechanism is the requirement that legitimate knowledge be abstracted from the conditions of its production. Within credentialist educational systems, knowledge earns epistemic authority by demonstrating its independence from the particular: from specific places, specific relationships, specific bodies, specific histories. The more a knowledge claim can be generalized (e.g., decontextualized, universalized, made portable across contexts) the more it registers as rigorous, objective, and educationally valid.

This requirement is not presented as a choice. It is built into the assessment infrastructure: into the design of examinations that strip context from knowledge claims and reward decontextualized recall; into the academic essay form that requires argument to proceed by abstraction rather than narrative or relational reasoning; into the peer review process that treats universalizability as a marker of scholarly quality. Bernstein (2000) identifies these structural preferences as features of classification and framing; the mechanisms through which educational systems define what counts as legitimate knowledge and regulate its transmission. Apple (2004) extends this analysis to show how such preferences encode ideological commitments while presenting themselves as neutral pedagogical choices.

The consequences for knowledges that are constitutively contextual, grounded in specific places, relationships, and intergenerational transmission, are architectural rather than evaluative. Such knowledges do not arrive in decontextualized form because decontextualization would destroy them. You cannot abstract a Guardian's knowledge of a specific coastline from the relationships, observations, and responsibilities through which that knowledge was built without producing something categorically different. The architecture does not evaluate this knowledge and find it wanting. It cannot process the form in which the knowledge exists. Invisibility is produced before judgment occurs.

For dominant-group learners, the same mechanism operates differently. The abstraction requirement aligns with the forms in which their knowledge is already held and transmitted (e.g., text-based, individually authored, institutionally contextualized) and so registers not as a structural constraint but as the natural shape of legitimate knowledge. The mechanism that produces invisibility for some produces transparency for others: the architecture becomes, for dominant-group learners, simply how education works.

3.2. Decontextualized Standards of Legitimacy

The second mechanism extends the first. If legitimate knowledge must be abstracted from lived context, then the standards by which knowledge is evaluated must themselves be context-independent: universal, objective, and applicable across all knowledge claims regardless of their origin. Rigour, in this framework, means the same thing everywhere. Objectivity is a property of the knowledge claim, not of the relationship between the knower and the known.

These standards function as gatekeeping mechanisms. They do not merely describe what legitimate knowledge looks like. They determine, in advance, which knowledge can enter the space of evaluation. A knowledge claim that does not present itself in the authorized form (e.g., the peer-reviewed article, the credentialed testimony, the institutionally validated assessment) is not evaluated against the standard and found deficient. It is not evaluated at all. The standard forecloses rather than assesses.

Ahmed (2012) observes that institutions often function by making certain bodies and certain ways of being feel out of place, not through explicit exclusion but through the accumulated weight of norms that were built without reference to those bodies or ways of being. The decontextualized standard of legitimacy operates precisely this way. It was built within and for a specific epistemological tradition, and it functions universally only within that tradition. For knowledges outside it, the standard is not a measuring instrument but a boundary.

For dominant-group learners, this mechanism is again invisible as a mechanism. The standards of legitimacy that govern what counts as rigorous, objective, and valid align with the epistemological tradition in which they have been educated. They do not experience the standard as a standard, as one possible framework for evaluating knowledge among others, but as the self-evident description of what knowledge is. The mechanism that excludes produces, in the same movement, the perception that nothing is being excluded.

3.3. Institutional Recognition as Proxy for Knowing

The third mechanism is the substitution of institutional recognition for epistemic validity. Within credentialist educational systems, the question of whether someone knows something is answered, structurally, by the question of whether an institution has certified that they know it. The credential (e.g., the degree, the certification, the accreditation) functions not as evidence of knowing but as its replacement (White, 2026). Knowledge without institutional recognition is, within this architecture, not knowledge. The logic has a long history. Collins (1979) argued that the growth of credential requirements owed more to competition among status groups than to the technical demands of work, so that credentials certify cultural membership at least as much as competence.

This substitution has consequences that extend well beyond individual learners. It determines whose voice is authorized in curriculum design, whose expertise is consulted in policy development, whose knowledge is assigned in educational programs, and whose contribution is legible as a contribution at all. The uncredentialed knower — the Elder whose understanding of ecological systems spans generations of relational observation; the community health worker whose knowledge of a specific population's needs exceeds that of any visiting specialist; the Guardian whose stewardship knowledge is constitutive of the land it concerns — is not evaluated against credentialed knowledge and found less valid. They are structurally excluded from the space in which validity is conferred.

For dominant-group learners, the credential functions as confirmation rather than substitution: they have credentials because they know things, and knowing things leads to credentials. The circularity

is invisible as circularity. The mechanism that forecloses epistemic agency for some produces epistemic authorization for others, and produces it as deserved.

The argument does not require credentials to be epistemically empty, and it should not be read as claiming they are. Where a credential serves as sufficient evidence of competence, as a surgeon's licence or an engineer's seal often does, the proxy frequently works, and the public relies on it for good reason. The architecture operates at a different point: where institutional recognition becomes a necessary condition of knowing, so that the absence of a credential is read as the absence of knowledge. Nor does the argument deny that credentialing has served inclusion. For members of historically excluded groups, a credential can offset the credibility deficit that identity prejudice would otherwise impose (Fricker, 2007), and credentials have opened professions and positions of authority that would otherwise have stayed closed. But the architecture predicts the terms of that inclusion. Recognition of prior learning is a clear case: it is inclusive in intent, and it works by translating uncredentialed knowledge into the forms a credential can read. Credentialing extends recognition to new knowers; it does not change what recognition requires.

4. The Dual Production: The Unseen and the Non-Seer

What makes the architecture of not-seeing theoretically distinctive is not the existence of these three mechanisms — each has been identified, in partial form, by prior scholarship — but what they produce simultaneously and through the same operations.

For marginalized and historically excluded learners, the three mechanisms combine to produce epistemic erasure: their knowledge is rendered illegible by the abstraction requirement; their ways of knowing are excluded by decontextualized standards of legitimacy; their epistemic authority is foreclosed by the substitution of institutional recognition for knowing. They experience this as misrecognition in Honneth's (1995) sense, a denial of recognition that constitutes a specific form of harm, positioning them as deficient rather than differently knowing, and often as personal failing, because the architecture has no visible surface against which the structural nature of their exclusion can be perceived. Fraser's (2000) status model sharpens this point for an infrastructural analysis. On her account, misrecognition is less a psychological injury than a matter of institutionalized patterns of cultural value that deny some people parity of participation in social life. The architecture of not-seeing is such a pattern, built into curriculum, standards, and credentials rather than into attitudes. This is the production of the unseen.

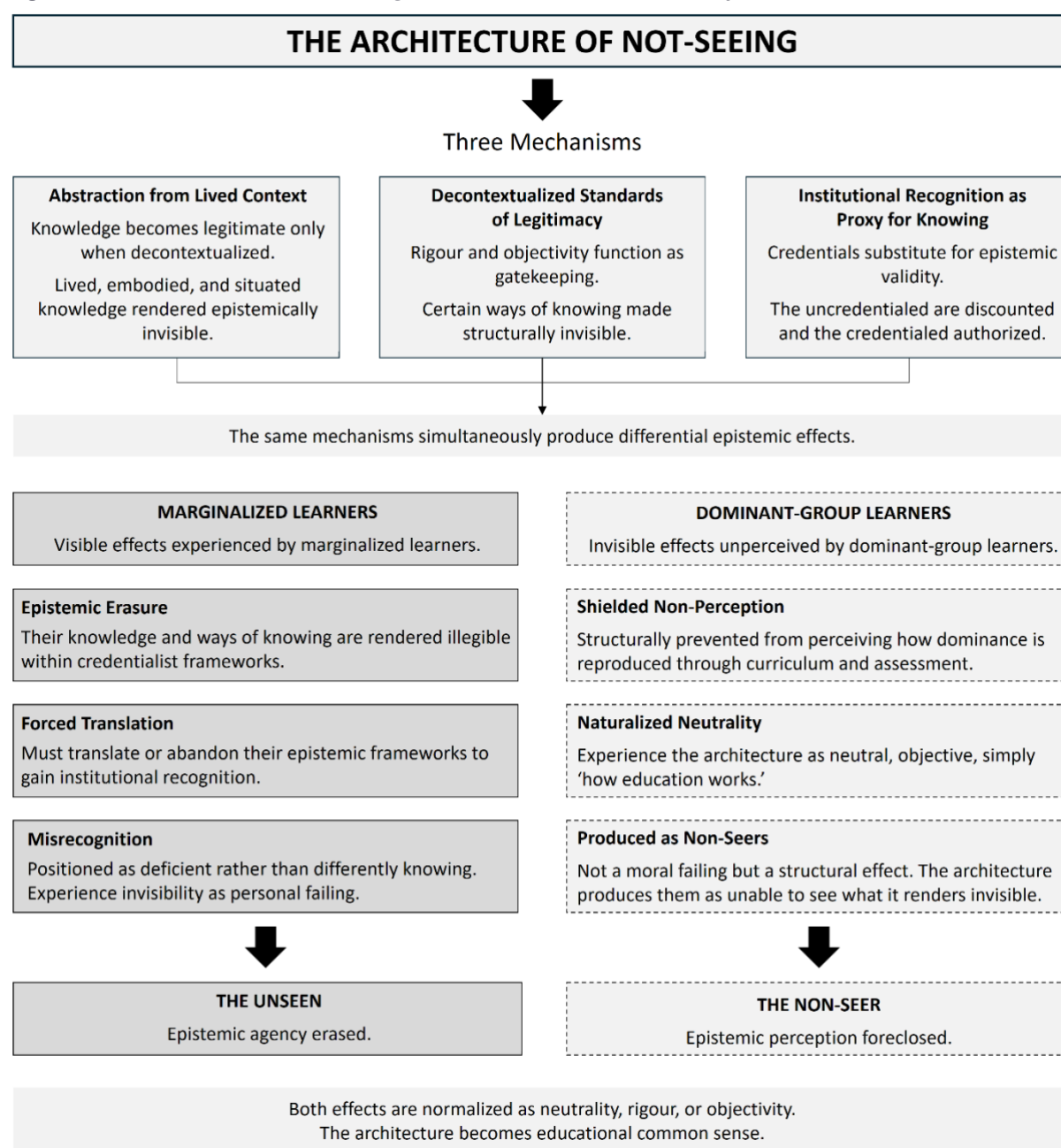
For dominant-group learners, the same mechanisms produce something structurally different. Because the architecture aligns with their epistemological formation, it is transparent to them; not visible as architecture but experienced as the natural shape of education. They are structurally prevented from perceiving how dominance is reproduced through curriculum and assessment, not because they lack moral seriousness, but because they have been produced, through the same mechanisms, as unable to see what the architecture renders invisible. This is the production of the non-seer.

The critical theoretical point is that the non-seer is not a moral category but a structural one. Dominant-group learners are not produced as non-seers because they are indifferent or malicious. They are produced as non-seers because the architecture that erases others simultaneously forecloses their perception of that erasure, and presents both effects as the neutral, objective, rigorous functioning of education. This is why reform efforts so frequently reproduce the logic they intend to disrupt. They are designed by non-seers working within the same epistemic infrastructure,

applying the same standards of legitimacy, in the same institutional contexts, that produced their non-seeing in the first place.

Both effects, the unseen and the non-seer, are naturalized as educational common sense. The architecture becomes invisible as architecture. Figure 1 renders these mechanisms and their differential epistemic effects in a form that may make the structural logic of this production visible in a single view. Note that the architecture of not-seeing operates through the same mechanisms to produce both the unseen (i.e., marginalized learners whose epistemic agency is erased) and the non-seer (i.e., dominant-group learners who are structurally prevented from perceiving that erasure). The dashed borders on the right indicate that these effects remain invisible to those experiencing them. The architecture's success depends on dominant-group learners not perceiving their own production as non-seers.

Figure 1 *The Architecture of Not-Seeing: Mechanisms and Differential Epistemic Effects*



4.1. Why the Architecture Sustains Itself

A reader arriving at this point in the argument might reasonably ask: if the architecture of not-seeing is structural rather than conspiratorial, if it is the ordinary functioning of educational systems rather than the deliberate intention of malicious actors, then why does it persist? Educational systems are not static. They are subject to continuous reform — curriculum reviews, equity audits, diversity initiatives, decolonization commitments, inclusive pedagogy frameworks. If the architecture produces harms that are, at some level, visible to those working within it, why does reform not disrupt it?

This section argues that the answer lies in a feature of the architecture that the preceding analysis has already implied but not yet centred: the architecture produces the very actors who are tasked with reforming it. There is no outside position from which reform can be conducted. Every educator, learner, reformer, and policymaker who engages with the educational system has been educated within it; has been produced, to varying degrees and in varying ways, by the same epistemic infrastructure they are now attempting to change. This is not a counsel of despair. It is a description of the condition that any serious reform effort must reckon with.

4.2. The Educator

Educators are products of credentialist education before they are its practitioners. Their formation as knowers, including their sense of what constitutes rigorous knowledge, valid argument, legitimate evidence, and appropriate pedagogical relationship, occurred within the same architecture they now enact. This is not a failure of professional development or critical reflection. It is the ordinary consequence of being educated: one learns, among other things, what education looks like, what knowledge feels like, and what it means to know something well. Lortie (1975) called this the apprenticeship of observation: long before any formal preparation, future teachers spend thousands of hours watching teaching from the student's desk and absorb its forms as the forms of teaching itself.

When educators design curriculum, they draw on epistemological frameworks that were built within them before they had the critical vocabulary to examine them. When they assess student work, they apply standards of legitimacy that were transmitted to them as the natural shape of academic quality. When they make judgments about whose contributions are rigorous and whose are not, they are enacting an infrastructure they did not design and, in most cases, have never been invited to interrogate. The architecture is reproduced not through bad faith but through professional competence; through educators doing their jobs well, by the standards the architecture has taught them to apply.

This does not mean educators are helpless within the architecture. It means that the work of seeing the architecture, of making it an object of critical attention rather than a transparent medium of practice, is itself a pedagogical accomplishment, not a baseline condition of professional life. Most educators were never taught to see it because the architecture's self-concealment is one of its constitutive features.

4.3. The Learner

Learners are naturalized into credentialist epistemology before they encounter it as a formal educational framework. By the time learners arrive in educational institutions, they have already absorbed, through family, community, media, and prior schooling, the foundational equations of the architecture: that credentials confer authority, that institutional recognition confirms knowledge, that decontextualized reasoning is more rigorous than relational or place-based knowing. These are not

conclusions they have reached through inquiry. They are the epistemological water in which they have been swimming.

The architecture is particularly effective in producing naturalization among dominant-group learners, for whom its standards of legitimacy align with their prior formation. Such learners do not experience credentialism as an imposition or a constraint. They experience it as education simply working, as the reasonable and neutral process through which knowledge is identified, validated, and transmitted. The curriculum they encounter confirms what they already know, in the forms through which they already know it, assessed by standards built in their epistemological image. The architecture's invisibility is most complete for those it most privileges.

For marginalized learners, naturalization operates differently and more violently. They too absorb the architecture's epistemological norms, learning to measure their own knowledge against standards that were not built for or with them, to experience their ways of knowing as deficient rather than different, to seek institutional recognition as the condition of legitimate knowing. The architecture produces in them not transparency but internalized misrecognition: the sense that their epistemic insufficiency is personal rather than structural, a failing to be remedied by harder work within the existing framework rather than evidence of a framework built to exclude them. Fanon (1952/2008) identified this internalization as itself a structural achievement; the colonized subject learning to see themselves through the evaluative framework of the colonizing system, experiencing as personal inadequacy what is in fact the patterned outcome of a system designed to produce that perception.

4.4. The Reformer

Reform efforts within educational systems are characteristically designed and led by people who have been most successfully produced by those systems and who have navigated credentialist infrastructure with sufficient facility to reach positions from which reform is possible. This is not incidental. Credentialist systems confer the institutional authority to reform them on those who have demonstrated their competence within them. The reformer's credential is, structurally, evidence of their formation within the architecture.

This produces a condition that is not paradoxical but architectural. Reform efforts reproduce the logic of the system they intend to disrupt because their designers are working from within the same epistemic infrastructure, applying the same standards of legitimacy, in the same institutional contexts, that produced the problem being reformed. Diversity initiatives that add content from marginalized knowledge traditions without interrogating the standards by which that content will be evaluated, assessed, and weighted reproduce the architecture's logic while appearing to challenge it; what Ahmed (2012) identifies as the institutional capacity to absorb diversity work without structural change, incorporating the language of inclusion while leaving the epistemological infrastructure intact. Inclusion frameworks that bring marginalized knowers into existing epistemological structures without changing the terms of their recognition leave the infrastructure intact. Decolonization commitments that are implemented through credentialist planning processes, such as strategic plans, logic models, key performance indicators, apply the architecture's tools to the task of dismantling it, and predictably find the architecture unmoved. Lorde's (1984) warning that the master's tools will never dismantle the master's house applies here with institutional precision.

This is not a criticism of reformers' intentions, which are often serious and sustained. It is a structural observation. Reform conducted from inside the architecture, using the architecture's own instruments, by actors produced by the architecture, tends to address the architecture's surface

manifestations while leaving its foundations undisturbed. The architecture absorbs reform by making reform legible only in its own terms.

4.5. The Policymaker

Policymakers occupy the outermost ring of the cycle but are no less produced by the architecture than those closer to the classroom. They demand credentials as thresholds of legitimate expertise because they were educated in systems that taught them this equation. They mandate standardized assessments because they were assessed by standardized instruments and learned, through that experience, that standardization is the natural form of educational rigour. They resource institutional recognition because institutions recognized them, and they arrived at positions of policy authority through pathways that the architecture designed and maintained.

When policymakers consult experts about educational reform, the consultation process itself reproduces the architecture: experts are identified by their credentials, their testimony is weighted by their institutional affiliations, their recommendations are evaluated against standards of evidence that the architecture has pre-authorized — a process that enacts, at the level of policy, what Fricker (2007) identifies as testimonial injustice and Dotson (2011) as epistemic silencing, systematically underweighting the knowledge most needed to understand the architecture's effects. The knowledges most needed to understand the architecture's effects — the knowledge of communities whose educational needs the system cannot process, of learners whose epistemic agency it has erased, of practitioners who have watched reform efforts fail in patterned ways — are structurally underweighted in the processes through which policy is made. The silent, artificial harmony described in Section 2.1 operates here with particular force. The gap between what the system can process and what communities need is understood, acknowledged in consultation documents and policy preambles, and remedied by policy instruments the architecture has already determined to be legitimate.

4.6. The Cycle Without an Exit

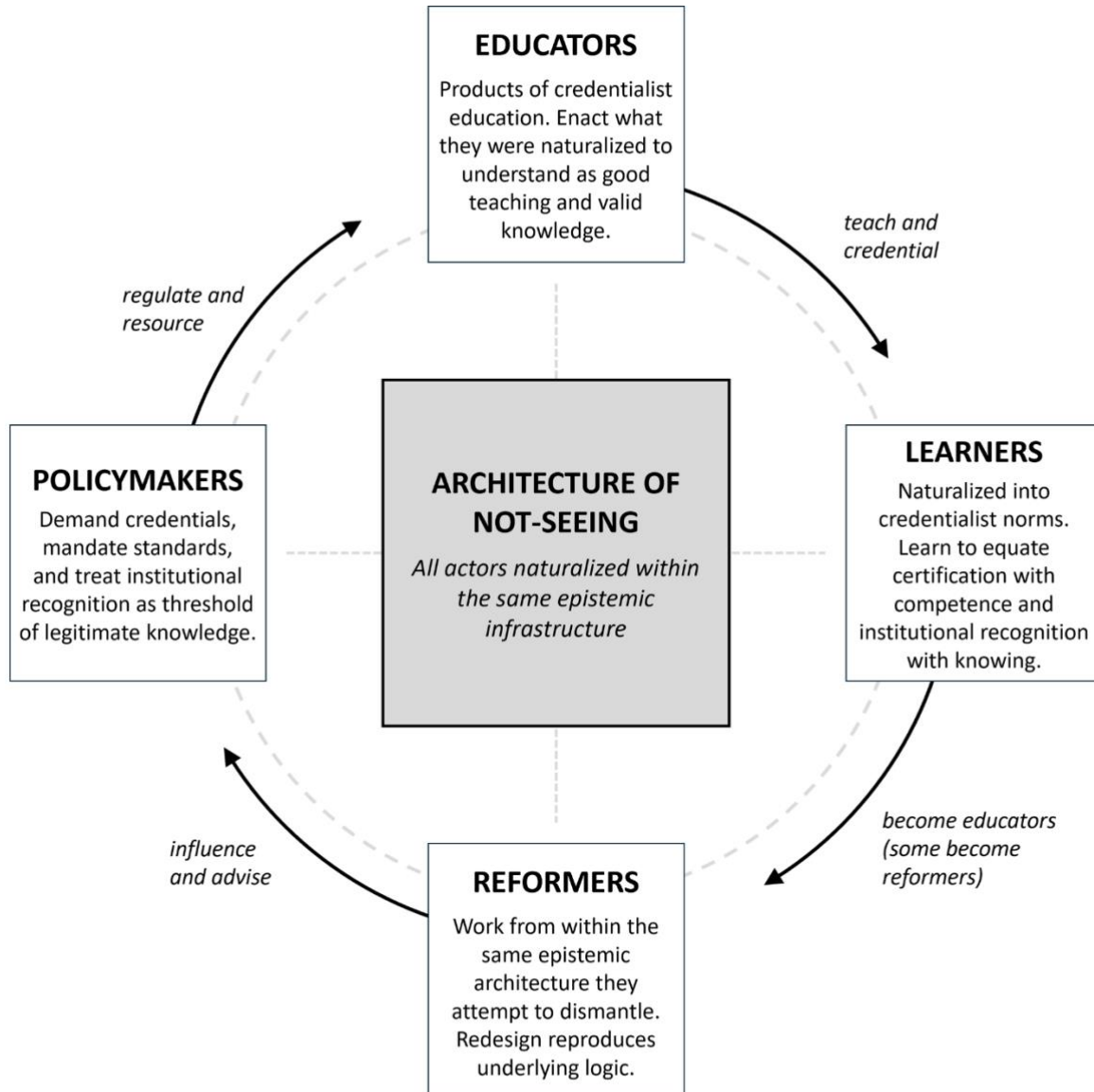
What the preceding analysis reveals is not a linear chain of causation but a self-sustaining cycle: educators produce learners, learners become educators and reformers, reformers advise policymakers, policymakers regulate educators. At every point in the cycle, the architecture of not-seeing is reproduced, not because each actor chooses to reproduce it, but because each has been produced by it and has no position outside it from which to see it whole.

The architecture is self-perpetuating not through conspiracy but through universality. Virtually everyone alive has been educated within it. Its epistemological norms are not the norms of a dominant group imposed on others. They are the shared formation of educators and learners, reformers and policymakers, critics and defenders alike. This is precisely what makes the architecture so difficult to interrupt: the critical tools available to those who would challenge it were themselves produced within it. In this respect the architecture resembles the self-reproducing system Bourdieu and Passeron (1970/1990) described, with the difference noted in Section 2.1: what it reproduces is not only a hierarchy of cultures but a boundary around what counts as knowledge.

Interruption is not impossible. But it requires something different from reform in the conventional sense; something closer to what this paper has been attempting: making the architecture visible to those it has produced as non-seers, not as a moral accusation but as a structural description. This is, at its core, a pedagogical task. Figure 2 renders the self-sustaining cycle in a form that makes its logic visible as a system rather than a sequence of individual choices. Solid arrows indicate the cycle of reproduction: educators teach learners, learners become educators and reformers, reformers

influence policymakers, policymakers regulate educators. Dashed lines indicate that all actors are simultaneously connected to and naturalized within the central architecture; each has been produced by the system they perpetuate. The cycle sustains itself not through conspiracy but through universal socialization into credentialist epistemology.

Figure 2 *The Self-Sustaining Architecture: Universal Naturalization Across Educational Actors*



The architecture is self-perpetuating because virtually everyone alive has been educated within it. There is no outside position from which to reform. Each actor—educator, learner, reformer, policymaker—has been produced by the architecture and reproduces it in turn. The cycle has no natural exit point; interruption requires making the architecture visible to those it has produced as non-seers.

5. What This Makes Possible

The preceding sections have traced the architecture of not-seeing from its constituent mechanisms through to the self-sustaining cycle that makes it so resistant to reform. What the concept makes possible, however, is not simply a more precise diagnosis of educational failure. Naming the architecture creates conditions for a different kind of educational thinking; not a program of reform in the conventional sense, but a reorientation of the questions that curriculum designers, pedagogical

practitioners, and democratic educators are able to ask. This section traces three such reorientations.

5.1. For Curriculum Design: From Content to Infrastructure

The dominant response to epistemological exclusion in curriculum design has been additive. This is what Banks (1993) identifies as the incorporation of diverse content, authors, and perspectives into existing curriculum structures without changing the structure itself. This response is not wrong, but it is insufficient in a specific and now nameable way. Adding diverse content to an existing curriculum infrastructure leaves intact the mechanisms through which that content will be evaluated, weighted, and assessed: the abstraction requirement, the decontextualized standard of legitimacy, the credentialist threshold of authorization. Content that arrives in non-canonical forms, that resists decontextualization, or that is held by uncredentialed knowers passes through the same architectural filters regardless of its inclusion in the syllabus. The architecture absorbs the addition without structural disturbance.

What the architecture of not-seeing makes possible for curriculum designers is a different set of questions. Not "is this curriculum inclusive?" but "what ways of knowing does this structure make visible or invisible?" Not "have we included Indigenous knowledge?" but "does this assessment framework have the apparatus to recognize knowledge that is oral, relational, and place-based as knowledge?" Not "does this program represent diverse perspectives?" but "what epistemic work do our standards of legitimacy perform, and for whose knowledge traditions were they built?"

These are infrastructural questions rather than content questions. They require curriculum designers to treat the architecture itself — the forms of knowledge recognized as legitimate, the standards through which validity is conferred, the assessment instruments through which knowing is measured — as objects of inquiry rather than neutral media of educational practice. This is harder work than diversifying content. It requires interrogating the epistemological foundations of curriculum design rather than its surface manifestations. But it is the work that the architecture of not-seeing makes newly legible as necessary.

5.2. For Pedagogical Practice: Making the Architecture Visible

The pedagogical implications of the architecture of not-seeing differ depending on which learners one is considering, and that difference is itself pedagogically significant.

For marginalized learners, the architecture's effects are already experienced, if not always named. What pedagogy can offer here is what it has always offered at its best: the naming. Making the architecture visible to learners who have been experiencing its effects as personal failing, who have internalized misrecognition as inadequacy, is an act of epistemic restitution. It does not change the architecture immediately, but it changes the interpretive framework through which its effects are understood. The learner who can name the mechanism is no longer simply subject to it; they have a critical vantage point from which its operations become visible as structural rather than natural.

For dominant-group learners, the pedagogical task is different and in some ways more demanding. The architecture is transparent to them; not because they are uncritical, but because it was built in their epistemological image and aligns with their prior formation. Making it visible to them is not a matter of naming what they already experience; it requires disrupting the experience of neutrality itself. Boler's (1999) pedagogy of discomfort names this challenge precisely: dominant-group learners are not simply uninformed about the architecture's effects, they are invested, often without knowing it, in the comfort of not perceiving them. Pedagogical work that makes the architecture

visible to dominant-group learners is therefore not primarily informational. It is transformational, and it will meet resistance that is epistemological before it is moral.

The shared pedagogical goal, across these different starting points, is epistemic visibility as a learning outcome; not merely critical awareness in a general sense, but the specific capacity to perceive how educational infrastructure produces differential epistemic effects, and to recognize that production as structural rather than natural. This is, in the fullest sense, a curriculum goal: something that can be designed for, taught toward, and assessed, though the assessment instruments would need to be built for the purpose rather than borrowed from the architecture being interrogated.

5.3. For Democratic Education: Epistemic Visibility as Precondition

Epistemic democrats have argued that democracy's value lies partly in its capacity to draw on the dispersed, situated knowledge of its citizens (Anderson, 2006), and epistemic injustice scholarship shows how that capacity is weakened when some citizens are not heard as knowers (Fricker, 2007). Less attention has gone to a prior question: whether citizens can perceive the conditions under which knowledge is authorized and excluded at all. The architecture of not-seeing makes that question impossible to ignore. Democratic deliberation, the collective reasoning through which citizens identify problems, evaluate evidence, weigh competing claims, and make decisions about shared life, presupposes that participants can perceive the conditions under which knowledge is produced, authorized, and excluded. Citizens who cannot perceive how dominance is reproduced through knowledge systems are not equipped to deliberate about the epistemic dimensions of public problems, because those dimensions are, for them, structurally invisible.

This is not an abstract concern. The suppression of climate knowledge, the dismissal of Indigenous land-based expertise in resource management decisions, the underweighting of community health knowledge in public health policy; these are not failures of individual reasoning, but consequences of democratic deliberation conducted by citizens produced as non-seers. They bring to public reasoning the epistemological formation the architecture gave them: the sense that credentialed expertise is the natural form of authoritative knowledge, that decontextualized evidence is more reliable than situated knowledge, that institutional recognition is a reasonable proxy for epistemic validity. The architecture's effects are reproduced in the deliberative processes through which democratic societies are supposed to correct their own errors.

What the architecture of not-seeing contributes to democratic education theory is the recognition that epistemic visibility is not a supplementary educational aim but a foundational one. Preparing citizens for democratic participation requires, among other things, preparing them to perceive how knowledge systems produce and exclude; to see the architecture as architecture, rather than as the natural shape of how knowledge works. This is not the same as teaching citizens to distrust expertise, which is a different and dangerous move. It is teaching them to ask, of any knowledge claim and any knowledge system, whose ways of knowing it was built to recognize, and what it was built not to see.

5.4. The Limits of This Analysis

Intellectual honesty requires naming what this paper has not done. The architecture of not-seeing is introduced here as a conceptual tool, a theoretical framework developed through argument, illustration, and comparison with adjacent scholarship. It has not been tested empirically in specific educational contexts. Its relationship to other critical frameworks — critical race theory, disability studies, queer theory — remains largely unexplored. Its applicability across different national educational systems and cultural contexts is asserted rather than demonstrated.

These are not weaknesses to be apologized for. They are the natural condition of conceptual work at the moment of its introduction. A theoretical framework earns its place by opening lines of inquiry that were previously difficult to pursue, not by closing them. The architecture of not-seeing does not offer a finished account of epistemological exclusion in educational systems. It offers a lens through which that exclusion becomes newly visible as a structural condition and through which the questions necessary for addressing it become newly askable.

What those questions make possible, for curriculum design, pedagogical practice, and democratic education, is not a program but an orientation. It is an invitation, not a conclusion. The following section takes that invitation seriously.

6. An Invitation, Not a Conclusion

This paper began in Northwest British Columbia, with two Nations whose educational visions the institutional architecture could not process, not because anyone said no, but because the system had no category for yes in the form they were offering it. Those examples were chosen not as exceptional cases but as unusually clear illustrations of an ordinary condition: the structured invisibility of certain knowledges within educational systems that experience themselves as neutral, rigorous, and open to all who meet their standards.

The concept introduced here — the **architecture of not-seeing** — names that condition with more precision than existing frameworks have allowed. It identifies the three mechanisms through which credentialist educational systems produce epistemic invisibility: abstraction from lived context, decontextualized standards of legitimacy, and institutional recognition as proxy for knowing. It traces the dual production those mechanisms achieve simultaneously, the unseen and the non-seer, and locates both effects within a self-sustaining cycle that reform, conducted from inside the architecture, characteristically reproduces rather than disrupts.

Naming the architecture does not dismantle it. A conceptual tool is not a renovation. But it changes what is possible to ask, and in education, as in other domains of human practice, the questions that can be asked determine the futures that can be imagined. So, this paper closes not with prescriptions but with the questions it hopes the concept makes newly askable.

For curriculum designers: what ways of knowing does this structure make visible, and what does it render invisible? What would it mean to ask not whether a curriculum is inclusive, but whether the infrastructure governing what counts as legitimate knowledge was built with, or without, the epistemic traditions it now claims to include? What would curriculum look like if epistemic visibility were its foundational aim rather than its aspirational supplement?

For pedagogical practitioners: what would it mean to teach dominant-group learners to perceive the architecture, not as a moral failing to be confessed, but as a structural condition to be understood? What does it take to position epistemic visibility as a learning outcome, and what assessment instruments would need to be built, rather than borrowed from the existing architecture, to recognize when learners have achieved it?

For democratic educators: what kind of citizen does the architecture produce, and what kind of deliberation becomes possible when citizens can perceive how knowledge systems determine what can be seen, known, and acted upon? What would it mean to treat epistemic visibility not as a curricular enrichment but as a democratic precondition, as foundational to civic preparation as literacy or numeracy?

These questions are not rhetorical. They are research directions, curriculum design problems, and pedagogical challenges that the architecture of not-seeing makes newly nameable. This paper does not answer them. It offers the concept as a tool for those who will.

One final word about position. This paper has argued that the architecture of not-seeing produces non-seers, that dominant-group knowers are structurally prevented from perceiving what the architecture renders invisible. I am, by formation, credential, and institutional accreditation, among those the architecture has most thoroughly produced as a non-seer. Khatibi's (1983) double critique does not resolve that condition. It names it honestly, and holds it under the same critical pressure the paper applies to the architecture itself. What becomes visible from inside the architecture, looked at steadily and without the comfort of pretending to stand outside it, is offered here as a contribution: partial, positioned, and open to the critique that will sharpen it.

The architecture is old. The not-seeing it produces is ordinary. But ordinary conditions, once named, become visible, and what becomes visible can, at last, become an object of genuine educational attention.

7. Declarations

7.1. Conflict of interest

The author declares that there is no conflict of interest to disclose.

7.2. Funding

The author declares that the study received no external funding.

7.3. Author contributions (CRediT)

Lawrence A. White: Conceptualization; Methodology; Formal analysis; Resources; Data curation; Writing—original draft; Writing—review & editing; Visualization; Project administration

7.4. Data availability statement

There are no supplementary data available for this study.

7.5. Ethics approval

The author declares that this study did not require ethics committee approval. The research was conducted in full accordance with applicable ethical standards and principles. The study involved only publicly available data and document analysis; no personal data were collected and no expert opinion was sought.

7.6. Use of artificial intelligence (AI) tools

This paper was developed in part through extended dialogue with Claude (Anthropic), used as an intellectual interlocutor rather than a writing tool. All ideas, arguments, and written text are the author's own. Disclosure here is offered as a matter of methodological transparency, consistent with a paper concerned with how knowledge architectures render their own workings invisible.

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From curricular protection to curricular fragmentation: Examining Türkiye's centralized ECE curriculum for child sexual abuse prevention

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ABSTRACT

Child sexual abuse (CSA) remains one of the most pressing and sensitive challenges facing societies worldwide. In Türkiye, this issue is further exacerbated by cultural taboos, systemic barriers, and underreporting, which hinder effective prevention and intervention efforts. This study examines how Türkiye's centralized Early Childhood Education (ECE) curriculum, the "Maarif Model," incorporates CSA prevention strategies through a structured framework. Using qualitative content analysis, the research investigates the inclusion of critical topics such as bodily autonomy, personal boundaries, and safe practices for children aged 36–72 months. A SWOT analysis sheds light on both the potential and the limitations of the curriculum's design and implementation. While the Maarif Model offers a promising platform for fostering early intervention and resilience, significant challenges remain. Cultural resistance, inadequate teacher training, and inconsistent application threaten its efficacy. This study underscores the need for more substantial efforts to align the curriculum with Türkiye's socio-cultural realities, emphasizing that without addressing systemic and societal barriers, the curriculum's impact may fall short of its transformative goals.

KEYWORDS: Child sexual abuse; Curriculum; Early childhood education; Child rights; Sexual abuse

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1. Introduction

Joël Le Scouarnec, a French surgeon convicted of sexually abusing hundreds of children; Steven van de Velde, a convicted Dutch rapist of a 12-year-old girl, controversially permitted to compete internationally despite his conviction; and Gerald Ridsdale, the infamous Australian Catholic priest whose decades of abuse were shielded by church authorities are the names (Casassus, 2025; Ligman, 2025; Miller, 2025), scattered across countries and professions, represent a chilling truth, which is that child sexual abuse (CSA) is not confined by geography, profession, or ideology. It leaves lasting scars, not only on survivors (Abrahams et al., 2013; Asgary et al., 2013; Crome & McCabe, 1995; Depraetere et al., 2020; Morrison, 2007; Stepakoff, 1998; Thomas & Kopel, 2023; Winkler, 1991) but also on families and communities (Daane, 2005; Lievore, 2005; Morrison, 2007). Survivors often face systemic barriers to justice, compounded by societal stigma that silences their voices and shields perpetrators (Ahrens, 2006; Hall & Last, 1993; Morrison, 2007). These concerns have contributed to increasing attention to prevention approaches that equip children with

developmentally appropriate knowledge about their bodies, personal boundaries, unsafe situations, and ways of seeking assistance.

There is an ongoing fight to protect the vulnerable. Among them (Baker et al., 2009; Cayreyre et al., 2024; Luce et al., 2010; Macy et al., 2007; Macy, 2008; Valan et al., 2024; WHO, 2023), children are particularly at risk, often targeted by individuals with harmful intentions; therefore, CSA is a fact of life. Studies show that CSA often goes unreported (Chandran et al., 2018; Katzenstein & Fontes, 2017; Kenny, 2001; Mathews et al., 2017; Osadan & Reid, 2015), as children lack the knowledge or confidence to disclose their experiences. In Türkiye, CSA is a pervasive issue, with alarming rates of crimes against children, including sexual abuse, compounded by cultural taboos and limited preventive mechanisms (Aydin et al., 2015; Apaydın Cırık et al., 2020; Citak Tunc et al., 2018; Kızıltepe et al., 2022; Koç et al., 2023; Koçtürk & Yüksel, 2018; Kucuk, 2016; Ozbaran et al., 2009; Turla et al., 2022), underscoring the urgent need for CSA education and prevention starting at an early age.

This paper aims to explore how ECE can serve as the frontline in equipping children and caregivers to address this pressing issue and foster a safer, more informed future. To that point, Türkiye's national ECE curriculum (MoNE, 2024a) has been specifically chosen to examine a country that has been famous for such cases. As teacher educators, we are often caught between the macrosystem of mandatory national curricula and the microsystem of the classroom where immediate child protection occurs. This paper reflects on the pedagogical challenge of preparing pre-service teachers in Türkiye to implement the Maarif Model when that very model contains a null curriculum regarding explicit sexual abuse terminology. The following analysis is driven by the need to transform teacher candidates from passive implementers of a centralized framework into critical practitioners capable of bridging these systemic gaps. This study aims to critically assess Türkiye's ECE curriculum within this context by asking: "How does Türkiye's Early Childhood Education Curriculum address concepts relevant to child sexual abuse prevention, and what curricular opportunities exist to strengthen their coherence, developmental appropriateness, and integration?" By evaluating the curriculum's alignment with Türkiye's cultural and societal context, this research seeks to identify both gaps and opportunities for improvement. Strengthening the ECE curriculum is not only essential for preventing CSA but also for fostering a generation that is equipped to build healthier, safer communities.

1.1. Why School-Based CSA Prevention Programs?

In the context of CSA, education plays a critical role in empowering children to identify and report inappropriate behavior. Because children often lack awareness of sexual abuse and self-protection skills, prevention programs play a crucial role in enhancing their understanding and resilience (Kenny et al., 2008). Schools, as primary educational institutions, are ideal settings for such programs due to their capacity to reach diverse groups of children in a cost-effective manner (Wurtele, 2009). Most empirically evaluated interventions in developing countries have concentrated on children of preschool and primary school age, highlighting the importance of tailoring prevention efforts to these formative years (Russell, Higgins, & Posso, 2020); although research indicates that CSA education programs can be beneficial for children across all age groups (Currier & Wurtele, 1996; Kenny et al., 2008; Roberts & Miltenberger, 1999; Topping & Barron, 2009; Wurtele, 1986; 1996; Wurtele & Owens, 1997). School-based CSA prevention programs empower children with age-appropriate knowledge about their rights, body autonomy, and safe practices, fostering open communication and resilience (Citak Tunc et al., 2018; Finkelhor, 2009; Russell et al., 2020; Walsh et al., 2015). By adopting a multidimensional approach that involves every stakeholder of education (Erol, 2007; Işık & Değirmencioğlu, 2018; Özmen, 2021), these programs create a supportive network that encourages early identification of risks and facilitates support for those who disclose abuse (Özmen, 2021).

Furthermore, schools' established infrastructure, equipped with trained personnel and resources, enables the seamless integration of these programs into the educational curriculum.

Despite their potential, these programs face significant challenges. Cultural and societal taboos around discussing abuse can lead to resistance both by parents and teachers (Lu et al., 2022), while inadequate training for teachers (Allen et al., 2020; Çalışandemir et al., 2008; Dolunay-Cug, 2022; Lu et al., 2022; Topping & Barron, 2009; Zeuthen & Hagelskjær, 2013), as well as a lack of educational resources to teach CSA prevention-related content (Helweg-Larsen et al., 2010), may hinder effective implementation. Overcoming these challenges requires sustained efforts, including stakeholder engagement, comprehensive training, and robust follow-up systems. When effectively implemented, school-based CSA prevention programs become vital tools in fostering safer communities, mitigating abuse's long-term impacts, and safeguarding children's rights and well-being.

1.2. Why ECE?

ECE provides a critical opportunity to address CSA prevention proactively. As a foundational stage in a child's development (Freud, 1905; Erikson, 1963; Bloom, 1976; Vygotsky, 1967; Bruner, 1977; Bandura, 1986; Piaget, 2013), ECE serves as an ideal platform to teach age-appropriate concepts such as body autonomy, consent, and personal boundaries (Wurtele et al., 1992), as well as knowledge regarding safety (Kenny et al., 2016). If children are taught early to recognize inappropriate behavior and understand their rights, they are better prepared to navigate challenging situations. By teaching children, the correct anatomical terms as early as possible (Wurtele et al., 1992), school-based CSA prevention programs lay the foundation for future sexual education, enabling children to communicate effectively about inappropriate touch (Boyle & Lutzker, 2005). While the integration of CSA prevention education into early childhood curricula is still limited in many countries (Allen et al., 2020; Demircioğlu & Işık, 2019; Lu et al., 2022; Rispens et al., 1997; Rudolph & Zimmer-Gembeck, 2018; Walsh et al., 2015), Pitts' (2015) suggestion that early childhood CSA prevention programs are being well-received by parents and educators, with no significant negative effects, such as increased anxiety or fear, arising from participation must be if not only encouraging to do so than at least to explore the topic more detailly.

1.3. Why Türkiye?

The widespread issue of CSA within the Catholic Church reflects its global scale (Girod, 2024), whereas the top European countries with the highest reported rates of sexual violence are Sweden, Iceland, and Norway (Statista, 2024b), which are frequently considered to be the most gender-equals in the world (Statista, 2024a). The Turkish context also provides an important setting for examining the relationship between national curriculum and CSA prevention. Türkiye's rating on CSA is unclear because of unreported cases (Berkmen & Seçim, 2019; Doğru et al., 2024; Dolunay-Cug, 2022; Silahlı et al., 2024; Sivilis-Cetinkaya, 2015; Yüksel & Koçtürk, 2020). However, Türkiye's past includes harrowing scandals that have exposed institutional shortcomings and societal blind spots in protecting children. The Karaman child abuse scandal, in which dozens of boys were abused by a teacher associated with the Ensar Foundation, became a national flashpoint (Cerrah et al., 2020; Çevik, 2019; Günaydın & Aşan, 2017). Despite public outrage, this scandal, along with others that followed, was often met with outright attempts at damage control by those in power, raising doubts about the sincerity of institutional reforms.

While the 2010 constitutional amendments codified childrens' rights at the highest legal level in Türkiye (Güler, 2022), questions remain about their practical impact. Scandals like the Karaman case not only reveal systemic failures but also highlight the challenges posed by politicization, as

childrens' rights are frequently debated under the shadow of broader political agendas. Furthermore, mechanisms like parliamentary inquiries and oversight tools, which could bring accountability and transparency, remain underutilized in addressing childrens' rights issues. The Grand National Assembly of Türkiye's research commissions, while theoretically more resistant to political influence, have yet to fulfill their potential in tackling systemic negligence (Güler, 2022). Addressing such failures requires a bipartisan and transparent approach, yet Türkiye's political environment often obstructs such unity, leaving critical issues unresolved (Balci, 2021; Gül, 2008; Ömürlüoğlu, 2020; Tunçel, 2017; Yolcu, 2022). This raises concerns about whether Türkiye's educational reforms genuinely aim to protect children or serve as symbolic gestures to placate public discontent after decades of neglect and scandal. Although official narratives stress progress and reform (MoNE, 2024b; Özer, 2023; 2024), skepticism persists as the public continues to question the sincerity and depth of state's efforts to prioritize children's rights in both policy and practice.

1.4. Why the ECE Curriculum in Türkiye?

The recently introduced "Türkiye Century Maarif Model" (hereafter, TCMM) (MoNE, 2024b) has been heralded by policymakers as a transformative framework, emphasizing virtue, value, and action for the national education system (Özer, 2024). Türkiye's highly centralized education system, in which the TCMM curriculum is applied uniformly across the nation, presents both challenges and opportunities. Unlike decentralized systems such as those in Canada or the United States, where local authorities often shape curriculum design (Feiger, 2024), Türkiye's centralized educational management ensures consistency across regions and socio-economic contexts. While this structure enables widespread implementation of educational reforms, it also raises concerns, particularly given Türkiye's history of superficial or politicized reforms. However, if leveraged effectively, the centralized system could allow policymakers to enact significant changes that reach children from diverse backgrounds with consistent messaging and strategies.

In this context, while Türkiye has made remarkable progress in expanding access to early childhood education, with 95.44% of children aged 5 to 6 enrolled in formal education programs as of 2024 (MoNE, 2024c), there is a critical need to examine the integration of CSA prevention education within the ECE curriculum. By utilizing the centralized nature of the TCMM, there is a unique opportunity to incorporate CSA prevention strategies nationwide, ensuring that all children, regardless of background, receive the same foundational education on body autonomy, consent, and personal boundaries. This alignment could significantly contribute to both individual resilience and a broader cultural shift towards respect and accountability.

To understand the implications of this study, it is necessary to define the highly centralized nature of the Turkish education system. Unlike the bottom-up approaches found in North America or Scandinavia, the MoNE exercises absolute authority over curriculum design, textbook approval, and teacher directives. This structure creates a Single Point of Success or Failure. Because the TCMM is applied uniformly across all 81 provinces, any null curriculum, such as the omission of explicit sexual abuse terminology, becomes a nationwide systemic gap. Conversely, the recent gross enrollment increase of five-year-olds to 95.44% means that even a minor curriculum improvement has the power to protect millions of children simultaneously. The stakes of this analysis, therefore, are not local, but national in scale.

2. Method

2.1. Research Design

This study employed qualitative document analysis to examine the TCMM Early Childhood Education Curriculum (MoNE, 2024a). Qualitative document analysis is appropriate when researchers seek to examine how a particular issue is represented, organized, emphasized, or omitted within an existing document (Morgan, 2022). The study was designed as a curriculum-focused inquiry rather than an evaluation of curriculum implementation. The analysis was informed by qualitative content-analysis principles (Elo & Kyngäs, 2008, Morgan, 2022) and by critical curriculum concepts concerning explicit, hidden, and null curricula (Apple, 2004; Eisner, 1985; Flinders et al., 1986; Giroux, 1983). These concepts were used as interpretive lenses rather than as separate empirical methods. The primary empirical procedure was the systematic examination of curriculum content relevant to CSA prevention. SWOT analysis was subsequently used as an interpretive synthesis tool. It was not treated as an additional method for generating empirical findings. Its purpose was to organize the implications of the documentary findings into strengths, weaknesses, opportunities, and threats while distinguishing curriculum-based observations from broader contextual considerations.

2.2. Data Source and Analysis

The primary data source was the Early Childhood Education Curriculum published by Türkiye's Ministry of National Education as part of the Türkiye Century Maarif Model (MoNE, 2024a). The curriculum covers children aged 36–72 months and includes developmental objectives, learning outcomes, and related pedagogical guidance. The unit of analysis was defined as a discrete curriculum statement or pedagogical passage that addressed, directly or indirectly, one or more concepts relevant to CSA prevention. These concepts included bodily autonomy, personal space, private body parts, boundaries, touch, acceptable and unacceptable interactions, self-protection, help-seeking, trusted adults, and secrets. The analysis also considered the age group and curricular domain in which each relevant element appeared because the distribution of content is important to evaluating its coherence and developmental coverage. The analysis did not treat every occurrence of general concepts such as *respect* or *responsibility* as evidence of CSA prevention. Such concepts were considered CSA-relevant only when their curricular context connected them to bodily boundaries, personal safety, inappropriate interaction, self-protection, or related protective practices. This distinction was introduced to reduce the risk of interpreting general moral or social-emotional objectives as CSA-prevention content without sufficient documentary support.

The analysis proceeded in several stages. First, the curriculum was examined for explicit and conceptually related references to bodily autonomy, personal boundaries, private body parts, touch, safety, self-protection, help-seeking, disclosure, trusted adults, and secrets. Relevant passages were recorded and considered in relation to their developmental age group and curricular domain. Second, the identified passages were organized into conceptually related categories. These categories focused on (1) bodily autonomy and personal space; (2) self-protection and help-seeking; and (3) educator and institutional support. These categories correspond to the principal patterns identified in the curriculum and form the basis of the Findings section. Third, the analysis considered not only the presence of relevant content but also its organization and explicitness. Particular attention was given to whether the curriculum explicitly connected individual protective concepts to CSA prevention, whether concepts appeared across developmental stages, and whether the curriculum provided a coherent progression from body awareness to recognition of inappropriate behavior and help-seeking.

Fourth, passages that appeared to provide contradictory evidence were retained in the interpretation rather than treated as exceptions to be discarded. In particular, the explicit presence of private-body-part terminology, good/bad touch, good/bad secrets, and help-seeking was considered alongside the absence of a clearly articulated overarching CSA-prevention framework. This approach was necessary to avoid the conceptual error of equating the absence of the term *child sexual abuse* with the absence of CSA-relevant educational content.

Finally, the findings were synthesized using a SWOT framework. In this stage, strengths and weaknesses were restricted primarily to characteristics observable in the curriculum itself. Opportunities and threats were treated as interpretive implications informed by the curriculum and relevant literature rather than as direct empirical findings about implementation or society. Claims about teacher competence, classroom practice, parental responses, institutional effectiveness, or societal attitudes were therefore not treated as findings of the document analysis.

2.3. Trustworthiness and Reflexivity

Because the study involves interpretive analysis of a policy document, analytical transparency was prioritized over claims of statistical reliability. The researchers distinguished documentary evidence from interpretation and from normative recommendations throughout the analysis. Interpretive claims were anchored in identifiable curriculum content and were considered against relevant scholarship on CSA prevention and curriculum studies. The researchers also approached the analysis reflexively, recognizing that concepts such as *null curriculum*, *hidden curriculum*, and *bodily autonomy* carry theoretical assumptions. Rather than beginning from the assumption that the TCMML lacked CSA-prevention content, the analysis examined both evidence of inclusion and evidence of omission or under-specification. This was particularly important because the curriculum contains several explicit protective elements. The resulting interpretation therefore emerged from the tension between substantive inclusion and limited curricular integration, rather than from a predetermined conclusion that CSA prevention was absent.

2.4. Limitations

While this study provides a systematic examination of Türkiye's Early Childhood Education Curriculum regarding child sexual abuse (CSA) prevention, several limitations must be acknowledged. First, the empirical scope of this research is strictly limited to the written curriculum document published as part of the Türkiye Century Maarif Model (MoNE, 2024a). This study does not include empirical data gathered from classroom observations, teacher interviews, parent reports, children's perspectives, or actual implementation contexts. Consequently, claims regarding how these curriculum objectives are interpreted, taught, or experienced in practice cannot be established from the present data. Second, while the SWOT analysis provides an interpretive synthesis of curriculum strengths, weaknesses, opportunities, and threats, the broader contextual factors, such as teacher preparation, implementation consistency, and regional variations are discussed as implications supported by literature rather than as directly observed phenomena. Future research incorporating qualitative and quantitative fieldwork with educators, administrators, and parents will be essential to understanding how these curricular components translate into everyday classroom practices.

2.5. Rationale

In Türkiye, CSA remains culturally taboo and frequently underreported. Addressing this issue roots the discussion early in global rights frameworks and sets clear expectations. For example, the United Nations Convention on the Rights of the Child (UNCRC) guarantees children the right to protection

from all forms of abuse (UNICEF, 1989), and the World Health Organization (WHO, 2019) explicitly calls for schools to play an active role in violence prevention. In this regard, Türkiye's national curriculum risks missing an opportunity to meet global benchmarks that frame child protection as both an educational and public health priority.

A curriculum is never a neutral tool; it actively reflects and reinforces societal priorities. Although ECE holds immense potential for early intervention, CSA prevention is frequently neglected in formal education systems. When topics like CSA are omitted, they signal discomfort, stigma, or outright denial. Furthermore, unspoken norms, power dynamics, and traditional expectations within education often prioritize blind obedience and respect for authority over critical thinking, making it harder for children to speak up about abuse. From a critical curriculum perspective, integrating CSA prevention into ECE is not merely an add-on; it challenges the status quo and invites a fundamental shift in how children's rights, bodily autonomy, and safety are approached in education.

This approach is especially urgent given the unprecedented reach of nationwide ECE implementation. According to official data, gross pre-primary enrollment for five-year-olds increased from 55.35% in the 2012/2013 academic year to 95.44% in 2023/2024 (MoNE, 2024c). For children aged 3 to 5, the enrollment rate grew from 30.93% to 57.23% over the same period. This massive expansion means that curriculum choices; specifically, what is included, excluded, or avoided, have direct consequences for nearly all children entering formal education in Türkiye. Consequently, the curriculum becomes a powerful site for either long-overdue change or continued silence around CSA.

Viewed through the lens of Bronfenbrenner's Ecological Systems Theory (1979), a child's development is shaped by multiple environmental layers, including the microsystem (family and school), mesosystem (interactions between settings), and macrosystem (cultural and political ideologies). ECE curricula occupy a critical intersection across these systems. When national curricula fail to provide children with developmentally appropriate knowledge regarding personal safety, boundaries, and abuse prevention, they miss an essential opportunity to intervene at an early, formative stage.

3. Findings

The analysis identified three interrelated areas through which the TCMM ECE curriculum addresses concepts relevant to CSA prevention, namely (1) bodily autonomy and personal space, (2) self-protection and disclosure strategies, and (3) educator and institutional support. The findings indicate that the curriculum contains substantive protective content. At the same time, the content is distributed across learning outcomes and pedagogical guidance rather than being consistently organized under an explicit CSA-prevention framework.

3.1. Bodily Autonomy and Personal Space

The curriculum integrates explicit components aimed at preventing CSA, particularly within the "Active Living through Psychomotor Skills" domain for children aged 60–72 months. This part of the curriculum emphasizes fostering general and personal space awareness, teaching children to "differentiate between general and personal spaces" and to act in ways that respect their personal boundaries (MoNE, 2024a, p. 75). A key focus is on developing bodily autonomy and an understanding of boundaries, enabling children to "identify private body parts" and "distinguish between good and bad touch, as well as acceptable and unacceptable interactions." (MoNE, 2024a, p. 76). Children are expected to articulate their body's position in space and demonstrate respect for personal boundaries during physical movement.

When analyzed through the lens of the hidden curriculum, the TCMM's emphasis on respect and acceptable interactions within the Active Living domain risks reinforcing a pedagogy of obedience rather than one of empowerment. By prioritizing general physical movement boundaries over specific anatomical safety, the implicit message conveyed to children is that bodily autonomy is a matter of etiquette rather than a fundamental right to protection. This hidden curriculum potentially silences the very protective actions the explicit curriculum aims to foster.

3.2. Self-Protection and Disclosure Strategies

Learning outcomes include the ability to articulate their body's position in space, recognize and differentiate general and personal spaces, and demonstrate respect for personal boundaries in their movements and actions. The curriculum also encourages children to protect themselves from intrusions into their personal space by shouting, seeking help, or moving to a safe location when needed, emphasizing that "children should respond by shouting, screaming, moving to a safe place, and seeking help from trusted adults." (MoNE, 2024a, p. 76). Teachers play a critical role in this process by introducing children to the concept of private body parts and explaining circumstances where exposure or contact is acceptable, such as "during medical examinations with a parent present." Additionally, through collaboration with school guidance services, children are supported in recognizing and responding to inappropriate behavior, "distinguishing between good and bad secrets" and understanding that "a good secret might involve something like a birthday surprise, while a bad secret involves someone saying not to talk about inappropriate touch." (MoNE, 2024a, p. 76). This proactive and structured approach reflects a comprehensive effort to address CSA prevention within ECE, highlighting the potential of centralized curricula to equip children with essential self-protection skills.

3.3. The Role of Educators and Institutional Support

The TCMM outlines a multi-disciplinary approach where early childhood teachers share responsibility for safety education. Teachers are tasked with introducing correct anatomical concepts and explaining appropriate contexts for physical contact, such as medical examinations performed in the presence of a parent. The involvement of school guidance services is highlighted as a strength that ensures a multidisciplinary and supportive network for the child. This centralized approach ensures that these self-protection skills are, in theory, delivered consistently to all children enrolled in formal education across Türkiye.

3.4. Interpretive SWOT Synthesis

The SWOT framework is used here as an interpretive synthesis rather than as an independent source of empirical findings. The categories below distinguish characteristics observable in the curriculum from contextual considerations derived from the literature.

3.4.1. Strengths

The first strength is the presence of explicit protective content. The curriculum includes bodily and personal-space awareness, identification of private body parts, distinctions between acceptable and unacceptable touch, self-protection strategies, help-seeking, and distinctions between good and bad secrets (MoNE, 2024a). These elements provide a substantive foundation upon which a more coherent prevention framework could be developed. A second strength is the developmental placement of explicit personal-safety content within ECE. The concentration of several relevant outcomes in the 60–72-month period provides an opportunity to introduce protective concepts during the preschool years. A third strength is the inclusion of educator and guidance-service roles. The curriculum recognizes that children's safety education requires adult involvement rather than relying

exclusively on children's individual responses. Finally, the national character of the curriculum provides substantial potential reach. A common national framework can provide a shared baseline for educational expectations, although the present study does not evaluate whether that baseline is implemented consistently across schools.

3.4.2. Weaknesses

The principal curriculum-level weakness identified in the analysis is fragmentation. Relevant concepts are present, but they are not consistently organized as an explicit CSA-prevention framework. The curriculum therefore provides protective components without clearly articulating the conceptual relationships among bodily autonomy, private body parts, inappropriate touch, secrecy, disclosure, and help-seeking. A related weakness is under-specification. The curriculum provides important learning outcomes but gives less explicit indication of how these concepts should be sequenced developmentally and integrated across the ECE curriculum. The absence of a clearly articulated prevention framework does not mean that prevention content is absent; rather, it leaves its organization and pedagogical integration less visible. A further weakness concerns the distinction between general values and child-protection concepts. Values such as respect and responsibility can support safe interpersonal relationships, but they do not substitute for explicit child-protection education. A stronger curriculum could make clearer how broad values connect to concrete protective knowledge.

3.4.3. Opportunities

The existing protective content provides a foundation for further curriculum development. Rather than introducing CSA prevention as an entirely new area, curriculum developers could strengthen the connections among concepts already present in the TCMM. Body awareness, private body parts, personal space, touch, secrecy, help-seeking, and trusted adults could be organized into a more explicit developmental progression. Teacher education represents another opportunity. Because the curriculum already assigns educators a role in addressing sensitive safety concepts, teacher-preparation programs could use the existing learning outcomes as a basis for developing pedagogical knowledge and communication skills. This recommendation is an implication of the documentary findings and relevant literature, not an empirical finding about current teacher competence.

The national structure of the curriculum also creates an opportunity for consistency in curriculum design. A clearly articulated framework could establish common expectations while still allowing educators to use developmentally and culturally appropriate pedagogical approaches. Finally, the curriculum could be examined against established child-rights and violence-prevention principles, including the protection of children from abuse under the Convention on the Rights of the Child and the emphasis placed by WHO on school-based violence prevention (UNICEF, 1989; WHO, 2019).

3.4.4. Threats

The principal threats identified here are contextual rather than direct findings of the curriculum analysis. Research has documented challenges associated with discussing CSA and implementing prevention programs, including professional training needs and social sensitivities (Allen et al., 2020; Lu et al., 2022; Dolunay-Cug, 2022). Such factors may affect how curriculum content is interpreted and enacted, but their specific influence on TCMM implementation cannot be established from the present dataset. A second contextual concern is the possibility that a fragmented curriculum may place greater interpretive responsibility on educators. Where a national framework contains individual protective concepts without clearly connecting them, implementation may depend on how educators understand and integrate those concepts. Again, this is a plausible implication rather than an empirical finding about current practice.

4. Discussion

The TCMM exhibits a pedagogical silence through its null curriculum, where the omission of explicit, anatomically correct terminology creates a systemic barrier for teacher candidates attempting to facilitate protective action. The findings of this study underscore the potential of Türkiye's centralized TCMM ECE curriculum as a framework for addressing CSA prevention. However, critical gaps remain that challenge the curriculum's effectiveness. While the inclusion of themes such as bodily autonomy and personal boundaries aligns with global best practices (Wurtele, 2009; Kenny & Wurtele, 2016), these efforts are insufficiently integrated into a broader cultural and structural context that actively resists open discussions on CSA due to entrenched taboos and stigmas (Lu et al., 2022; Katzenstein & Fontes, 2017).

A notable strength of the TCMM lies in its nationwide applicability, which ensures consistent messaging and equal access to educational resources across diverse socio-economic contexts (MoNE, 2024b). However, the centralized approach's rigidity limits its adaptability to regional and cultural nuances, a shortcoming noted in other centralized systems (Feiger, 2024). The macrosystemic rigidity of Türkiye's centralized framework presents a unique professional dilemma: it provides unparalleled reach for child protection while simultaneously restricting the localized autonomy necessary for culturally responsive CSA prevention. This macrosystemic rigidity directly impacts the teacher's microsystem by forcing a state of 'barrier competency' failure. When the centralized macrosystem utilizes 'abstract moral language' instead of concrete safety terminology, it creates a null curriculum that leaves the individual teacher without the linguistic tools necessary to facilitate a disclosure. Consequently, the teacher, as the primary agent in the child's microsystem, is structurally inhibited from moving from 'moralizing' to 'acting,' effectively turning a systemic policy gap into an individual professional failure. Teachers, who play a pivotal role in delivering CSA prevention education, often lack adequate training and confidence to address sensitive topics (Allen et al., 2020; Dolunay-Cug, 2022), which may dilute the program's intended impact. Scholars (Brunborg et al., 2024; Wilson & Lee, 2021) found that ECE professionals with more years of experience were associated with lower barrier competencies, likely because experienced staff have dealt with more maltreatment cases and reporting processes. There is a critical deficit in barrier competencies among educators, requiring teacher preparation programs to move beyond abstract moralizing and toward the development of concrete, high-stakes communication expertise. It is suggested that experienced staff be encouraged to share their insights with less experienced colleagues (Brunborg et al., 2024) and that periodic training be provided for all teachers to help refresh and improve competencies. Additionally, the absence of explicit directives for parental involvement neglects a critical component of comprehensive CSA prevention, as parents are instrumental in reinforcing these concepts at home (Rudolph & Zimmer-Gembeck, 2018). Systemic issues compound these challenges. The absence of publicly available CSA statistics in Türkiye (Berkmen & Seçim, 2019) reflects a broader unwillingness to confront the problem comprehensively, fostering a reactive rather than proactive approach. Cultural resistance, rooted in patriarchal norms that silence victims and shield perpetrators, further undermines these efforts (Güler, 2022; Jones, 2024). Without addressing these systemic barriers, CSA prevention efforts risk being reduced to symbolic gestures, lacking the depth needed for meaningful societal change.

Although the curriculum emphasizes personal safety strategies for children, it insufficiently addresses broader systemic factors contributing to CSA's prevalence. This limited scope becomes even more apparent when compared with international practices. Internationally, several ECE systems adopt more explicit, structured approaches to CSA prevention. Australia's protective

behaviors curriculum (Sims et al., 2024; Walsh et al., 2013), for instance, teaches children practical strategies to recognize unsafe situations and seek help confidently. Similarly, Scandinavian ECE models prioritize children's exploration, curiosity, and respect for individuality (Kunnskapsdepartementet, 2017; Lehn & Chahboun, 2025). In contrast, TCMM tends to rely on abstract or moral language, with limited direct references to abuse or protective action, which may hinder children's ability to internalize and act on these concepts. This omission aligns with critiques that preventive education often neglects the macro-level influences of power dynamics and cultural stigmas (Bronfenbrenner, 1979; Zeuthen & Hagelskjær, 2013).

5. Conclusion and Recommendations

Survivors often report lacking the language, awareness, or confidence to disclose abuse when they were children, highlighting the critical role ECE can play in equipping young children with tools for self-protection. This study highlights both the potential and the limitations of Türkiye's centralized ECE curriculum in addressing CSA prevention. While the curriculum includes important elements, its implementation is hindered by systemic challenges. These findings echo with broader concerns about the effectiveness of school-based CSA prevention programs in contexts where cultural taboos and stigmas persist.

To overcome these challenges, it is essential to invest in comprehensive teacher training programs that build confidence and expertise, ensuring educators are equipped to handle sensitive topics effectively. Integrating parents into the prevention framework through structured workshops and resources can also help reinforce key concepts at home, creating a consistent and supportive environment for children. Beyond general policy reforms, which include the mandatory integration of CSA prevention as a core curriculum element, teacher educators in higher education settings can adopt specific pedagogical strategies to prepare the next generation of practitioners. We propose a transformative pedagogical model that empowers teacher candidates to act as active agents of protection by critically auditing national frameworks to identify and fill systemic safety gaps. To build barrier competencies, educators can facilitate role-playing exercises where candidates use the curriculum's specific body autonomy outcomes to practice responding to bad secrets or parent inquiries. This pedagogical practice allows candidates to bridge the theoretical gap by applying Bronfenbrenner's Ecological Systems Theory as they analyze how they, as teachers in the microsystem, can bridge the critical gaps created by the macrosystem of centralized policy. Such an approach ensures that future teachers are not merely passive recipients of a centralized model but are active agents of child protection.

6. Declarations

6.1. Conflict of interest

The author declares that there is no conflict of interest to disclose.

6.2. Funding

The author declares that the study received no external funding.

6.3. Author contributions (CRediT)

Ceyda Durmus: Conceptualization; Methodology; Formal analysis; Investigation; Writing—original draft; Writing—review & editing

6.4. Data availability statement

This study involved only publicly available data: Ministry of National Education [MoNE]. (2024). *Early childhood education curriculum*. <https://tymm.meb.gov.tr/upload/program/2024programokuloncesiOnayli.pdf>

6.5. Ethics approval

The author declares that this study did not require ethics committee approval. The research was conducted in full accordance with applicable ethical standards and principles. This study involved only publicly available data (MoNE, 2024a).

6.6. Use of artificial intelligence (AI) tools

In accordance with COPE (Committee on Publication Ethics) core practices and the journal's guidelines, an AI tool (ChatGPT 4.0) was used during the final preparation of this manuscript. The tool's involvement was confined exclusively to basic linguistic refinement, structural formatting assistance, and grammatical optimization to enhance clarity. The generative model was not used to initiate original research, formulate conceptual deductions, analyze visual spreads, or synthesize qualitative findings. The author remains entirely accountable for the integrity, accuracy, and original analysis presented herein.

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What's on the shelf? A subject-based collection analysis of children's books in Ankara Public Libraries

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ABSTRACT

Children have certain fundamental rights, including access to health, education, and social services. One of the social services provided to children is access to libraries specifically designed for them. Libraries are available to all children without cost and provide equal opportunities to use their resources. Therefore, it is essential to examine the qualities and content of the resources that libraries provide for children. This research aims to examine preschool picture books in the children's sections of children's libraries and local public libraries in Ankara according to their types. This descriptive study design, the study utilizes document analysis. In the children's sections of six children's libraries in Ankara, 6,031 picture books aimed at preschoolers constitute the sample group. The study showed that Modern Fantasy and Realistic Fiction comprised 84.53% of the 6,031 children's books examined, while the remaining 15.47% fell into nine other categories. Children must get to know and interact with a variety of literature. Therefore, it is recommended that children's libraries diversify the types of children's books. Existing studies indicate a lack of research on suitable preschool book types available in public libraries. Understanding book categories is particularly important for librarians to effectively guide children and families using libraries. Consequently, subsequent research should design descriptive and intervention studies, while fostering collaboration among educators, librarians, and scholars to enhance library accessibility and inclusiveness.

KEYWORDS: Children's libraries; Children's library collection; Children's picture books; Children's picture book types

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1. Introduction

Every child grows and develops in accordance with their culture, environment, family structure, developmental pace, personality, and character. The United Nations Convention on the Rights of the Child (1989) states that all children, regardless of age, race, gender, religion, national and cultural background, language, social status, or personal abilities, have the right to free and equitable access to materials that support their full development. Similarly, Article 26 of the Universal Declaration of Human Rights emphasizes the right of every individual to education and the obligation of states to ensure equal access despite differences (United Nations, 1948). Based on these international agreements, it is acknowledged that all children are born with equal rights and should benefit from

state-provided equitable services that support their well-being, including health, safety, education, and social services. Libraries, as part of social services, are inclusive environments designed to support children's development. According to the Regulation on Public and Children's Libraries (1982), children's sections and, when necessary, separate children's libraries are established within public libraries to support the intellectual and emotional development of children up to the age of 16 and to encourage voluntary learning aligned with national values.

In the literature on children's libraries, Cengiz (2006) highlights that these libraries provide the most effective environment for introducing young individuals to literary works. Children's libraries play a crucial role in education by fostering reading habits and nurturing a lifelong love of reading (Kınalı, 1955; Yılmaz, 2008). According to Yılmaz (2000), individuals who develop habits of reading and library use tend to have richer, healthier, and stronger personalities. Engaging with libraries and reading supports both the individual and social development of children. Libraries share the power of literature and books with children, which not only stimulates their imagination but also makes the knowledge gained more lasting by connecting it to their lives (Conner, 1990). Based on this literature, it can be concluded that children's libraries are among the most suitable spaces for introducing children to books, reading culture, and education. Therefore, the quality and content of a library's collection serve as important indicators of the extent to which children benefit from the library.

The final report of the Children's Libraries Workshop held in 2018 highlighted that library facilities and collections should support the holistic development of children (General Directorate of Libraries and Publications [KYGM], 2018). The types of books children are exposed to, through which they develop a reading culture, are especially important. Library collections contribute not only to children's language development but also to their social and cognitive growth. According to the Children's Libraries Service Principles, materials and activities in children's libraries should cover a broad and diverse range (International Federation of Library Associations and Institutions [IFLA], 2003). This diversity is essential to uphold the principle of equal opportunity within the social context. The books children first encounter in their environment play a significant role in shaping their overall development. Additionally, literature is recognized as a valuable tool for resolving internal conflicts, facilitating socialization, and fostering creative thinking (Gönen, 1984). Therefore, careful selection of children's literature for library collections is crucial.

1.1. Early Language Development and Children's Books

Language development progresses rapidly, especially between birth and age three, and the literature frequently emphasizes the importance of introducing children to books during this period to support their language growth (American Academy of Pediatrics, 2014; Neuman & Wright, 2019). Numerous studies have demonstrated a strong relationship between the vocabulary used by adults interacting with children and the children's language development (Bus & Van IJzendoorn, 1995; DeBaryshe, 1993; Hoff, 2018; Logan, Justice, & Piasta, 2019; Mol et al., 2008; Neuman & Wright, 2019; Payne et al., 1994; Whitehurst et al., 1988). In particular, the shared reading experiences between parents or teachers and children are highlighted as critical factors in new vocabulary acquisition and, consequently, the development of language skills (Dickinson et al., 2019; Raikes et al., 2006; Seçim & Gönen, 2022; Seçim & Gönen, 2026; Sénéchal & Cornell, 1993; Toub et al., 2018; Xu et al., 2014). Moreover, reading picture books with children fosters print awareness, playing an essential role in early literacy development (Zucker et al., 2009). Research addressing the influence of socioeconomic status underlines the necessity of access to quality books for all children. Therefore, public libraries represent a crucial resource for early access to books (Clark Hunt, 2020).

Children's books are works that contain elements appealing to children's interests and imagination and consist of both text and illustrations (Cianciolo, 1997). Picture books positively influence preschool children's motivation and interest in reading, while also significantly contributing to the development of early literacy skills (Adams, 1990; Lonigan, 1994; Wells, 1985). Introducing children to the enjoyable aspects of books is among the most important ways to provide a positive start in life. Picture books nurture children's curiosity and imagination, support the development of new ideas, and encourage diverse perspectives on the world, thereby fostering cognitive, social, and language development. Early access to books is essential for children to broaden their horizons, deepen their understanding, and enhance their social awareness (Gönen & Veziroğlu, 2015). Additionally, books serve as a means of transmitting knowledge beyond the constraints of time and space. Considering that every piece of information within a book contributes to shaping the child's identity, book selection should be carefully aligned with the child's needs and developmental stage to enhance engagement. Introducing books during infancy can contribute multidimensionally to a child's development. Recognizing the types of children's books suitable for the 0–6 age group is vital to matching children with books appropriate to their developmental characteristics (Ural, 2015). Picture books used at an early age not only cultivate a love of reading but also support learning. For this reason, the quality of books children read in early childhood is of great importance (Çakmak & Yılmaz, 2009; Hakkoymaz & Tanju Aslışen, 2022). The principle of child appropriateness, which ensures access to quality works, is defined by Şirin (1994) as the suitability of books to children's growth and developmental periods, psychological state, vocabulary, concept knowledge, and level of comprehension. Therefore, selecting the right book at the right time is fundamental. Knowing which types of books to introduce according to a child's developmental characteristics helps maintain their interest in reading.

A review of the related literature reveals that picture books in early childhood are categorized and classified according to age groups, physical and content features, and literary genres. Within this framework, picture books in the present study have been examined under eleven subcategories, as identified in previous research (Cianciolo, 1997; Gönen, 1984; Hillman, 1995; Kiefer et al., 1998; Temple et al., 1998; Ural, 2015).

1.1.1. Poetry Books

Historically, poetry in children's literature has been employed to impart moral lessons, encourage desired behaviors, and provide educational guidance. Poetry serves to raise children's awareness of the harmony created by words and to demonstrate alternative ways of expressing their thoughts. It also functions as a medium to convey targeted learning outcomes through a distinctive literary form (Tanju, 2015).

1.1.2. Board Books for Infants

Board books are designed simply, visually engaging, and produced from durable materials specifically for children aged 0 to 2 years. These books are structured to withstand rough handling and are safe if mouthed by infants (Kiefer et al., 1998). Typically made from cloth or washable materials, they pose no health risks when placed in the mouth. The pages are thick, sometimes as sturdy as cardboard, preventing physical damage by the child. Furthermore, they lack small detachable parts that could present choking hazards, thus ensuring the child's safety.

1.1.3. Interactive Books

Interactive books require children's verbal or physical participation during reading activities. Features such as flaps, doors, or movable figures on the pages engage children actively in the reading and

exploration process. These characteristics make interactive books particularly appealing and promote children's involvement in literacy experiences (Kiefer et al., 1998).

1.1.4. Toy Books

Toy books are an important category in early childhood for introducing infants to books. These books resemble toys, often with thick cardboard pages, cut-out shapes, and tactile elements such as feathers or fabric, supporting fine motor development and sensory engagement. Some toy books include sound buttons that enhance auditory awareness (Ural, 2015). Cloth and bath books are especially significant for infants unfamiliar with book handling, as they foster book awareness without risk of damage. Bath books, made from waterproof materials, facilitate book interaction during bathing routines. Through exposure to images of animals, vehicles, and actions, toy books contribute substantially to language development (Yükselen, 2015).

1.1.5. Concept Books

Concept books aim to support the development of cognitive understanding by introducing basic concepts such as colors, shapes, numbers, seasons, distance, and time. These books typically feature simple illustrations and single words to promote skills like sequencing and matching (Ural, 2015). Conceptual development in children progresses from concrete to abstract, with children beginning to acquire concepts between ages one and two and further advancing this ability around age four. Attention to the attributes of objects and events is crucial in concept formation (Üstün & Akman, 2003). Concept books assist children in building a conceptual framework based on their surroundings.

1.1.6. Wordless Books (Silent Books)

Also known as wordless books, wordless books consist primarily of illustrations with little or no text (Hillman, 1995). The author conveys a narrative through images, inviting children to interpret the story independently. These books introduce children to various themes and successfully engage their curiosity, encouraging emergent reading skills even before they can read text (Lukens, 1999).

1.1.7. Folk Tales and Religiously Themed Books

These books typically feature narratives where good triumphs over evil, often incorporating humor and moral lessons. Through these stories, children gain insight into the history, beliefs, and lifestyles of their own and other cultural groups. Didactic in nature, these books frequently include heroic tales that captivate children's attention (Kiefer et al., 1998).

1.1.8. Modern Fantasy Books

The fantasy genre includes books in which at least one element, whether character, setting, or event, is impossible in real life. Fantasy books enrich children's imagination and remove mental barriers, fostering limitless creativity. By presenting unreal scenarios, they also capture children's attention effectively, encouraging them to think beyond reality (Kiefer et al., 1998).

1.1.9. Realistic Fiction Books

Realistic fiction excludes extraordinary or unreal events, characters, and situations. Instead, it depicts plausible life experiences such as shopping, hospital visits, vacations, divorce, school anxiety, or toilet training. These books help children gain insight into situations they may not have encountered firsthand, supporting adaptation to daily life and normalizing challenging experiences by showing them within a narrative context (Kiefer et al., 1998).

1.1.10. Biographical Books

Biographies written for children portray the lives and achievements of renowned figures in literature, art, politics, and other fields. These works aim to provide role models, inspire courage, and instill

patriotism by showcasing individuals who have contributed significantly to society and the world. Such narratives can stimulate children's imagination and help them form personal aspirations at an appropriate developmental stage (Tanju, 2015).

1.1.11. Multicultural and International Books

These books introduce children to both micro and macro cultural perspectives, fostering understanding of their own culture as well as others. Often published in multiple languages, they provide children with exposure to diverse linguistic and cultural features. Multicultural books positively contribute to emergent literacy skills, particularly print awareness, understanding the form, function, and directionality of writing (Justice & Ezell, 2001). By observing different alphabets and writing systems, children recognize that writing varies across languages, enhancing their cultural and literacy awareness (Kiefer et al., 1998).

A review of the relevant literature reveals that studies on preschool picture books predominantly focus on aspects such as content characteristics, illustration techniques, and physical features (Gönen et al., 2011; Gönen et al., 2016; Turan & Ulutaş, 2016; Yıldız et al., 2016), educational qualities (Yazıcı et al., 2018), and readability (Çeçen & Aydemir, 2011). However, only a limited number of these studies include samples drawn from public libraries (Çapçı & Durmuşoğlu, 2020; Sarı, 2019). In contrast, recent years have seen an increase in the number of studies related to children's libraries.

Although there is a scarcity of research specifically examining the genres of picture books for children, studies addressing children's books often mention book genres. For example, in Yükselen et al., (2016) explored preschool educators' criteria for book selection, genres such as biography, fairy tale, poetry, science education, and story were identified. The study found that teachers tended to read stories and fairy tale books more frequently in their classrooms among the options provided. Similarly, Turan and Ulutaş (2016) investigated the characteristics of picture storybooks in preschool institutions and teachers' usage of these books. Their study classified book types in book centers as picture storybooks, fairy tales, concept books, coloring books, comics, reference books, theater books, and others (e.g., magazines, brochures, catalogs), with picture storybooks being the most prevalent. Notably, the range of book genres represented in these studies remains limited. Additionally, Hakkoymaz (2022) analyzed 30 picture books affecting children's epistemological development by types of information presented, concluding that scientific knowledge was the most common, whereas religious and philosophical knowledge appeared the least.

A review of the literature indicates that there is no existing study examining the types of preschool picture books available in public libraries. Preschool picture books serve as important tools for supporting children's diverse developmental domains. Considering the impact of early exposure to books from infancy on later stages of development, it is essential to determine which book types are appropriate for specific age groups and to classify these types properly in public libraries to facilitate accessibility for children and their families. For instance, infant books may be suitable during the first months and years; toy and interactive books can enhance children's engagement with books; concept books aid vocabulary acquisition; wordless books foster creativity; poetry books raise awareness of literary genres; modern fantasy and folk tales develop imagination; realistic fiction and biographies help children relate to real life and provide role models; and multicultural books offer opportunities to explore diverse cultures. Therefore, it is necessary to first identify the distribution of these book types in public library collections serving preschool children.

This study is significant in that it examines the entirety of accessible preschool collections in six children's libraries located in Ankara. The findings will provide valuable insights not only for specialists in early childhood education but also for librarians. Children's libraries represent a

multidisciplinary field that requires collaboration between librarians and early childhood experts (Yılmaz, 2009). Accordingly, this study aims to serve as a guide for librarians, early childhood professionals, and families with preschool children regarding the collections of children's libraries in Ankara.

The subcategories of preschool picture books examined in this study were determined by reviewing various sources (Cianciolo, 1997; Gönen, 1984; Hillman, 1995; Kiefer et al., 1998; Ural, 2015) and consolidated into eleven categories by the researchers: Poetry Books, Infant Books, Interactive Books, Toy Books, Concept Books, Wordless Books, Folk Tales and Religious Books, Modern Fantasy Books, Realistic Fiction Books, Biographies, and Multicultural Books. Knowledge of these categories is particularly important for librarians to provide effective guidance to children and families utilizing the library. It is expected that this study will contribute to librarians' and early childhood educators' understanding of book genres and promote enrichment of children's sections in libraries based on these characteristics.

The research questions guiding this study are as follows:

1. Which preschool picture book genres are included in the children's book collections of Adnan Ötügen Provincial Public Library, Ali Dayı Children's Library, and the district public libraries of Altındağ, Mamak, Sincan, and Cebeci?
2. How is the distribution of preschool picture book genres characterized within the children's book collections of these libraries?

2. Method

2.1. Research Design

This study employed descriptive research design and utilized a document analysis method grounded in qualitative research tradition. Documents are defined as written or visual materials that exist prior to and during the research process (Patton, 1987). Document analysis involves the systematic examination of written materials relevant to the phenomena under investigation (Yıldırım & Şimşek, 2018). Documents are frequently used in qualitative research to complement and strengthen data, as they provide critical sources for tracking changes and developments over time (Bowen, 2009). Moreover, documents alone can constitute a complete data set for a study; the output derived from their analysis are sufficient to reveal the targeted phenomena (Bailey, 1994).

One of the primary reasons for employing documents in research is their positioning as actors that reflect social interactions and ways of life within a specific context. Considering their role in social life and action, documents are recognized as social products and, therefore, receive considerable attention in social research. Document analysis offers several advantages, such as low financial cost, the ability to collect extensive and detailed data, the potential for constructing retrospective narratives, ease of access, and the possibility to perform comparisons across countries, regions, and time periods. However, it also presents challenges, including difficulties in targeting specific content, potential lack of representativeness, unsuitability for examining individual attitudes, and limitations related to usability and access (Davie & Wyatt, 2022).

Bailey (1994) advocates that document analysis can be conducted through four steps: sampling, category formation, determining the unit of analysis, and quantification of data. In line with this, the first step (sampling) is detailed under the data set section, while the subsequent steps are explained within the data analysis section.

2.2. Data Set

The data set of this study consisted of 6,031 preschool picture books located in the children's sections of six public libraries in Ankara. Given the difficulty of accessing all relevant documents related to a research topic, researchers conducting document analysis typically establish a sample based on the available data (Bailey, 1994). Accordingly, criterion sampling, a purposive sampling method, was employed to form the data set (Yıldırım & Şimşek, 2018). The first criterion was that the books must target children aged 0 to 6 years, and the second criterion was that they had to be printed with children's books. Thus, non-printed materials aimed at this age group, as well as printed materials intended for children older than six, were excluded.

To ensure data diversity, libraries from various districts of Ankara were included: Adnan Ötügen Provincial Public Library, Altındağ District Public Library, Cebeci Public Library, Mamak District Public Library, and Sincan District Public Library. Among these, Ali Dayı Children's Library was the only dedicated children's library included.

2.3. Data Collection Instruments

The data set of this study consisted of 6,031 preschool picture books located in the children's sections of six libraries. Data collection was conducted between July 25 and August 3, 2019. Because libraries are dynamic environments where collections frequently change due to borrowing, returns, or new acquisitions, data collection focuses on books available for access during the study period. Depending on the size of each collection and with permission from library management, data was gathered during and outside regular working hours. The entire data collection process spanned 10 days. The children's collections of Ali Dayı Children's Library, Cebeci Public Library, and Adnan Ötügen Provincial Public Library were examined after regular hours with the required permissions, due to their extensive collections; these three libraries required seven full days of investigation by the researchers. The remaining libraries were each reviewed in one full working day.

In some libraries, preschool picture books were not separately classified within the children's sections, which prolonged the process as researchers had to identify relevant materials among all children's resources. To avoid omissions, the researchers also reviewed sections beyond the designated preschool range, including any books meeting the criteria. Books borrowed during the research period could not be included in the data set. To enhance intercoder reliability, two researchers collaborated throughout data collection, categorizing each book into one of eleven predefined types. The researchers worked concurrently during the coding process, and books coded differently were categorized following a joint review. To establish reliability, the level of agreement between the independent evaluators was calculated using the formula: $\text{Agreement Percentage} = (\text{Number of Agreements} / (\text{Number of Agreements} + \text{Number of Disagreements})) \times 100$. The resulting agreement coefficient was 0.92 (92%), indicating a high level of inter-rater reliability. According to Miles and Huberman (1994), an agreement rate of 80% or higher is considered acceptable for studies involving multiple coders.

2.4. Data Analysis

According to Bailey (1994), the analysis phase involves category creation, defining the unit of analysis, and quantifying the data. Prior to data collection, eleven picture book types were established based on the literature and were used as categories for analysis. The unit of analysis was the content of each book. Data were quantified using frequency counts and percentages. The collected books were first evaluated for their suitability for the preschool age group and then categorized according to their picture book type. The categories were: Poetry Books, Infant Books, Interactive Books, Toy Books,

Concept Books, Wordless Books, Folk Tales and Religious Books, Modern Fantasy Books, Realistic Fiction Books, Biographies, and Multicultural Books.

3. Findings

This section presents the findings organized according to the research questions. The first part addresses the types of books available in the libraries, while the second examines the distribution of these book types within the total collections. Frequency and percentages of the data are presented in tables. Table 1 illustrates the distribution of book types within each library's collection.

Table 1 *Number of books in the researched libraries*

Genre	Adnan Ötügen	Ali Dayı	Altındağ	Cebeci	Mamak	Sincan
Poetry	10	17	5	6	1	1
Infant Books	–	2	1	–	–	1
Interactive	10	21	2	16	5	3
Toy	2	1	2	–	1	–
Concept	43	1	3	34	8	10
Wordless	6	3	3	–	1	1
Folk Tales and Religious	87	140	44	86	4	37
Modern Fantasy	765	701	213	1032	230	213
Realistic Fiction	464	433	125	562	249	111
Biographies	36	36	22	17	4	15
Multicultural	32	22	6	59	3	6
Total	1455	1434	426	1812	506	398

Based on the examinations conducted in the children's section of Adnan Ötügen Public Library, it was observed that picture books are classified according to age groups. Among the 1,455 books categorized under "Preschool" analysis across 11 identified genres revealed that modern fantasy books ($n = 765$) constitute the largest portion. Notably, there was an absence of baby books designed for children aged 0–2 years.

Ali Dayı Children's Library stands out as the only dedicated children's library among those examined. Within the 1,434 books reviewed, samples from all 11 identified genres were present. Modern fantasy books comprised the largest share at 48.88% ($n = 701$). However, the presence of materials suitable for very young children was limited, with only one toy book ($n = 1$), two baby books ($n = 2$), and three wordless books ($n = 3$) found, indicating a lack of diversity in materials for early childhood.

Altındağ Public Library, the newest among the examined libraries, had 426 books in its children's section that included examples from the 11 genres. Analysis showed that modern fantasy books

accounted for half of the collection (50%, $n = 213$), making it the most represented genre. Baby books were the least represented genre, with only one example identified ($n = 1$).

Cebeci Public Library provided the largest dataset with 1,812 books examined in its children's section. No records were found for baby books, toy books, or wordless books in this collection. Modern fantasy books dominated 56.95% of the total ($n = 1,032$).

At Mamak Public Library's children's section, 506 books were reviewed, and no baby books were found. Realistic fiction books made up the largest proportion at 49.21% ($n = 249$). Single examples of poetry books, toy books, and wordless books were also identified ($n = 1$ for each).

According to data from Sincan Public Library, toy books were absent from the children's section. Modern fantasy was the most prevalent genre, accounting for 53.51% of the books ($n = 213$). Realistic fiction books followed at 27.88% ($n = 111$), with biography books in third place at 3.76% ($n = 15$).

Table 2 presents the total counts and distributions of book genres across the libraries examined. These findings highlight notable differences in genre diversity and age-appropriate materials within the collections.

Table 2 *Number of books in the researched libraries*

Genre	Number of books (n)	Percentage (%)
Poetry	40	0.66
Infant Books	4	0.06
Interactive	57	0.94
Toy	6	0.09
Concept	156	2.58
Wordless	14	0.23
Folk Tales and Religious	398	6.60
Modern Fantasy	3154	52.30
Realistic Fiction	1944	32.23
Biographies	130	2.15
Multicultural	128	2.12
Total	6031	100

The findings of the study indicate that the most prevalent genre across the library collections is modern fantasy, comprising 3,154 books and representing 52.30% of the total collection. This genre is followed by realistic fiction, which accounts for 1,944 books or 32.23% of the collection. Together, these two genres constitute 84.53% of the overall collection, highlighting their dominance within the libraries examined under 11 distinct categories.

Folk tales and religious books rank third in frequency, with 398 titles included in the collections. They are followed by concept books, which make up 2.58% of the collection ($n = 156$), biographical books at 2.15% ($n = 130$), multicultural books at 2.12% ($n = 128$), and interactive books at 0.94% ($n = 57$).

Genres represented by fewer than 50 books across the six libraries studied include poetry books at 0.66% ($n = 40$), wordless books at 0.23% ($n = 14$), toy books at 0.09% ($n = 6$), and baby books at 0.06% ($n = 4$). These findings reflect a significant concentration of the collections in a limited number of genres, while other categories remain minimally represented.

4. Discussion and Conclusion

Based on data obtained from six public libraries in Ankara, a total of 6,031 illustrated children's books classified into 11 genres identified in the literature were examined. The results of the study reveal two primary structural patterns. First, among the six libraries analyzed, the children's sections of Cebeci Public Library, Adnan Ötügen Public Library, and Ali Dayı Children's Library ranked as the top three in terms of the number of children's books, collectively housing 78% of the total collection. The remaining 22% was distributed across the children's sections of the other three libraries. Second, 84.53% of the 6,031 children's books in these libraries fall under only two categories: modern fantasy and realistic fiction, whereas the remaining nine genres constitute merely 15.47% of the collection. These two structural findings frame the detailed discussion presented below.

A clear imbalance in the number of children's books among the libraries is evident. According to data from the Directorate General of Libraries and Publications, Statistics and Data Analysis Department, in 2021, the children's section of Altındağ District Public Library had 2,135 registered members, served 2,679 users, and lent 3,743 materials. Sincan District Public Library's children's section had 3,653 members, served 5,997 users, and lent 4,527 materials. Mamak District Public Library reported 812 members and approximately 1,000 lent materials in 2020. In contrast, libraries with larger collections demonstrated higher usage: Adnan Ötügen Public Library's children's section had 5,845 members, lent 10,343 materials, and served 5,118 users; Ali Dayı Children's Library had 1,626 members, lent approximately 2,384 materials, and served 1,308 users; and Cebeci Public Library's children's section had 715 members, lent 1,222 materials, and served 3,724 users. Considering the impact of the pandemic, these three libraries achieved a notably high reach among users. Following the opening of four new children's libraries in Ankara since 2021, public library statistics reveal a significant growth in user engagement, with annual visitors increasing from 10,356 in 2021 to 59,800 in 2025 (KYGM, 2025).

Beyond library data, demographic characteristics of the districts where these libraries are located were examined. The proportion of children aged 0–14 years, which corresponds to the primary audience of children's libraries, varies across districts: 14.7% ($n = 136,106$) in Çankaya, 22.87% ($n = 90,618$) in Altındağ, 21.76% ($n = 145,686$) in Mamak, and 24.05% ($n = 132,050$) in Sincan. Socioeconomic status also differs significantly: Çankaya predominantly consists of high and middle socioeconomic levels, whereas Altındağ, Mamak, and Sincan are characterized mainly by middle and low socioeconomic levels (Endeksa, 2025). The existing disparities in child population density and socioeconomic status across these districts highlight the importance of expanding early-age library services as a means to promote equal opportunity.

In this context, it is imperative for policymakers and administrators to undertake initiatives aimed at increasing the number of children's books within the collections of the three libraries with higher usage and more extensive collections. Such efforts would contribute to equitable access to library resources and foster early childhood literacy and development across diverse communities.

The development of library collections that adequately support children's developmental levels and interests is anticipated to increase library use among families and children. Supporting this expectation, research examining the relationship between public libraries' expenditures and resources and the usage patterns of children and young adults found that most expenditure and resource variables were significantly associated with library use by these age groups across libraries of all sizes (Joo & Cahill, 2019). In Turkey, the rate at which children are introduced to libraries at an early age remains notably low. For instance, in a study conducted by Cevher (2015) aiming to determine the role of children's sections in public libraries in Ankara in fostering reading habits, only 12.2% (n = 24) of participating children reported attending the library for the first time during their preschool years. With targeted improvements, an increase in early-age library usage is expected in the coming years.

According to data obtained from the Ankara Provincial Directorate of Migration Management (2023), foreigners residing in Ankara with residence permits constitute approximately 1.5% of the total population. Altındağ district hosts the highest concentration of migrants under temporary protection (Savran & Sat, 2019). However, the multicultural book category at Altındağ District Public Library contains only six titles, indicating a pressing need to expand this collection. To ensure equitable access to libraries for all children and to support the development of foreign children, the number of multicultural and international books in libraries should be increased.

Regarding the distribution of book genres, modern fantasy emerges as the most prevalent type in children's libraries, constituting 52% of all books across libraries. This genre is considered significant in fostering children's imagination and creativity, and its abundance in children's libraries is a positive indicator. Prior studies reveal that children predominantly borrow books within the modern fantasy genre. Additionally, messages conveyed in modern fantasy books are clearly understood by children, the reading load is manageable, and these books support children's imaginative faculties (Sabarina et al., 2018). Fantasy books enable children to envision new, different, and alternative life scenarios, permitting them to undertake journeys not possible in real life, which in turn supports their development as more creative and imaginative individuals (Kiefer et al., 1998).

With 1,944 titles, realistic fiction ranks second among the 6,031 books examined. This genre is important in helping children encounter examples related to real life and in developing problem-solving skills. Through realistic fiction, children gain insight into resolving problems they may face in daily life, thus providing them with opportunities to acquire real-life experiences via literature.

Books such as folk tales and religious stories, which help children better understand their culture, rank third in terms of quantity. However, books representing different cultures and available in different languages constitute a relatively low proportion (2.12%). Another notable finding is the scarcity of interactive books designed to strengthen children's engagement with books and enhance their cognitive levels. The high market prices of interactive books limit children's access to them. Therefore, the limited number of interactive books (only 57 among 6,031 books) in libraries highlights the need for an increase in their quantity. Similarly, wordless picture books, which contain only images and support children's expressive language, creativity, and imagination (Lysaker & Miller, 2013), are underrepresented, with only 14 titles found, indicating that their numbers should also be increased.

Statistics generally show that preschool books primarily target children aged 4 to 6 years. The number of books suited for children aged 0 to 3 years, such as toy books, baby books, and concept books, does not exceed 3%, which reduces the inclusivity of library collections. There is a lack of clear data regarding book accessibility for children aged 0 to 3 in Türkiye. The higher cost of books for this age

group and families' potential lack of knowledge about early book access suggest a need for supportive mechanisms, appropriate physical conditions, and dedicated spaces for presenting suitable books in libraries (Veryeri Alaca & Küntay, 2019). In this regard, public libraries serve as crucial service areas for developing book collections and reading environments tailored to children aged 0 to 3.

Children's early exposure to books in life is closely related to their families' attitudes and the organization of the home environment (Whitehurst et al., 1994). Studies on early literacy development show that children from socioeconomically disadvantaged families are at greater risk of falling behind (Ergül et al., 2017). Therefore, making public libraries more functional for children and families is an effective way to bridge this gap. Research incorporating library visits demonstrates that the frequency of such visits is positively associated with early literacy development, particularly vocabulary growth (Sénéchal et al., 1996; Payne et al., 1994), and increases family participation in literacy activities (Xu et al., 2014).

The study conducted by Çakmak and Yılmaz (2009) with preschool children highlights the critical role of family, peer groups, teachers, and the broader environment in creating a reading environment and fostering readiness for reading. Libraries represent the most conducive setting where these elements converge. Early childhood library programs should be designed to benefit not only preschool children but also their families, educators, caregivers, and all stakeholders involved with libraries (Gönen et al., 2015). In programs targeting preschool children, it is essential to consider the appropriateness of books in terms of age and developmental characteristics, as well as their appeal to children's interests. This necessitates familiarity with different genres of children's literature and their appropriate use for specific topics.

4.1. Limitations and Recommendations

Knowledge of book genres and proper classification will enhance the quality of library use by families. It has been demonstrated that illustrations significantly influence the selection of books by preschool children and their families in public libraries. Parents who provided feedback on this matter reported difficulties in choosing appropriate books and noted that bibliographic information was often insufficient to guide their decisions (Svab & Zumer, 2015). Therefore, classifications based on book genres are expected to facilitate families' navigation toward books that align more closely with their children's interests and developmental stages.

One of the main limitations of library studies concerns the books that are borrowed. Due to the lack of separate data entry for preschool books in the library information system, it has not been possible to obtain information regarding the appropriateness of borrowed books for the preschool age group. Therefore, categorizing books that specifically target the preschool period both in libraries and in library systems would help organize the borrowing process more effectively. Additionally, families visiting the library often need guidance on selecting age-appropriate books for their children. To address this, library staff should first be informed about children's books and the age groups they serve and be supported in their professional development through undergraduate education and in-service training. Studies involving librarians are necessary to identify the areas where librarians, children, and families require support within the library environment and to plan necessary interventions accordingly.

According to IFLA (2006), libraries should offer qualified services for babies and children by including not only books but also educational materials such as toys, puzzles, Legos, and various musical instruments that address multiple developmental areas. Research conducted in libraries in Ankara

revealed that the diversity of materials was limited to books. Therefore, libraries should be enriched with a wider variety of materials.

Interdisciplinary collaboration should be increased to foster early childhood book appreciation, support development, and activate the library's capacity to fulfill these goals. It is anticipated that collaboration among educators, librarians, and scholars in relevant fields will enhance the accessibility and inclusiveness of libraries. Future research should design descriptive and intervention studies to investigate early childhood public library usage, given that these spaces offer particularly inclusive access.

This study is limited to six libraries located in Ankara. To obtain a clearer picture of the status of libraries nationwide, it is recommended that similar studies be conducted in different provinces across the country. Since the data presented were collected in 2019, subsequent research will be essential to tracking recent developments in the field of librarianship. Specific 2025 statistical details for public library children's sections were unobtainable.

5. Declarations

5.1. Conflict of interest

The authors declare that they have no known competing financial interests, institutional affiliations, or personal relationships that could have appeared to influence the work reported in this paper.

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Arif Yılmaz: Conceptualization; Methodology; Validation; Writing—review & editing; Supervision

Ela Sümeyye Seçim: Conceptualization; Methodology; Validation; Formal analysis; Investigation; Resources; Data curation; Writing—original draft; Writing—review & editing; Visualization; Supervision

Selvanur Çapçı: Conceptualization; Methodology; Validation; Formal analysis; Investigation; Resources; Data curation; Writing—original draft; Writing—review & editing; Visualization; Supervision

† These authors contributed equally to this work. All authors reviewed the results and approved the final version of the manuscript.

5.4. Data availability statement

Data are available from the corresponding author upon reasonable request.

5.5. Ethics approval

This study used document analysis only and involved only publicly available data; therefore, formal ethics committee approval was not required.

5.6. Use of artificial intelligence (AI) tools

No generative AI tools were used in the preparation of this manuscript.

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How successful is artificial intelligence as a playwright and dramaturg?

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ABSTRACT

The aim of this study is to examine the capabilities of artificial intelligence (AI) as both a playwright and a dramaturg by comparing AI-generated and human-written theatrical texts and dramaturgical interpretations. The study employs a qualitative research design using document analysis. Within the scope of the research, ChatGPT 5.1 generated a one-act play, *Tomorrow Is the Deadline*, which was analyzed dramaturgically by Dr. Amina Zhaman. In addition, Zhaman's play, *The Chaliapin O'Neill*, was analyzed by ChatGPT and DeepSeek using the same dramaturgical criteria. The data obtained were first analyzed in terms of the similarities and differences between the outputs provided by two different AI tools; subsequently, human- and AI-conducted dramaturgical analyses based on the same criteria were compared. The findings suggest that, although limited in scope, AI may be capable of functioning as a playwright and of producing dramaturgical analyses that were, in some respects, more detailed than the analysis produced by the human dramaturg in this study. While some shortcomings were identified in emotional and dramatic expression, the findings indicate that AI may serve as an effective dramaturg. Furthermore, the AI-generated play was not initially recognized as such by the human dramaturg and was evaluated as a human-written first draft, while the dramaturgical evaluation indicates that artificial intelligence may possess the capacity to succeed as a playwright. The study further suggests that human-AI collaboration could contribute to the development of higher-quality and more multidimensional productions in playwriting.

KEYWORDS: Artificial intelligence (AI); Dramaturgy; Playwright; Dramaturg; Theatre

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1. Introduction

Artificial intelligence (AI) has permeated every aspect of contemporary life and become an indispensable part of daily life. AI, widely used not only by Generation Z but by nearly every age group, has opened the doors to a new era by making its presence felt in numerous fields, ranging from art to academia, music to psychology, and digital game design to architecture. AI developed by humans saves time by providing quick access to information, thereby making individuals' lives easier in this respect.

AI, as a nonhuman entity, refers to the capacity of artificial systems to perform human-specific cognitive processes such as accessing, synthesizing, classifying, and evaluating information. Yüksel and Aşan Yüksel (2024) state that AI is capable of independent and original production and can offer

effective solutions. In this respect, the importance of AI in art is emphasized, and it is noted that by subverting traditional notions of art, it demonstrates a unique creativity in innovative creation and production processes (Yüksel and Aşan Yüksel 2024).

AI actively manifests itself in the creation of works of art, including the creation of paintings and sculptures, the composition of new musical pieces, and the creation of original performances. Furthermore, it is used in the analysis and criticism of works of art, enabling the examination of works according to structural, emotional, and other evaluative criteria (Yüksel and Aşan Yüksel 2024). The capacity of AI to perform certain information-processing tasks effectively and rapidly calls for a reassessment of its current role in art and suggests that collaboration between AI and humans may contribute to the evolution of artistic production. Yıldırım (2024) describes this process as a new and innovative era in which the relationship between art and machines and humans is undergoing a fundamental transformation. Furthermore, as Baboolall and Arora (2025) note, AI is not intended to replace or diminish human intelligence; rather, it functions as an assistive technology that contributes to production processes by offering a broad spectrum of creative possibilities. Among these auxiliary functions, emphasis is placed on fostering innovation in the creation and perception of art, as well as ensuring both ethical and effective collaboration regarding authorship, originality, and creativity. Chatterjee (2022, p. 8) has stated that this collaboration between humans and AI challenges the belief that humans are the sole and indispensable subjects in art, suggesting that AI with aesthetic sensitivity may prompt a reconsideration of the nature of art. Within theatre, these capacities can be considered through two functional roles: AI as a generator of dramatic texts, corresponding to playwriting, and AI as an interpreter of their structural, thematic, and performative dimensions, corresponding to dramaturgical analysis. This distinction provides the conceptual basis for examining whether generative AI can perform functions traditionally associated with playwrights and dramaturgs.

AI has begun to be used in the writing and production of plays, just as in many other areas of art. According to Azunwo (2013), a play is a literary work of art designed to convey emotions, ideas, experiences, and the like to an audience and to receive feedback from them. Writing and analyzing a play is a complex process that requires expertise. This writing process, carried out by humans, involves specific stages. Norden (2007) discusses the stages involved in playwriting, including constructing a compelling story, creating characters with distinct objectives within that story, establishing a solid dramatic structure, accurately capturing the rhythm of conflict, tension, and resolution, and organizing the dialogue in a way that flows naturally by selecting lines consistent with the characters' personalities. A playwright is the creator of a play who is responsible for developing and crafting a structured story as a written text to be performed on stage (Azunwo, 2013). Throughout this creative process, the playwright is responsible for crafting the play's dialogue, characters, and plot within a coherent thematic and contextual framework. The writing process, initiated by the playwright, is followed by the dramaturgy process, which involves evaluating the theatrical text in terms of its suitability for the stage, structural integrity, and its contextual consistency.

Dramaturgy is a field that examines a play from multiple perspectives; supports the play's development to ensure a better understanding of it and conducts contextual and formal analyses to improve the staging process (Azunwo, 2013). Dramaturgy concerns the comprehensive examination of a play from start to finish; encompassing a process in which every stage, from the text to the actors' characters, from the harmony of characters with one another and with the play to stage lighting and set design, from how the text and context reach the audience to the analysis of selected words and sentences, is examined and evaluated step by step in detail. Cardullo (2004) defines dramaturgy as

the ability to take on multiple roles simultaneously; he notes that a person can serve as both a playwright and a director while also functioning as a dramaturg who examines these two fields. Dramaturgy encompasses multiple categories, including lighting, staging, set design, acting, and style. In other words, it is everything (Poushpom, 2016). Poushpom (2016) articulates this through the concept of "mediation" due to its function of mediating between the stage and the audience, the play and the director, and the text and the performance, and defines dramaturgy as follows: "A dramaturge is a literary and artistic entity that acts as a mediator and or translator within a theatre or theatre company, assisting in the editing and sculpting process of a performance or text". In this context, it can be stated that dramaturgy focuses on numerous questions such as: "How was the theatrical text created?", "What theatrical tools were used?", "How was the audience affected by this performance?", "How was the performance related to the outside world?" and so on (Groot Nibbelink & Merx, 2021, p. 7).

A dramaturg conducts dramaturgical analysis and evaluation by examining a theatrical work comprehensively from multiple perspectives. In other words, a dramaturg can be described as someone who analyzes the stage design, lighting, and sound design; evaluates the coherence of the message intended for the audience; critiques the play from a director's perspective in terms of its structure and context; and examines the playtext within historical, period-specific, cultural, and linguistic contexts, assessing it from various angles. The dramaturg analyzes the dramatic structure and all its constituent elements to make them meaningful throughout the dramaturgical analysis of a play's text. In this process of interpretation, the dramaturg should pay attention to the consistency of various elements such as the play's relevance to its context, the harmony between the acting style and the text, and the relationship between the set design and the play, and ensure harmony within the dramatic structure (Poushpom, 2016). These characteristics demonstrate that dramaturgy is not merely a technical evaluation process but also a multidimensional interpretative practice. This complexity raises the question of whether such interpretative responsibilities can also be undertaken by artificial intelligence.

By collaborating with the dramaturg, director, and actors, and by examining and critiquing the theatre production from various perspectives, the dramaturg contributes to developing the production's vision. Additionally, the dramaturg adapts it to the current conditions by translating the playtext written in a different language. A dramaturg examines the script's alignment with the historical period and the author's ideology; to properly analyze the playtext, they also research the author's life, writings, the era in which they lived, and their culture (Azunwo, 2013). Azunwo defines the dramaturg as a "walking library" who examines the work contextually and historically.

There are certain general criteria to be considered in the dramaturgical analysis of a theatrical playtext. According to Azunwo (2023), these criteria include the holistic structure of the text, the depth of meaning in the theme, the developmental processes of the characters, the way conflict supports the dramatic meaning, and the linguistic style of expression. In the dramaturgical analysis of a play, it is examined from a developmental perspective from beginning to end; the playwright's unique writing style is evaluated, and the author's overall style is analyzed. All characters are examined in detail in terms of their backgrounds, linguistic accents, and speaking styles. If the play incorporates musical or auditory elements, these are also analyzed, and the element of conflict within the play is evaluated holistically.

The process of dramaturgical analysis, which can be described as a multifaceted process, has taken on a new dimension with today's technological advancements; considering the advanced functions of artificial intelligence and its position in art, whether AI could assume a role such as that of a

playwright or dramaturg has become a subject of debate. Today, artists also utilize AI in the processes of writing, producing, applying, criticizing, and evaluating works of art. The recent success of AI in producing remarkably effective and creative works necessitates, perhaps, a reconsideration of its role in the field of art, rather than its outright rejection. As a concrete example supporting this view, Ivanova (2025, p. 9) emphasizes that artificial intelligence's production in the field of art can yield formally and technically creative works, and that these works can be more innovative than traditional ones. In another research, AI has been assessed as a tool that enriches the creative process instead of replacing traditional art, and it has been stated that AI-supported art tools increase the possibilities for rapid idea generation and working with different sources by enabling detailed and creative experimentation (BS et al., 2025, p. 236). In the study titled "Designing Characters with AI: An Art and AI Learning Activity," in which characters and visuals were generated through interaction with artificial intelligence, it was emphasized that AI was found to be highly successful and innovative in terms of features such as character creation, providing personalized feedback, and story construction (Ali et al., 2025). Kaur and colleagues (2025, p. 385) noted that through AI tools, many people can produce art by using computers effectively.

In addition to supporting the production of art, AI also plays a role in evaluating and analyzing art. Lorusso, Colizzi, and Adamo (2023, p. 45) state that AI-based algorithms can assist researchers in analyzing works of art, thereby reducing human error, and can also be used in the historical, stylistic, contextual, and technical analysis of artworks, as well as in visual examinations. Considering these diverse roles and functions of AI in art, it seems plausible that AI could also effectively fulfill the role of a dramaturg in the dramaturgical analysis of playwriting, theatrical texts, and staging processes.

In this context, various studies have been conducted on the functionality of AI. The study by Kang and Lee (2025) aimed to enable actors to achieve greater creativity and spontaneity in improvisation and stage work, as well as to enhance actors' flexibility through AI-generated content, and demonstrated how artificial intelligence can support creative processes in the fields of theatre and acting. In another study, a system (CO-OPERA) was developed to demonstrate the effective and pedagogically appropriate use of AI to support drama and playwriting in educational settings (Ma et al., 2025). Ivanova (2025) examined the questions of whether AI-generated art truly constitutes art and how ethical objections to it might be evaluated. In a study conducted by Zeynalov (2025), the relationship between AI and theatre was examined, particularly in light of AR and VR technologies, with an emphasis on how the perception of reality is reshaped, in an effort to understand the potential of this field.

Based on the literature reviewed for this study, no research was identified that compares AI and humans in the context of both playwriting and dramaturgy, examining AI's capacity to both produce a play and analyze a play written by a human as a dramaturg. Addressing this gap is important because understanding AI's potential not only as a creative writing tool but also as an interpretative dramaturg contributes to current discussions on human-AI collaboration in theatre. Accordingly, this study examines, through selected theatrical texts, AI's capacity both to generate a play and to analyze a human-written play from a dramaturgical perspective. More specifically, it compares the dramaturgical evaluation of an AI-generated play by a human dramaturg with the analyses of a human-written play conducted by two AI systems using the same dramaturgical criteria.

2. Method

2.1. Design

This study employs a qualitative research design using comparative document analysis. Document analysis was selected because the primary data comprise written theatrical texts and written dramaturgical evaluations that require systematic examination and interpretation (Bowen, 2009). The data consist of one AI-generated play, one human-written play, and the written dramaturgical evaluations produced by one human dramaturg and two AI systems using the same criteria. Different generative AI systems may produce varying interpretations even when responding to the same text and analytical criteria; therefore, including ChatGPT and DeepSeek enabled an examination of whether the observed patterns were model-specific or shared across the two systems.

2.2. Documents

The documents of the study consist of two one-act plays. The first of these plays is human-written, titled *The Chaliapin O'Neill*, written by Dr. Amina Zhaman. The other is a play titled *Tomorrow is the Deadline!*, generated by AI (ChatGPT 5.1). These plays were included because their shared one-act comedy format enabled them to be examined using the same predetermined dramaturgical criteria.

The Chaliapin O'Neill is a one-act comedy inspired by a real historical event. The play, which runs for approximately one and a half hours, features dialogues and fictional scenes involving the main characters: American playwright Eugene O'Neill, Russian opera star Feodor Chaliapin, Chaliapin's wife Maria Petsold, and O'Neill's lover Carlotta Monterey. The plot revolves around O'Neill's desire to cast Chaliapin in the lead role of his play *Lazarus Laughed*, but the collaboration never materialized due to issues regarding fees, language, and artistic concerns. Set against the context of the 1920s art world, the play explores the unrealized dream of these two great artists with both humor and melancholy. The play concludes with O'Neill making peace with the ghost of Chaliapin, who appears in his imagination after Chaliapin's death; the two artists meet in spirit, sharing laughter, thereby emphasizing the immortality of art and the power of imagination.

Tomorrow is the Deadline! is a one-act comedy. The play's main characters include Emily, an idealistic playwright and graduate student; Daniel, the practical and efficient director of a cultural center; Olivia, a janitor and secret actress; James, an influencer-actor; and Sophia, a rule-bound municipal inspector. The play tells the story of a municipal cultural center in a medium-sized city in Anatolia that is required to stage "a quality play reflecting local culture" within a single day. In other words, it humorously portrays the effort to write and stage a play overnight, just before an inspector's audit scheduled for the following day. The play's contextual framework is built upon the bureaucratic and financial challenges faced by contemporary art institutions, the influence of social media, and the conflict between amateur spirit and professional concerns. While the characters strive to put on the play, they also reveal their personal goals and anxieties. Despite the mishaps on premier night, the cultural center avoids the threat of closure thanks to the genuine connection formed with the audience, and the play concludes by highlighting the unifying and transformative power of art.

2.3. Procedure

In the first phase of the research, the AI was first asked to write a play. For the writing of this play, ChatGPT version 5.1, one of the AI tools, was utilized, and the AI was asked to write a one-act comedy play based on its own creativity and originality, without drawing inspiration from any external sources. The aim of this phase was to examine the AI's capabilities in writing a play.

In the second phase, Dr. Amina Zhaman analyzed the AI-generated play, while ChatGPT and DeepSeek analyzed the human-written play using the same seven dramaturgical criteria. The researchers then compared these dramaturgical evaluations to identify similarities and differences between the human and AI-generated analyses.

The human dramaturgical analysis was conducted by Dr. Amina Zhaman, a playwright, stage director, and dramaturg with professional expertise in American theatre and theatrical text analysis. She was selected on the basis of this expertise. The nonhuman dramaturgical analysis of the research was conducted using ChatGPT and DeepSeek. Prior to the evaluation process, Zhaman was not informed that the play submitted for her evaluation was written by AI. This nondisclosure was intended to prevent prior knowledge of AI authorship from influencing her dramaturgical evaluation; it was not designed as a formal blinded authorship test. Once the evaluation process was completed, this information was shared with her in accordance with ethical principles, and her opinions were also obtained regarding the AI's playwright qualities, the stagability of the generated play, and its overall assessment.

In the dramaturgical evaluation of the plays included in this study, the following criteria, developed by Dr. Zhaman, a dramaturg, playwright, and expert in play analysis, were used.

1. Analyze the plot of the play and its development from the beginning until the end.
2. Find out more about the playwright's original style of writing.
3. Analyze all play's heroes and their backgrounds. If some heroes have real prototypes, find them. If the play is about famous people and they are presented under their own names, then research their lives and art in the exact period of the story.
4. Analyze characters' speech (accents, slangs).
5. Underline their actions.
6. Find the main conflict of the play.
7. Learn more about the play's soundtrack, if the playwright mentions exact songs, spirituals, opera arias etc.

3. Findings

The findings were examined at three comparative levels: the AI-generated and human-written plays, the human and AI dramaturgical analyses, and the dramaturgical analyses produced by ChatGPT and DeepSeek. Table 1 first presents the comparison between the human and AI dramaturgical analyses.

Table 1 Comparison of AI and human dramaturgical analysis approaches

Dramaturgical criterion	Human analysis	Nonhuman (AI) analysis
Analysis of the Plot and Its Development	Views the plot as engaging yet underdeveloped, with prematurely resolved conflict reducing dramatic intrigue.	Describes a thematically structured, non-linear development with a clearly articulated dramatic arc.
Playwright's Original Style of Writing	Highlights strong character goal clarity while noting limited dialogic depth and cultural specificity.	Characterises the style through structural hybridity, intertextual layering and balanced tonal modulation.
Character Analysis and Real Prototypes	Emphasizes creative development, character contrast and performative expansion of dramatic interaction.	Focuses on biographical fidelity and historically grounded the representations of real figures.

Dramaturgical criterion	Human analysis	Nonhuman (AI) analysis
Analysis of Characters' Speech	Identifies lacks of intrigue and realistic dialogues between the characters.	Differentiates speech through tone, stylistic register and rhetorical patterns.
Underlining Characters' Actions	Highlights performative self-presentation and limited dramatic interaction and focuses on words more than actions.	Frames actions through objective goals and narrative functions.
The Main Conflict of the Play	Frames the conflict as a potential administration-artist tension that is resolved before unfolding.	Defines the central conflict as a multi-layered clash between artistic idealism and practical reality.
Analysis of the Play's Soundtrack	Emphasizes that explicit soundtrack details support staging and performance atmosphere.	Identifies music as an integrated motif shaping emotional states and thematic transitions.

When the findings presented in Table 1 are evaluated separately in terms of dramaturgical analysis criteria:

Regarding the criterion of "Analysis of the Plot and Its Development" in the human analysis, it was emphasized that the play's plot was more of a rough draft in terms of plot structure and development, and criticized the play for needing a conclusion. In the AI analysis, a more analytical and descriptive evaluation was made by describing the existing structure.

Regarding the criterion of "Playwright's Original Style of Writing" in the human analysis, the text was described as "passive" and conveyed a more metaphorical message through the use of the "sleeping" metaphor. Additionally, a comparative and metaphorical analysis was presented by likening the AI's playwriting style to that of Tennessee Williams. In the AI analysis, however, terms such as "meta-theatre" were selected to provide a more terminological and categorical evaluation.

Regarding the criterion of "Character Analysis and Real Prototypes" in the human analysis, a potential-focused evaluation was conducted that identified shortcomings in the characters and suggested ways to improve them.

Regarding the criterion of "Analysis of Characters' Speech" in the human analysis, emphasis was placed on the spatial context, and the disconnection within this context was noted. In the human analysis, it was emphasized that the most impressive part of AI's playwriting process was the bridge it established with the characters, scenes, and character conflicts, describing it as a "playwright's laboratory".

Regarding the criterion of "Underlining Characters' Actions" in the human analysis, the lack of realistic dialogue and plot development was noted, along with a lack of interaction between characters; the characters' acting style was described using Andy Warhol's phrase "15 Minutes of Fame." In other words, the review criticized the characters for rushing to the climax. In the AI analysis, a more objective and automated evaluation was conducted and historical accuracy and function of the characters were focused on. Additionally, a functional linguistic analysis was performed, examining linguistic features such as practicality and irony.

Regarding the criterion of "The Main Conflict of the Play" in the human analysis, the focus was primarily on shortcomings, noting the lack of a genuine struggle and the fact that the issue was resolved before it even began. In the AI review, however, the conflict was analyzed in greater detail within a theoretical framework and across different levels.

Regarding the criterion of “Analysis of the Play's Soundtrack” in human analysis, the author’s qualities were praised, and a comparative analysis was provided, noting that the soundtrack selection was strong. In the AI analysis, however, the music’s dramaturgical function and its impact on the characters were addressed functionally.

In a nonhuman dramaturgical analysis of a play written by a human, it was observed that the analyses conducted by AI tools (ChatGPT and DeepSeek) generally yielded similar results, although some differences were noted on certain points. Both AI tools examined the play from a meta-theatrical perspective and found the play structurally strong, adhering to the prototypes of the characters. In addition, it was observed that while DeepSeek focused more on thematic structure and emotional transformation in its structural analysis of the play, ChatGPT adopted a traditional, scene-based analytical approach by focusing on structural clarity and practicality. While DeepSeek described the plot by supporting it with more specific examples, ChatGPT evaluated it from a more general and dramatic framework. In terms of style and language, it was observed that DeepSeek adopted a more poetic approach, whereas ChatGPT handled the academic and everyday language structures in a more rhythmic manner. It has been determined that while DeepSeek places greater emphasis on the psychological dimensions of the characters, ChatGPT more prominently highlights their historical and dramatic aspects. Despite these differences in detail, it has been observed that both AI tools generally produce similar dramaturgical results and offer comprehensive reports by analyzing all criteria of the play in detail.

This research reveals various similarities and differences between plays written by humans and AI. The findings suggest that AI demonstrates strengths in analytical and structural aspects of playwriting, while it may remain limited in conveying emotional depth and traditional dramaturgical qualities. The evaluation of Zhaman, a dramaturg with whom collaborated within the scope of the study, reveals that AI performs adequately in information processing and analytical structure building; however, it requires human contribution in terms of conveying emotion, feeling, and tradition. This parallelism further supports the findings from a dramaturgical perspective.

The play written by the human has been determined to possess a multi-layered, detailed, poetic, and intellectual structure. The human is highly successful in conveying the lived culture and its linguistic and social life into the play. Beyond straightforward and analytical playwriting, the human is far more effective in the use of language and context for the transmission of emotion and meaning. However, from the perspective of playwriting, it has been observed that AI falls relatively short in the emotional dimension characteristic of the human touch. It has been concluded that human playwrights significantly excel in terms of character dynamics, the chain of conflict, and detailed plot construction. Dramaturgical evaluations have revealed that the closing scene of the play written by a human is more impactful and striking. Based on these assessments, it is evident that human playwrights demonstrate clear advantages in terms of emotional depth, experience-based intuition, and the ability to construct multi-layered dramatic structures. On the other hand, although AI's capacity for structural production and text generation is strong, it appears unable to fully achieve the contextual and experiential integrity provided by human playwriting.

Despite these shortcomings, Dr. Zhaman evaluated AI as a playwright based on its similarities to some significant figures. This finding may be interpreted as suggesting that, although AI still requires human collaboration, it demonstrates the potential to contribute to playwriting.

In this study, Dr. Zhaman was not initially informed that the play had been written by an AI. Upon learning this information, she stated that she had assumed the play had been written by a human and had not harbored any suspicion. However, she also noted that she considered the play was to be a

first draft written by a talented playwright, which would be developed by gaining further depth. In this concern, the fact that a play written by AI was perceived as if it was written by a human and did not arouse any suspicion may indicate AI's potential to function as a playwright under certain conditions.

With regard to another objective of the study, the comparison of dramaturgical analyses conducted by humans and AI, it was observed that the same criteria were sometimes approached from different perspectives. In the human evaluations, a more subjective and constructive approach was exhibited, based on a critical perspective, including suggestions for development, and centering on the creative process. In contrast, it was determined that in the AI evaluations, the play was addressed by being categorized in line with theoretical and analytical frameworks; a more descriptive and objective evaluation was presented. The research concluded that while both human and AI evaluations conducted by dramaturgs were effective and of high quality, the AI evaluation was more detailed and analysis-based. It was observed that human dramaturgy focused more specifically on conveying emotions, while AI dramaturgy adopted a more realistic approach. Although the AI analysis was more detailed and comprehensive, it can be said that both types of analysis are of acceptable quality from a dramaturgical perspective. It was observed that AI produce a more superficial structure in playwriting, while humans adopted a more emotional, detailed, and compelling narrative; that AI, as a dramaturg, demonstrated a more meticulous and analytical approach, whereas the human dramaturg conducted a more superficial evaluation, yet one based on the transmission of emotion to the audience and real-life examples.

4. Discussion

The findings obtained within the scope of this study align to a certain extent with the discussions in the literature regarding the functionality of AI in playwriting and dramaturgical analysis processes. There are studies in the literature that question the use and capability of AI in the field of art. In the study conducted by Lorusso, Colizzi, and Adamo (2023), it was stated that while AI is not positioned as superior to human judgment and expertise, it can be considered an enabling force that enhances and complements human performance and capabilities, working in harmony with human abilities and even outperforming them in certain areas. This situation partially supports the results of this research. In this study, the AI-generated dramaturgical analyses were more detailed than the human analysis in several evaluation criteria; however, the findings also indicated that creative decision-making and contextual interpretation continued to depend on human expertise, while the human-written play demonstrated greater emotional, cultural, and dramatic depth. On the other hand, Ivanova's (2025) study emphasized that although there are some limitations in artworks produced by AI, they prompt the audience to think. In the current study, although the AI-generated play had certain limitations, its functionality at the analytical and structural levels suggests that these shortcomings could potentially be addressed through human–nonhuman collaboration.

Similarly, Kang and Lee (2025) reached the conclusion that, despite certain shortcomings and limitations, AI-assisted tools are capable of generating creative and unique scenarios more successfully than those written by humans. Their findings parallel the broader conclusion of the current study that AI can contribute to creative theatrical processes, although their research does not directly address dramaturgical analysis. However, the emotional and cultural limitations of artificial intelligence in playwriting differentiate the finding of this study. In their approach to fine arts education, BS et al. (2025) emphasized that integrating AI into art does not imply that it will replace humans; rather, it should be seen as a tool that assists humans, provides new avenues for critical analysis, and supports rapid idea generation. This perspective appears similar to the collaboration with AI in this study. The limitations observed in cultural depth, emotional transmission, and

contextual adaptation, together with the continuing importance of human contribution, are consistent with Ali et al.'s (2025) finding that AI-based character design requires cultural and linguistic adaptation. This finding can also be related to the assessment made by Zeynalov (2025) in his study on how the digital transformation in theatre, through the integration of AR and VR technologies, might affect the perception of reality, emphasizing that it opens up new areas of ethical and cultural debate.

4.1. Limitations

The findings of this study should be interpreted within the limitations of its research design. Since the study is based on two play texts, a single human evaluator, and specific AI systems, the findings should be regarded as exploratory rather than generalizable. The initial nondisclosure of the AI-generated play's source was not designed as a formal blind authorship test; therefore, the dramaturg's initial perception of the text was treated as a contextual qualitative observation. Furthermore, although the model was instructed not to draw inspiration from existing works, its training data and possible prior exposure to similar dramatic structures could not be controlled.

4.2. Implications and Recommendations

It is believed that future examines various types of play texts, staging processes, and performance practices using different AI tools, and conducts diverse analyses within the framework of various dramaturgical evaluation criteria, will contribute to a more comprehensive understanding of AI's role in the field of theatre. Future research may also examine the ethical, cultural, and labour-related implications of integrating AI into playwriting and dramaturgical practice, thereby contributing to a more balanced understanding of human-AI collaboration in theatre.

5. Conclusion

The findings indicate that AI can perform more detailed dramaturgical analyses than humans, whereas humans remain more successful in playwriting, particularly in creative decision-making and contextual interpretation. What distinguishes this study from others is that it examines AI's ability to write plays and conduct dramaturgical analysis by comparing its performance with that of humans. Although it is merely a comparative analysis based on two play scripts and an evaluator, it would not be inaccurate to suggest that it may open new doors for inquiries into AI's capabilities in the fields of art.

Although this research raises questions about how AI, as a playwright, might shape emotional and cultural perception, it also highlights the supportive role AI can play by producing rapid and structured analytical outputs. This situation indicates that developing new working models based on human-AI collaboration in theatrical production could be beneficial. At the same time, these findings should not be interpreted as suggesting that AI can replace the creative, cultural, or ethical responsibilities of playwrights and dramaturgs. Rather, they indicate that AI may function as a complementary tool whose outputs continue to require human interpretation, contextual judgment, and artistic responsibility.

6. Declarations

6.1. Conflict of interest

The authors declare that there is no conflict of interest to disclose.

6.2. Funding

The authors declare that the study received no external funding.

6.3. Author contributions (CRediT)

Müberra Buran: Conceptualization; Methodology; Validation; Formal analysis; Investigation; Resources; Data curation; Writing—original draft; Writing—review & editing; Project administration

Ömay Çokluk Bökeoğlu: Conceptualization; Methodology; Validation; Writing—review & editing; Supervision; Project administration

Şebnem Özdilek: Validation; Resources; Writing—review & editing; Project administration

All authors reviewed the results and approved the final version of the manuscript.

6.4. Data availability statement

Data are available from the corresponding author upon reasonable request.

6.5. Ethics approval

The authors declare that this study did not require ethics committee approval. The research was conducted in full accordance with applicable ethical standards and principles. Formal approval was not required, as the study involved only document analysis and no personal data collection.

6.6. Use of artificial intelligence (AI) tools

Generative AI tools, including ChatGPT and DeepSeek, were used as part of the research design for the generation and dramaturgical analysis of theatrical texts, as described in the Method section.

6.7. Acknowledgements

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Integrating indigenous games into physical education: Students' experiences in Southwest Ethiopia

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ABSTRACT

Indigenous games constitute culturally situated forms of physical activity and community knowledge, yet their systematic integration into formal physical education remains limited. This study investigated secondary school students' perceptions and experiences of integrating indigenous games into physical education in Southwest Ethiopia and explored pedagogical, curricular, and institutional factors affecting implementation. A convergent parallel mixed-methods design was employed with 286 students from five secondary schools in Kaffa Zone. Quantitative data were collected through a structured questionnaire and analysed using descriptive statistics. Qualitative data were obtained from 10 students, four physical education teachers, and two school administrators through semi-structured interviews. Twenty physical education sessions were also observed. Interview and observation data were analysed thematically, and findings from the three strands were integrated during interpretation. Students expressed strong positive perceptions of indigenous games, particularly regarding curricular inclusion ($M = 4.48$, $SD = 0.71$), cultural understanding ($M = 4.41$, $SD = 0.74$), cooperation and teamwork ($M = 4.35$, $SD = 0.78$), and enjoyment ($M = 4.30$, $SD = 0.81$). However, 65.8% reported never participating or participating only once per term. Indigenous games appeared in only 15% of observed lesson plans, and none of the observed sessions demonstrated explicit alignment between games and stated curriculum objectives. Students also rated facilities and space ($M = 2.41$, $SD = 1.23$) and teacher encouragement ($M = 2.85$, $SD = 1.14$) comparatively low. Qualitative findings highlighted cultural meaning, informal participation, curriculum marginalisation, and gender-related participation patterns. The findings indicate a substantial gap between students' receptiveness to indigenous games and their formal curricular implementation. Effective integration requires curriculum recognition, teacher preparation, locally appropriate resources, community engagement, intentional lesson planning, and gender-responsive pedagogy. The study illustrates how culturally relevant pedagogy can connect community knowledge with formal physical education when institutional and pedagogical conditions support implementation.

KEYWORDS: Culturally relevant pedagogy; Sociocultural learning; Curriculum integration; Cultural heritage; Student participation; Gender equity; Secondary education

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1. Introduction

Physical education contributes to students' physical competence as well as their cognitive, affective, and social development. Quality physical education is associated with meaningful participation, inclusion, appropriately designed curricula, teacher development, community partnerships, and adequate resources (UNESCO, 2015). The cultural content through which physical activity is taught is therefore an important pedagogical consideration.

Indigenous games are embedded in local communities and may carry histories, social relationships, values, movement knowledge, and forms of collective participation. Research from African contexts associates indigenous games with physical, social, cognitive, and cultural learning, including cooperation, problem-solving, perceptual-motor development, and community connection (Brand, 2024; Hadebe-Ndlovu, 2022; Nxumalo et al., 2015; Sakala & Roux, 2024). Traditional games can also function as cultural resources through which learners encounter knowledge connected to family and community life (Bogopa, 2012; Thompson et al., 2014).

In Ethiopia, locally known games include Segno-Maksegno, Lebana Police, Abarosh, Suzi, Mehareben Yayachu, Gebeta, and Pepsi. Ethiopian educational materials recognise the contribution of indigenous games to physical capability and social interaction, while recent scholarship has documented the potential of indigenous play pedagogies for foundational motor competence (Aregay et al., 2022; Tadesse et al., 2026). The range of documented traditional sports and games also illustrates the breadth of Ethiopia's cultural physical-activity heritage (Eshetu et al., 2021).

Despite this potential, indigenous games may occupy a marginal position within formal physical education. The institutional prominence of football, volleyball, basketball, athletics, and other standardised sports can constrain curricular space for locally embedded activities. African research has identified curriculum time, teacher preparation, resource availability, and institutional priorities as barriers to integration (Matsekoleng, 2020; Mokotjo & Mokuku, 2020). Such conditions raise a pedagogical question: how can schools recognise students' existing cultural knowledge while transforming it into purposeful curriculum-aligned learning?

1.1. Theoretical Framework

Culturally relevant pedagogy (CRP) provides a useful framework for addressing this question. Ladson-Billings (1995) argued that students' cultural knowledge should function as an intellectual and pedagogical resource rather than as an occasional addition to schooling. Applied to physical education, this perspective suggests that indigenous games can connect physical competence with cultural knowledge, cooperation, identity, and meaningful participation. Culturally responsive physical education also requires teachers to recognise differences in students' experiences and learning needs when designing instruction and learning materials (Campos, 2026; Martin, 2026).

Sociocultural learning theory further explains why indigenous games may serve as educational resources. Learning is mediated through interaction, language, cultural tools, and participation in socially meaningful activities (Vygotsky, 1978). Indigenous games can therefore be understood not simply as physical activities but as culturally situated practices through which learners acquire rules, strategies, social norms, and meanings. Community members may contribute cultural and historical knowledge, while teachers provide pedagogical structure and curriculum alignment.

The two perspectives are complementary. CRP focuses attention on the legitimacy and educational use of students' cultural resources, while sociocultural theory highlights the social processes through which those resources become learning opportunities. Together, they suggest that the presence of an indigenous game in a lesson does not by itself constitute culturally responsive

pedagogy. Effective integration requires intentional objectives, inclusive participation, appropriate instruction, safety, assessment, and opportunities to connect the activity with cultural meaning (Fabian et al., 2024; UNESCO, 2015).

1.2. Research Gap and Purpose

Although existing literature documents the potential educational and cultural value of indigenous games, less is known about how students experience their integration into formal secondary physical education and how their perceptions correspond with actual classroom practice. In particular, there is limited evidence combining student perspectives with teacher and administrator accounts and direct observation of physical education lessons in the Ethiopian context. This study addresses this gap by examining student perceptions and experiences while considering teacher perspectives, school conditions, and observed pedagogical practice.

The study was guided by four research questions:

1. What are students' perceptions toward integrating indigenous games into physical education?
2. How do students experience indigenous games during physical education lessons?
3. What factors facilitate or hinder their integration?
4. What strategies may enhance effective integration?

2. Method

2.1. Research Design

A convergent parallel mixed-methods design was employed (Creswell & Plano Clark, 2018). Quantitative and qualitative data were collected during the same study period and analysed separately before being integrated during interpretation. The quantitative strand described the prevalence and distribution of students' perceptions and participation patterns, whereas interviews and observations provided contextual explanations and evidence concerning classroom practice.

2.2. Participants and Sampling

The target sample size was calculated using Yamane's formula (Yamane, 1967):

$$n = \frac{N}{1 + Ne^2}$$

where $N = 3,842$ total secondary school students in the five selected schools, and $e = 0.05$ (5% margin of error).

Using these values gives:

$$n = \frac{3,842}{1 + 3,842(0.05)^2} \approx 362$$

This yielded a target of 362 students.

Five secondary schools in Kaffa Zone were purposively selected based on the following criteria: (a) offering formal physical education programmes, (b) representing both urban and rural contexts, and (c) having at least 100 students enrolled in Grades 9–12. Within each school, students were stratified by grade level (9–12) and randomly selected proportionate to class size. A total of 286 students participated, representing a 79.0% participation rate of the target sample.

The quantitative sample comprised 286 students in Grades 9–12 from five purposively selected secondary schools in Kaffa Zone that offered formal physical education programmes. Stratified random sampling within schools yielded 156 male students (54.5%) and 130 female students (45.5%). The qualitative sample included 16 participants: 10 students, four physical education

teachers, and two school administrators. Twenty physical education sessions were observed across the five schools.

Demographic and school-context variables were collected to describe the sample and contextualise participants' experiences. They were not treated as primary explanatory variables in the present analysis.

2.3. Data Collection Instruments

2.3.1. Questionnaire

The structured questionnaire was developed through a multi-stage process. First, items were generated based on a review of relevant literature on indigenous games in physical education (Amusa & Toriola, 2010; Matsekoleng et al., 2024; Sakala & Roux, 2024) and adapted to the Ethiopian context. Second, three experts in educational research and physical education reviewed the items for content validity, clarity, and appropriateness. Third, the questionnaire was translated from English to Amharic and local languages (Kaffinonoo) by bilingual language experts, and back-translated to English to ensure accuracy (Brislin, 1970). The questionnaire comprised five sections: (a) demographic information (3 item), (b) perceptions of indigenous games (10 items), (c) participation frequency (1 item), (d) preferred activities (1 item with ranking), and (e) perceived barriers and enabling factors (10 items). Items were measured on a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree).

A pilot study was conducted with 30 students from a non-participating school. Specific Cronbach's alpha coefficients were: perceptions of indigenous games ($\alpha = .86$), cultural and social value ($\alpha = .84$), barriers and enabling factors ($\alpha = .82$), and teacher encouragement and resources ($\alpha = .79$). The overall Cronbach's alpha was .88, indicating good internal consistency.

2.3.2. Semi-Structured Interviews

Semi-structured interview guides explored experiences and perspectives among students, teachers, and administrators. Interviews were conducted in Amharic and local languages, transcribed, and translated.

2.3.3. Observation Checklist

An observation checklist documented lesson-plan inclusion, participation, gender equity, pedagogical use, cultural explanation, resources, safety, student engagement, and curriculum alignment. The observation criteria were coded dichotomously as "Yes" (criterion observed) or "No" (criterion not observed) during each 40-minute PE session. A criterion was coded "Yes" if it was present for at least 50% of the session duration or, for specific activities like indigenous games, if the activity occurred at any point during the session.

2.4. Procedure

Data were collected over six weeks. Questionnaires were administered during physical education sessions, followed by interviews and classroom observations. Permission was obtained from relevant institutional and zonal education authorities.

2.5. Validity, Reliability, and Trustworthiness

Three experts in educational research and physical education reviewed the instruments. A pilot study involving 30 students from a non-participating school produced specific Cronbach's alpha coefficients ranging from .79 to .86, indicating good internal consistency. Qualitative trustworthiness was addressed through attention to credibility, transferability, dependability, and confirmability

(Lincoln & Guba, 1985). Interpretations were grounded in interview accounts and compared with questionnaire and observation evidence.

2.6. Data Analysis

Quantitative data were analysed using IBM SPSS Statistics Version 26. All analyses were conducted using the raw data collected from the 286 participating students. Frequencies and percentages were used to describe categorical variables, while means and standard deviations summarised Likert-scale measures.

Qualitative interview and observation data were analysed thematically following Braun and Clarke's (2006) approach. Qualitative participants were purposively selected using maximum variation sampling to capture diverse perspectives. Ten students were selected based on grade level, gender (5 male, 5 female), and willingness to participate. Four physical education teachers were selected based on teaching experience (range: 3–22 years) and school representation. Two school administrators (one principal, one vice-principal) were selected to provide institutional perspectives.

Semi-structured interviews were conducted in Amharic or local languages (Kaffinonoo) based on participant preference. Each interview lasted 25–45 minutes (students: 25–35 minutes; teachers: 30–40 minutes; administrators: 35–45 minutes). All interviews were audio-recorded with participants' consent, transcribed verbatim, and translated into English by bilingual research assistants. Data analysis followed Braun and Clarke's (2006) six-phase thematic analysis approach.

Findings from the quantitative, qualitative, and observational strands were integrated using the "weaving" approach (Fetters et al., 2013), where findings from each strand were presented in a joint display (Table 7) and discussed thematically to identify convergence, complementarity, and divergence.

3. Findings

3.1. Participant Characteristics

Table 1 summarises the quantitative sample. The sample included students across four grade levels and represented both urban and rural school contexts. Male students constituted 54.5% and female students 45.5%.

Table 1 *Characteristics of quantitative participants (N = 286)*

Variable	Category	<i>n</i>	%
Gender	Male	156	54.5
	Female	130	45.5
Grade	9	82	28.7
	10	74	25.9
	11	68	23.8
	12	62	21.7
School context	Urban	162	56.6

Variable	Category	<i>n</i>	%
	Rural	124	43.4

3.2. Students' Perceptions of Indigenous Games

Students expressed consistently positive perceptions of the educational and cultural value of indigenous games (Table 2). The highest ratings concerned curricular inclusion ($M = 4.48$, $SD = 0.71$), cultural understanding ($M = 4.41$, $SD = 0.74$), cooperation and teamwork ($M = 4.35$, $SD = 0.78$), and enjoyment ($M = 4.30$, $SD = 0.81$). Teacher encouragement ($M = 2.85$, $SD = 1.14$) and facilities and space ($M = 2.41$, $SD = 1.23$) were rated considerably lower, providing initial evidence of a gap between student receptiveness and institutional support.

Table 2 Students' PEceptions of indigenous games in physical education

Item	<i>M</i>	<i>SD</i>
Enjoy participating in indigenous games	4.30	0.81
Make PE more interesting and motivating	4.19	0.87
Help students understand their culture	4.41	0.74
Improve cooperation and teamwork	4.35	0.78
Enhance physical fitness and endurance	4.13	0.90
Teachers encourage participation	2.85	1.14
Adequate facilities and space available	2.41	1.23
Should be part of the PE curriculum	4.48	0.71
Boys and girls participate equally	3.21	1.20
Develop problem-solving and creativity	4.27	0.84

Note. Items rated on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

3.3. Participation Frequency

Table 3 shows that 188 students (65.8%) reported either never participating or participating only once per term, whereas 40 students (14.0%) reported weekly or more frequent participation. Thus, students' positive perceptions were accompanied by limited opportunities for formal participation.

Table 3 Frequency of indigenous-game participation during PE lessons

Frequency	<i>n</i>	%
Never	84	29.4
Once per term	104	36.4
2–3 times per term	58	20.3

Frequency	<i>n</i>	%
Once per week	32	11.2
More than once per week	8	2.8
Total	286	100

3.4. Students' Ranking of Preferred Physical Activities

Students were asked to rank five physical activities according to their preference. The activities were ranked from 1 (most preferred) to 5 (least preferred). Based on the reported overall ranking, football was the most preferred activity, followed by athletics, indigenous games, volleyball, and basketball, respectively (Table 4). Notably, indigenous games occupied the third position among the five activities, indicating that they remained a meaningful component of students' activity preferences despite their limited formal incorporation into physical education lessons.

Table 4 Students' preferred physical education activities

Activity	Mean	Rank
Football	1.45	1
Athletics	2.38	2
Indigenous games	3.02	3
Volleyball	3.55	4
Basketball	3.90	5

Note. Lower mean rank indicates higher preference (1 = most preferred, 5 = least preferred).

3.5. Qualitative Experiences

Four major themes emerged from the interviews: (1) cultural meaning and enjoyment; (2) informal participation versus formal curricular marginalisation; (3) institutional and pedagogical constraints; and (4) gender-related participation patterns.

3.5.1. Cultural Meaning and Enjoyment

Students described indigenous games as familiar cultural activities connected to home, family, and community life. Their presence in school was valued because it could make learning culturally meaningful. One student explained:

"Games like Segno-Maksegno and Lebana Police are not just games; they are stories from our grandparents. Playing Segno-Maksegno feels like I am learning the wisdom of our ancestors. It's about strategy and patience, things our culture values."

Another student added:

"When we play games like Gebeta or Suzi, I feel connected to my grandparents. These are games they played when they were young. It makes me proud of my culture."

3.5.2. Informal Participation Versus Formal Marginalisation

Participants reported that indigenous games occurred more often during breaks or after school than during formal physical education. Teachers described curriculum and examination pressures as limiting opportunities to use locally known games. One teacher with 14 years of experience stated:

"The curriculum is fixed on modern sports. I know the students love Gebeta and Segno-Maksegno, but there is no space for them in my lesson plan. I have to prepare them for exams and competitions that don't include these games."

Another teacher with 22 years of experience observed:

"I remember playing these games as a child. They were part of growing up. But now, the school expects us to focus on football, volleyball, and athletics because those are what students are tested on. Indigenous games are seen as play, not serious learning."

3.5.3. Administrator Perspectives on Institutional Constraints

One school administrator (vice-principal with 10 years' experience) acknowledged the cultural value of indigenous games but identified institutional constraints:

"I grew up playing Segno-Maksegno and Gebeta. These games taught me patience and strategy. However, as a school, we are judged by our students' performance in regional sports competitions—football, athletics, volleyball. These are the activities that bring recognition to our school. Indigenous games are seen as recreational, not competitive. If the education bureau recognised them in official competitions, we would allocate more time and resources."

Another administrator emphasised resource and training limitations:

"The challenge is resources. We have limited sports equipment, and we prioritise the sports that students will be tested on. Indigenous games require minimal equipment—stones, sticks, open ground—but we still need guidance on how to teach them properly. Our teachers were not trained in these games"

3.5.4. Gender-Related Participation Patterns

Participants described participation patterns that were not consistently equitable. Physically demanding or competitive games could become male-dominated, whereas games such as Gebeta and Suzi were described as more inclusive when deliberately structured. A female student observed:

"When we play Lebana-Police, the boys are very aggressive and they don't always let us play. The teacher just watches. It feels like some games are 'for boys'."

A male student acknowledged:

"Sometimes we get too competitive and forget to include the girls. The teacher doesn't say anything. But when we play Gebeta, everyone can play because it's more about thinking than strength."

These accounts suggest that culturally familiar activities require intentional pedagogical organisation to ensure equitable participation.

3.6. Observed PE Practice

The observations corroborated limited institutionalisation (Table 5). Indigenous games appeared in only three of 20 lesson plans (15%), and none of the observed sessions demonstrated explicit alignment with curriculum objectives. Only two sessions used indigenous games to teach physical or

moral skills, while cultural explanation occurred in one session. Adequate space and materials were available in only one session. Equal participation of boys and girls was observed in four sessions (20%).

Table 5 *Observation of indigenous games in 20 PE sessions*

Criterion	Yes n (%)	No n (%)
Included in lesson plan	3 (15)	17 (85)
Students actively participated	5 (25)	15 (75)
Boys and girls participated equally	4 (20)	16 (80)
Demonstrated teamwork/cooperation	8 (40)	12 (60)
Used to teach physical or moral skills	2 (10)	18 (90)
Sufficient space/materials	1 (5)	19 (95)
Teacher explained cultural significance	1 (5)	19 (95)
Students expressed enjoyment/motivation	7 (35)	13 (65)
Safety precautions followed	12 (60)	8 (40)
Aligned with curriculum objectives	0 (0)	20 (100)

3.7. Barriers and Enabling Factors

Table 6 shows that students perceived inadequate facilities and equipment, curriculum emphasis on modern sports, limited teacher training, and restricted instructional time as important barriers. Cultural relevance and familiarity and student enthusiasm were the strongest enabling factors. The main challenge therefore appears to concern implementation conditions rather than student interest.

Table 6 *Perceived barriers and enabling factors*

Factor	M	SD
Barriers		
Inadequate facilities and equipment	4.34	0.81
Curriculum focused on Western sports	4.27	0.83
Limited teacher training	4.20	0.86
Lack of time in PE lessons	4.00	0.94
Teacher preference for modern sports	3.78	1.04
Enabling factors		
Cultural relevance and familiarity	4.40	0.73

Factor	<i>M</i>	<i>SD</i>
Student interest and enthusiasm	4.23	0.79
Community support	3.84	0.98
Availability of open spaces	2.91	1.20
Administrative support	2.70	1.23

3.8. Mixed-Methods Integration

Table 7 summarises convergence across data sources. The three evidence strands converged on a central pattern: students were receptive to indigenous games, but formal opportunities to learn through them were limited. Qualitative accounts explained this discrepancy in terms of curriculum pressures, teacher preparation, resource constraints, and participation practices, while observations demonstrated that these constraints were visible in actual lessons. The integration followed the "weaving" approach (Fetters et al., 2013), where findings from each strand were presented together and discussed thematically.

Table 7 *Integration of quantitative, qualitative, and observational findings*

Finding	Quantitative evidence	Qualitative evidence	Observation evidence	Integrated interpretation
Students value games	High cultural/curricular ratings	Cultural meaning and enjoyment	Enjoyment/motivation in some sessions	Strong student receptiveness
Formal participation is limited	65.8% never/once per term	Games mainly during breaks	15% included in lesson plans	Positive attitudes do not translate into systematic implementation
Teacher/institutional support is limited	Teacher encouragement <i>M</i> = 2.85	Insufficient training and curriculum space	10% used games pedagogically	Implementation capacity is constrained
Resources are inadequate	Facilities <i>M</i> = 2.41	Budget and spatial constraints	Adequate resources in 5% of sessions	Resource constraints are evident across strands
Participation equity requires attention	Equity item <i>M</i> = 3.21	Male dominance in some games	Equal participation in 20% of sessions	Gender-responsive pedagogy is needed

4. Discussion

The central finding is a substantial gap between students' positive perceptions of indigenous games and their limited formal implementation in physical education. Students strongly supported curricular inclusion and recognised cultural, social, and educational value, yet nearly two-thirds reported no more than one participation opportunity per term. Observations reinforced this discrepancy: indigenous games appeared in only 15% of lesson plans and were never explicitly aligned with curriculum objectives. The pattern is consistent with African research identifying

curriculum constraints, inadequate teacher preparation, resource shortages, and institutional priorities as recurrent barriers (Matsekoleng, 2020; Mokotjo & Mokuku, 2020).

4.1. Culturally Relevant Pedagogy and Physical Education

The findings support the relevance of culturally relevant pedagogy to physical education. Students perceived indigenous games as meaningful cultural practices, suggesting that these activities can bridge students' lived experiences and formal learning. However, culturally relevant pedagogy requires teachers to connect cultural resources with explicit learning purposes, inclusive participation, and appropriate pedagogical processes (Ladson-Billings, 1995).

The distinction between cultural familiarity and pedagogical integration is important. Teachers can use indigenous games to teach movement skills, cooperation, strategy, fitness, decision-making, and social responsibility while also creating opportunities to discuss cultural meanings and histories. Meaningful integration of traditional Indigenous games requires attention to curriculum, teacher preparation, and assessment (Fabian et al., 2024).

4.2. Sociocultural Learning and the Informal–Formal Connection

Students' accounts situated indigenous games within family and community relationships, while teachers described the games as familiar to students but marginal within formal lessons. This indicates that community-based knowledge could be brought into the classroom rather than displaced by standardised sporting activities. A sociocultural perspective highlights the role of interaction with peers, teachers, and community members in transforming familiar cultural practices into structured learning experiences (Vygotsky, 1978).

Recent Ethiopian work on indigenous play pedagogies supports the potential for aligning locally known games with foundational movement competencies (Tadesse et al., 2026). The objective is not to replace modern sports but to create a balanced physical education curriculum in which culturally meaningful activities coexist with established sports.

4.3. Curriculum, Teacher Preparation, and Resources

Curriculum and institutional conditions emerged as central constraints. Students rated curriculum emphasis on modern sports, limited teacher preparation, and lack of instructional time as important barriers, while teachers described examination and competition pressures. Teacher willingness alone is therefore unlikely to produce sustained integration when curriculum expectations provide little space for indigenous games.

Teacher education should include identifying locally appropriate games, documenting rules and variations, linking games to learning outcomes, adapting activities, ensuring safety, and assessing learning. Resource development should also be locally grounded. The Malawi Institute of Education's initiative to develop sourcebooks on traditional games illustrates one possible approach to supporting teachers with practical materials (Malawi Institute of Education, 2025).

Resource constraints require careful interpretation. Students rated facilities and equipment relatively low, and observations found adequate space and materials in only 5% of sessions. The challenge may involve access to appropriate space, organisation of available materials, and institutional prioritisation rather than equipment scarcity alone.

4.4. Participation Equity

The qualitative and observational findings indicate that cultural relevance does not automatically guarantee equitable participation. Students described situations in which boys dominated some competitive or physically demanding games, and equal participation was observed in only 20% of

sessions. Teachers should therefore monitor participation rather than assume that a culturally familiar activity is inherently inclusive. Mixed-gender grouping, role rotation, rule modification, and explicit participation expectations can help ensure equitable opportunities.

5. Limitations

The study was conducted in five secondary schools in Kaffa Zone, limiting transferability to other Ethiopian regions. Questionnaire findings relied on self-reports and may be affected by recall or social-desirability bias. The qualitative sample was relatively small and purposively selected. Finally, 20 observed sessions provide a useful but limited snapshot of classroom practice. Future research could use longitudinal and intervention designs, broader regional samples, and systematic evaluation of curriculum and teacher-development initiatives.

6. Implications and Recommendations

6.1. Implications

6.1.1. *Implications for Pedagogical Practice*

Curriculum developers should identify indigenous games that can be linked to explicit physical, cognitive, social, and cultural learning outcomes. Teacher educators should prepare teachers to teach locally relevant games safely and inclusively. School administrators should support access to spaces, locally available materials, and community knowledge. Physical education teachers should incorporate selected games into lesson plans rather than treating them as occasional recreational activities.

6.1.2. *Implications for Practice*

Curriculum developers should explicitly identify appropriate indigenous games and connect them to learning outcomes, instructional time, safety, and assessment. Teacher education institutions should provide practical preparation in indigenous games and culturally relevant, gender-responsive pedagogy. Schools should work with community members to document local games and identify appropriate spaces and materials. Teachers should use intentional grouping, role rotation, rule adaptation, and reflective discussion to support equitable participation and cultural learning.

6.1.3. *Implications for Research*

Future studies should examine indigenous-game integration across multiple Ethiopian regions and educational levels. Longitudinal and intervention designs could investigate whether curriculum and teacher-development initiatives increase implementation and improve student outcomes. Research should also document community knowledge before games are standardised for school use and examine how particular games can be aligned with movement, social, cognitive, and cultural learning outcomes.

6.2. Recommendations

6.2.1. *For curriculum developers and policymakers*

- Curriculum documents should explicitly incorporate selected indigenous games, intended learning outcomes, instructional time, safety requirements, assessment criteria, and scope for local adaptation.
- Develop teaching and learning resources, including teacher guides and student workbooks, in collaboration with community elders and PE specialists.

6.2.2. For teacher education institutions

- Pre-service and in-service teacher education must include practical preparation in indigenous games together with culturally relevant and gender-responsive pedagogy.
- Teacher training should address pedagogical approaches for specific games, gender-sensitive teaching strategies, and resource mobilisation.

6.2.3. For school administrators

- Schools should partner with community elders, identify open spaces and locally available materials, and monitor participation equity.
- Resource allocation should not automatically privilege modern competitive sports.

6.2.4. For PE teachers

- Embrace culturally relevant pedagogy by incorporating indigenous games into lesson plans and connecting them to broader learning objectives.
- Use strategies such as mixed-gender teams and game modifications to ensure equitable participation.

6.2.5. For researchers

- Future research should move to longitudinal and intervention designs, document community knowledge before standardisation, compare regions, and report effect sizes and confidence intervals. The goal is not to replace modern sports but to establish a balanced, culturally responsive PE curriculum in which both forms of activity coexist and support physical, cognitive, and social development.

7. Conclusion

This study demonstrates a clear discrepancy between students' positive perceptions of indigenous games and their limited formal integration into secondary physical education. Students recognised the cultural, educational, social, and motivational value of these activities, yet quantitative, qualitative, and observational evidence consistently indicated that indigenous games occupied a marginal position in formal instruction. The principal challenge therefore concerns the conditions of implementation rather than student receptiveness.

Sustainable integration requires explicit curriculum recognition, teacher preparation, appropriate resources, intentional pedagogical design, community engagement, and attention to equitable participation. Culturally responsive physical education should not be understood simply as the inclusion of culturally familiar activities; it requires the systematic transformation of cultural knowledge into meaningful, inclusive, safe, and curriculum-aligned learning experiences.

8. Declarations

8.1. Conflict of interest

The author declares that there are no competing interests.

8.2. Funding

This research received no external funding.

8.3. Author contributions (CRediT)

Aduḡna Eshetu Keto: Conceptualization; Methodology; Software; Formal analysis; Investigation; Data curation; Writing—original draft; Visualization

8.4. Data availability statement

The underlying dataset is not publicly available due to the involvement of secondary-school students and potentially identifiable information. Data may be available from the corresponding author on reasonable request, subject to ethical restrictions.

8.5. Ethics approval

The study was conducted in accordance with international ethical principles for research involving human participants (e.g., the Declaration of Helsinki). Permission was obtained from the participating schools, and participants were informed about the purpose of the study, the voluntary nature of participation, and their right to withdraw at any time. Informed consent was obtained from all participants prior to data collection, and confidentiality and anonymity were maintained throughout the research process.

8.6. Use of artificial intelligence (AI) tools

No generative AI tools were used in the preparation of this manuscript.

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Designer identity among graphic design students in the artificial intelligence era

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ABSTRACT

Generative artificial intelligence is changing design practice and raising questions about what it means to become a designer. This study examines how undergraduate graphic design students construct designer identities through professional positioning, creativity, control, and expectations for the future. A basic qualitative research design was employed with 18 students who had completed at least one comprehensive design project. Data were collected using a structured written form containing 16 open-ended questions, developed through a literature review and evaluation by a subject specialist and a qualitative research methods specialist. A five-stage hybrid thematic analysis combined deductive overarching categories with inductively generated codes and subcategories across five dimensions: designer identity, professional positioning, relationships with artificial intelligence, control, value and creativity, and perceptions of the future. Four subcategories were identified within each overarching category. Cross-category comparisons yielded four ideal-typical profiles: Technology-Integrated, Innovative, and Proactive; Traditional, Emotion/Art-Oriented, and Protective; Process/Development-Oriented and Cautious Student/Aspiring Designer; and Pragmatic, Functional, and Solution-Oriented. These profiles represent analytical configurations of meaning, not fixed participant groups; statements from the same participant could align with different profiles. Designer identity emerged as dynamic and context-sensitive, involving professional values, originality, perceived control, and technological change. Design education should recognize differing orientations toward artificial intelligence and support reflection on authorship, autonomy, and professional futures. Longitudinal and multi-institutional research could examine how these orientations develop across educational settings and stages.

KEYWORDS: Professional positioning; Creative agency; Authorship; Higher education; Hybrid thematic analysis

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1. Introduction

Graphic design has long been defined as a technical and applied field concerned primarily with the production of visual materials. The field's contemporary character, however, points to a complexity that extends beyond this narrow definition. Design practice is now understood as an integrated activity that encompasses not only the production of aesthetic solutions but also problem solving, decision making, and interaction with different stakeholders. Underlying this change is a process of digital transformation that has reshaped design tools, workflows, and modes of production.

Automation, generative algorithms, and interactive design tools have rapidly transformed graphic design.

The historical development of design reveals the close relationship between technological progress and changes in professional practice. Hamalainen (2024) shows that design has not developed independently of technological advances and that technological changes have played an important role in transforming design practice. A similar transformation is evident in professional roles and terminology: writing specifically about learning design, Wagner (2025) notes that even the name of the discipline continues to evolve. Graphic design should therefore be understood as a dynamic profession that continually responds to social and technological changes rather than as a fixed set of practices.

Although technology is central to the factors that make graphic design so changeable, the primary effects of this transformation are experienced by the person using it: the designer. At this point, the discussion shifts from design practice to the concept of designer identity. Professional identity is not unique to design; it has also been examined systematically in professional contexts such as teaching, law, and higher education (Cardoso et al., 2014; Clarke et al., 2013; Thomson, 2015). In their review of this literature, Beijaard et al. (2004) describe professional identity as a dynamic construct that is continually reconstructed through interaction with context rather than as a fixed characteristic. Designer identity undergoes a similar process of construction, closely intertwined with design education. Studies of instructional design education indicate that professional identity construction can be supported through reflective thinking and reflective writing (Hutchinson & Tracey, 2015; Tracey et al., 2014). As Dall'Alba explains, learning to become a professional concerns not only what we know and can do but also who we are becoming (2009, as cited in Baha et al., 2020). This perspective redefines the purpose of design education: programs should develop students' technical skills while also supporting their process of becoming designers.

The question of when a student becomes a designer consequently involves the development of a professional identity as well as the acquisition of technical competence. In legal education, Thomson (2015) argues that professional identity cannot be taught directly through didactic instruction, but that its development can be intentionally supported through learning experiences that encourage students to question professional values, responsibilities, and their own professional selves. The central purpose of design education is therefore to develop designer identity alongside professional skills.

Designer identity cannot be explained through a single component. Kunrath et al. (2016) define it as a combination of personal attributes and design skills developed through education and experience, arguing that a holistic understanding requires consideration of both dimensions. Within this framework, creativity occupies a central place in designers' self-definition rather than functioning merely as an indicator of ability. Kunrath et al. (2020) similarly conceptualize designers' professional identity as a social and self-perceptual construct describing how designers understand themselves as professionals. They emphasize that this identity begins to take shape in higher education and develops and is reconfigured through social interactions during the transition to professional life. Professional values are another important component: the grounds on which students make design decisions and the outcomes they consider important can be read as concrete expressions of their identity. Examining development during education, Kunrath et al. (2017) found different profiles of professional self-awareness among undergraduate and postgraduate students, with identity components developing at different rates. Personal attributes changed particularly slowly, whereas

design skills developed more noticeably through education. These findings locate designer identity at the intersection of personal characteristics, acquired capabilities, and professional values.

The transformation of graphic design practice and the multidimensional nature of designer identity are especially visible in the context of generative artificial intelligence (AI). Through text-to-image systems, generative AI tools directly affect ideation and change the interaction between designers and clients. In a study of architectural practice, Schneider et al. (2025) report that AI facilitates clients' direct participation in design, progressively shifting designers' roles from generating ideas to evaluating the feasibility of generated ideas. They emphasize that this transformation creates uncertainty concerning creative agency, professional authority, and authorship. In human–AI collaboration, Azhar (2026) proposes the concept of algorithmic intimacy to describe the emotional and collaborative bonds that student designers develop with AI tools and shows how these relationships shape attribution of authorship and professional identity formation. Identity in AI-assisted design is therefore not simply a matter of tool use; it also involves the extent to which personal identity is reflected in an output and the question of who can claim authorship (Azhar, 2026). Drawing on existing research, Zhou et al. (2025) link the gradual assumption of traditional, manual design responsibilities by AI algorithms to designer dematerialisation. They suggest that this transformation changes the competencies expected of designers, foregrounding interaction with AI and strategic decision making. AI thus provides a powerful context in which the meaning of being a designer is being reconsidered.

The literature seeks to explain this transformation along two distinct lines. One body of research examines how professional identity is constructed across the transition from education to professional life, focusing on educational environments, professional development, social context, and professional interactions (Beijaard et al., 2004; Kunrath et al., 2020). Another centers on contemporary technological transformation, particularly the effects of generative AI on design processes, addressing its ethical and professional consequences alongside automation and increased efficiency (Elgendy, 2024; Özdal, 2024; Zhou et al., 2025). Nevertheless, research on the formation and transformation of professional identity in design remains relatively limited. Tracey and Hutchinson (2018, p. 263) observe that academic discourse in design has paid little attention to professional identity development and that the subject remains insufficiently addressed in design education. Similarly, Bjorklund et al. (2020) emphasize the limited understanding of how designers construct their professional identities as their organizational roles change. They highlight the need to understand how designers position themselves and negotiate professional identities within changing professional contexts. Baha et al. (2020), meanwhile, argue that existing literature predominantly focuses on professional identity based on institutionalized definitions of design, giving relatively less attention to students' personal motivations for wanting to become designers. Taken together, these observations suggest that identity debates arising around AI have not yet been adequately addressed through a framework that makes differences in students' individual perceptions and positioning visible. Research explaining how students make sense of their designer identities within the changing design ecosystem remains limited.

This gap is not only theoretical but also a practical issue with direct implications for the future of design education. Graphic design students must shape their identities in an environment that already includes AI before they enter professional practice. Understanding how they position themselves is therefore necessary for adapting design curricula and career guidance to this new reality. If students' perceptions of designer identity follow different orientations rather than a single pattern, systematically identifying these differences becomes particularly important. This study addresses

that need by considering students' accounts of designer identity, professional positioning, relationships with AI, perceptions of control, value and creativity, and expectations concerning their professional futures as an interconnected whole. It draws on written responses grounded in students' own experiences and examines how they construct their designer identities within a changing design context. A basic qualitative design and hybrid thematic analysis are used to identify the patterns through which these meanings are connected.

The study addresses five research questions concerning these interconnected dimensions. The questions examine how students define themselves and their profession, how they interpret their relationships with AI, and how their values and future expectations differ. They guide the organization of the analysis and the presentation of the findings:

1. How do graphic design students define designer identity?
2. How do graphic design students position themselves professionally?
3. How do graphic design students make sense of their relationships with AI?
4. How do graphic design students' understandings of control, value, creativity, and originality differ?
5. How do graphic design students' perceptions of their professional futures and educational needs differ?

2. Method

2.1. Research Design

This study employed a basic qualitative research design to explore the meanings that graphic design students attribute to designer identity and professional positioning in the context of generative AI. Basic qualitative research focuses on understanding how participants interpret their experiences and the meanings they assign to them (Merriam, 2009). Accordingly, students' written statements about designer identity, professional positioning, relationships with AI, control, value and creativity, and perceptions of the future were considered together. The typologies were developed to make recurring patterns of meaning visible as ideal-typical profiles across five analytical dimensions. Their purpose was to identify complementary patterns across statements from different participants, not to classify participants into groups. A basic qualitative design was preferred because the aim was to describe and interpret the meanings students themselves attach to designer identity, rather than to explain the essence of a lived experience (phenomenology), to generate a theory (grounded theory), or to examine a single bounded case. This orientation shaped how the typologies were built. Open coding and subcategories remained close to participants' statements, and the ideal-typical profiles were developed only afterwards, as an analytical synthesis of those subcategories. The profiles are therefore interpretive constructs derived from the findings of the basic qualitative analysis.

2.2. Participants

The participants were 18 undergraduate graphic design students studying in a medium-sized faculty of fine arts in Türkiye who had completed at least one comprehensive design project. They were selected through criterion sampling, a purposive sampling strategy. The central inclusion criterion was that students had experienced all stages of the design process and were able to reflect on designer identity and their professional futures. Selecting a qualitative sample in line with the research purpose supports access to information-rich cases concerning the phenomenon under investigation (Merriam, 2009). Participants' experience with different project types, including children's book design, corporate identity design, social awareness campaigns, packaging design,

and typography, enabled meanings of designer identity to be examined across varied production experiences. Participant identities were kept confidential, and each participant was assigned a source code from K1 to K18.

2.3. Data Collection Instruments

Data were collected using the Graphic Design Students' Professional Identity Perceptions Form, developed by the researchers through a staged process. First, the literature on professional identity, designer identity, design education, and AI-assisted design was reviewed. A structured written form with open-ended questions was selected in line with the research questions, and question structures in similar instruments were examined. A pool of questions was then prepared to cover perceptions of designer identity, professional positioning, relationships with AI, control, value and creativity, and perceptions of the future. One subject specialist and one qualitative research methods specialist evaluated the draft form for alignment with the research purpose and questions, coverage, clarity, comprehensibility, sequence, and answerability. Repetitive and ambiguous wording was revised in response to their feedback. The finalized form contained 16 open-ended questions that were aligned with the study's objectives, understandable, and conducive to detailed responses. It comprised five sections corresponding directly to the five overarching analytical categories: designer identity perceptions (Questions 1–5), professional positioning (Questions 6–8), relationships with AI (Questions 9–12), control, value and creativity (Questions 13–14), and perceptions of the future (Questions 15–16).

2.3.1. Procedure

Data were collected during May 2026 from 18 undergraduate graphic design students studying in a medium-sized faculty of fine arts in Türkiye who met the inclusion criterion. Participants voluntarily completed a structured open-ended form, responding on the basis of design projects they had previously completed and experiences gained during their graphic design education. Students completed the forms individually and returned them to the researchers. The handwritten forms were analyzed directly, and each form was linked to a source code between K1 and K18.

2.4. Data Analysis

Data analysis in this study sought to identify recurring patterns of meaning systematically and to connect interpretations directly to the data. This approach is consistent with the requirements of basic qualitative inquiry described by Merriam (2009). The data were analyzed through a five-stage hybrid thematic approach combining deductive and inductive processes (Braun & Clarke, 2006; Fereday & Muir-Cochrane, 2006). The analysis was carried out by one of the researchers across all five stages, and the resulting codes, subcategories, comparison matrix, and profiles were then examined together with the second researcher. The staged procedure described below, together with this joint examination, supported the reliability of the analysis (see also Section 2.4.1). In the first stage, five overarching categories were established in parallel with the instrument's structure: Designer Identity, Professional Positioning, Relationships With AI, Control, Value and Creativity, and Perceptions of the Future. All responses were organized within this deductive framework.

In the second stage, inductive analysis was conducted through open coding. All responses to the open-ended questions were read line by line, and the key ideas in each statement were translated into conceptual codes. For example, metaphors such as a “piggy bank,” used by participants to describe themselves, and statements describing AI as “just a tool” or “a partner that supports the process” were coded separately. Line-by-line analysis enables detailed identification of concepts,

categories, and subcategories within the data (Güler et al., 2013). No predetermined subcategory or typology template was used during coding.

In the third stage, codes that were similar and shared the same thematic meaning were grouped into subcategories. For example, statements about who made the final decision during design generated the Operator Control subcategory. Statements from participants who did not develop a sense of ownership over AI-generated outputs formed the Threat to Ownership subcategory. Thus, the overarching categories derived from the structure of the data collection instrument, whereas the subcategories emerged directly from participants' statements.

In the fourth stage, a comparison matrix was used to examine conceptual similarities, contrasts, and complementary relationships among the subcategories within the five overarching categories. The units of analysis were statements, rather than participants, and their sources remained traceable through participant codes. For example, statements defining design as artistic expression and the communication of emotion were compared with statements presenting AI as a threat to ownership and human labor. These statements were examined as manifestations of the same meaning orientation across different analytical dimensions. The analysis therefore sought coherent configurations of meaning across the five dimensions rather than assigning individual participants to particular classes.

In the fifth and final stage, similar and divergent meaning patterns across the subcategories were compared, and four designer identity profiles were developed by analytically combining complementary orientations across the five overarching categories. These profiles are not classes that place participants into fixed, mutually exclusive groups. A participant's statements may align with more than one profile in different contexts. The typologies simplify complex and fluid discourses within the dataset to make visible the principal positions that designer identity assumes in relation to technology, professional values, control, and perceptions of the future. Categories and profiles were supported by direct participant statements so that their relationship to the data could be traced. Table 1 summarizes the overarching analytical categories and examples of the subcategories developed within them.

Table 1 *Overarching analytical categories and examples of subcategories*

Category	Examples of subcategories	Analytical focus
Designer identity (DI)	Problem solving; emotion/art; developing student; functional translation	How participants define being a designer
Professional positioning (PP)	Interdisciplinary; independent art; market adaptation; agency/commercial	Desired field of work and understanding of success
Relationships with AI (RAI)	Partner/assistant; threat; conditional consultant; technical tool	Role assigned to AI in the design process
Control, value and creativity (CVC)	Human direction; labor/emotion; original thought; operator control	Authority over production and the source of design value
Perceptions of the future (PF)	Continuous development; professional threat; uncertainty/learning; functional adaptation	Orientation toward the profession's future and educational needs

Note. AI = artificial intelligence; DI = designer identity; PP = professional positioning; RAI = relationships with AI; CVC = control, value and creativity; PF = perceptions of the future.

2.4.1. Validity and Reliability

The study addressed validity and reliability through the criteria commonly used to evaluate qualitative inquiry. These include credibility, transferability, dependability, and confirmability (Lincoln & Guba, 1985). To support these criteria, the research design, participant selection criteria, instrument structure, and analytical stages were described. Reporting the sample, data collection instrument, and analytical procedures enables readers to trace how findings were generated and assess their credibility (Creswell & Miller, 2000). These descriptions provide the basis for evaluating the relationship between the research process and its interpretations.

To support credibility, the categories and typologies were grounded in participants' written responses and illustrated with direct quotations. A staged analytical process was established through which the relationships among open codes, subcategories, and overarching categories could be followed. Illustrating the categories with direct participant statements in the Findings section enables readers to assess the relationship between analytical interpretation and the raw data. Defining ideal-typical profiles as analytical constructs that explain similarities and contrasts among statements, rather than as participant classes, also makes the scope of interpretation explicit.

Transferability was supported by an account of the institutional context, inclusion criterion, and sampling strategy. Criterion sampling and the inclusion of students with experience of different design projects allow the findings to be considered in relation to similar educational contexts. Presenting findings alongside direct quotations also provides detailed description through which readers can judge transferability to other settings (Merriam, 2009). Dependability was supported by conducting the analysis in five successive stages: establishing overarching categories, open coding, developing subcategories, constructing a cross-category comparison matrix, and developing ideal-typical profiles. To support confirmability, interpretations were restricted to recurring patterns of statements in the dataset, participant codes were used only to trace the sources of statements, and each category was linked to direct quotations. The instrument-development and expert-review procedures described in Section 2.3 supported the clarity and conceptual coverage of the questions (Creswell & Miller, 2000; Patton, 2014).

2.5. Ethical Considerations

Participant identities were kept confidential. Source codes K1–K18 were used to link statements to their sources. Ethical considerations were taken into account at every stage of the research process.

3. Findings

This section presents the findings systematically in relation to the five research questions. For each question, the categories are first defined in terms of their conceptual scope, then grounded in direct participant statements, and finally interpreted in relation to the research problem. Quotations were selected from statements that most clearly reflected the boundaries of each category; equal representation of participants was not an objective. This presentation makes the relationship between raw data and analytical interpretation traceable and enables comparison of differing patterns of meaning concerning designer identity. Participant quotations have been translated from Turkish into English, and the original K1–K18 source codes have been retained.

To make conceptual relationships across the five research questions visible, Table 2 summarizes the four ideal-typical designer identity profiles across the five analytical dimensions. The categories and direct participant statements underlying these patterns are elaborated in the following subsections.

Table 2 Four designer identity profiles across five analytical dimensions

Domain	Profile 1	Profile 2	Profile 3	Profile 4
DI	Innovative problem solver	Emotional artist	Developing student/aspiring designer	Functional visual translator
PP	Interdisciplinary and international	Artistic and independent	Development and market adaptation	Commercial and agency
RAI	Production partner and assistant	Threat to ownership	Conditional consultant	Technical tool
CVC	Human-directed creativity	Value centered on human labor and emotion	Original thought remaining human	Operator control
PF	Adaptation and continuous development	Professional threat and protection	Uncertainty and learning needs	Functional adaptation

Note. AI = artificial intelligence; DI = designer identity; PP = professional positioning; RAI = relationships with AI; CVC = control, value and creativity; PF = perceptions of the future. Profile 1 = Technology-Integrated, Innovative, and Proactive; Profile 2 = Traditional, Emotion/Art-Oriented, and Protective; Profile 3 = Process/Development-Oriented and Cautious Student/Aspiring Designer; Profile 4 = Pragmatic, Functional, and Solution-Oriented. Profiles represent analytical configurations of statements, not participant groups.

3.1. Designer Identity

The first research question examined how graphic design students define designer identity. It explored the fundamental meanings through which students answer the question “Who is a designer?” The analysis identified four subcategories of designer identity perception: Innovative Problem Solver, Emotional Artist, Developing Student/Aspiring Designer, and Functional Visual Translator.

Innovative Problem Solver. This subcategory comprises statements defining the designer as a proactive agent who transforms conventional visual language, establishes new conceptual relationships, and solves problems. It is illustrated by “Disrupting the ordinary and building a new conceptual language, solving problems” (K5) and “I am a creative designer who focuses on solutions to problems” (K17). These statements indicate that some students construct designer identity through the ability to generate innovation and creatively synthesize different elements.

Emotional Artist. This subcategory encompasses statements that view the designer as an artist who transforms feelings and thoughts into visual narratives, empathizes with others, and creates personal stories. Examples include “I am a designer who expresses my feelings and thoughts through visual expression” (K3) and “I am a vector artist, and video editing is my area of expertise; I think someone with these abilities is a graphic designer” (K8). The K3 statement foregrounds emotional expression, whereas the K8 statement emphasizes artistic identification and technical expertise. Together, these accounts suggest that, for some students, designer identity is primarily a form of personal expression and artistic belonging.

Developing Student/Aspiring Designer. This subcategory comprises statements defining designer identity as an unfinished process of learning and accumulating experience. It is illustrated by “I see myself as a piggy bank that has only just become half full” (K16), “Someone who keeps trying, because the more you try, the better the work that emerges” (K9), and “Somewhere between a

student and a designer; I can produce good work, but there is still a lot I need to learn” (K9). These findings indicate that students position themselves within the process of identity formation rather than outside designer identity.

Functional Visual Translator. This subcategory encompasses statements defining the designer as a professional who solves a problem and transforms verbal or complex requests into clear visual messages. Examples include “It is about solving a problem and clearly expressing what is wanted to the other party” (K2), “A visual translator, perhaps: I translate people’s verbal requests into visual expression” (K2), and “A bridge that turns words into images” (K3). Designer identity can thus also be constructed through function, communication, and meeting client needs.

3.2. Professional Positioning

The second research question examined how students position themselves professionally. It explored their desired future working environments, areas of expertise, and understandings of success. The findings were organized into four subcategories: Interdisciplinary and International Positioning, Artistic and Independent Positioning, Development and Market Adaptation, and Commercial and Agency Positioning.

Interdisciplinary and International Positioning. This subcategory encompasses ambitions to work at the intersection of new technologies and different design fields and to gain visibility in national or international projects. It is illustrated by “I would like to be a designer with a distinctive design language who takes part in national or international projects” (K10) and “At the intersection of CGI [computer-generated imagery], digital motion graphics, and conceptual typographic work” (K5). These statements show professional identity being constructed through innovation, a diversity of expertise, and visibility on a broad scale.

Artistic and Independent Positioning. This subcategory includes aspirations such as holding original exhibitions and incorporating personal feelings and stories into design. Examples include “Writing poetry, reflecting emotional expression in my designs, and creating original stories” (K3) and “I want to be a designer who has developed my own style, can touch people through my work, and keeps creating” (K11). For some students, professional success therefore means establishing a space for original expression rather than attaining commercial status.

Development and Market Adaptation. This subcategory concerns efforts to address gaps in knowledge and prepare for the market before attaining a clearly defined professional status. It is illustrated by “A student who is still developing and lacks sufficient knowledge; I feel that I belong neither to the industry nor to the market, and I see myself as someone who acknowledges shortcomings and tries to close the gaps” (K16). Professional positioning is thus experienced as a matter of acquiring competence during the transition from student to professional.

Commercial and Agency Positioning. This subcategory includes ambitions to work within an agency, establish one’s own agency, or pursue graphic design directly as a profession. Examples include “An agency owner. I am setting up an agency” (K4), “A designer whom clients will come back to after they have agreed to work with a poor designer” (K4), and “I see myself in the business sector, having made graphic design my profession” (K2). These statements reveal an aspect of designer identity constructed through entrepreneurship and the provision of professional services.

3.3. Relationships With AI

The third research question examined how students make sense of their relationships with AI. It explored the positions assigned to AI in the design process as partner, threat, consultant, or tool. The

findings were organized into four subcategories: Production Partner and Assistant, Threat to Ownership, Conditional Consultant, and Technical Tool.

Production Partner and Assistant. This subcategory comprises statements defining AI as a helper that supports ideation, accelerates draft production, and participates in the process. Examples include “Developing ideas, producing quick visual drafts, speeding up the steps, like an active assistant” (K5) and “It is a partner that provides support and helps improve the design process” (K11). These statements place AI in a supportive role that strengthens the creative process rather than replacing the designer.

Threat to Ownership. This subcategory encompasses statements indicating that AI use weakens designers' sense of ownership of and connection to their work. It is illustrated by “I prefer not to use it because I cannot say I made this” (K8), “I do not feel it, because I cannot say I made it” (K8), and “Well, not really, because I do not think of it as contributing an original idea” (K15). Resistance to AI thus arises not only from technical concerns but also from a sense of lost authorship and identity.

Conditional Consultant. This subcategory concerns limited use of AI, particularly when ideation stalls or reaches an impasse. Examples include “Sometimes it helps, and sometimes it does not help at all” (K16) and “Getting help when I am completely stuck and at a dead end” (K15). The tool is therefore used as a source of advice when needed rather than as a continuous partner.

Technical Tool. This subcategory comprises statements that do not attribute emotional qualities or creative agency to AI and instead view it as a technical resource that accelerates work. It is illustrated by “A tool. Artificial intelligence is artificial, as the name says; when you start from an idea, all the designs look alike” (K4) and “It is entirely a tool; the graphic takes shape in my hands, and without us it is inadequate on its own” (K2). AI is thus assigned an instrumental position in which it does not produce value independently of the designer.

3.4. Control, Value and Creativity

The fourth research question examined differences in students' understandings of control, value, creativity, and originality. Within this dimension, originality was examined in relation to control, value, and creativity. The question explored how authority over production and the source of design value are distributed between humans and AI. Four subcategories were identified: Human-Directed Creativity, Value Centered on Human Labor and Emotion, Original Thought Remaining Human, and Operator Control.

Human-Directed Creativity. This subcategory comprises statements asserting that the designer determines artistic direction and makes the final decision even when AI participates in production. Examples include “It is my mind that gives AI the prompt and artistic direction” (K5) and “Although AI generally serves as a tool in the design process, the designer is the one who chooses the right ideas and evaluates the resulting output” (K12). Creative authority is therefore retained by the human designer even when collaborative production is accepted.

Value Centered on Human Labor and Emotion. This subcategory encompasses statements linking the value of design to human labor, personal style, and the empathetic communication of emotion. It is illustrated by “The designer's style and human labor” (K6) and “Entirely the communication of emotion, I think; whoever communicates emotion better” (K18). Originality is thus defined through human experience and emotional expression rather than merely through technical difference.

Original Thought Remaining Human. This subcategory includes statements that acknowledge AI's extensive productive capacity while locating the source of original ideas in the designer. Examples include “AI can produce anything, but original thought comes from the designer” (K9) and “It will

depend on the ability to generate original ideas, solve problems, and express one's own perspective, because however much technology develops, original thought still comes from humans" (K11). The boundary between humans and technology is therefore drawn through the originality of thought rather than the quantity of production.

Operator Control. This subcategory comprises statements attributing all control to the human who writes prompts and manages the software. It is illustrated by "I enter the prompt. I make the edits" (K4), "Under [the designer's] control. AI is just a tool" (K7), and "Entirely mine. I manage the AI too" (K2). Process management and technical decisions are thus treated as the primary basis of designer authority, independently of creativity.

3.5. Perceptions of the Future

The fifth research question examined students' perceptions of their professional futures and educational needs. Within this dimension, educational needs were considered alongside expectations for professional life. The question explored how students position themselves in relation to adaptation, concern, uncertainty, and functionality in the face of technological transformation. The findings were organized into four subcategories: Adaptation and Continuous Development, Professional Threat and Protection, Uncertainty and Learning Needs, and Functional Adaptation.

Adaptation and Continuous Development. This subcategory encompasses statements suggesting that the future belongs to designers who adapt to technology and develop creative thinking. Examples include "Someone who uses technology well and can think creatively. I see myself as a designer who continually develops in this area" (K10) and "Someone who uses AI appropriately and is a good researcher in design; that is how I see myself" (K6). Educational needs are therefore perceived in terms of learning new tools while also developing creative competence.

Professional Threat and Protection. This subcategory comprises statements viewing the spread of AI as a threat to professional security and the value of human labor. It is illustrated by "Negative and worrying; my profession is not safe" (K8) and "I do not want it to become too widespread; human labor loses its meaning" (K6). Future educational expectations therefore need to encompass protection of human labor and originality as well as technical adaptation.

Uncertainty and Learning Needs. This subcategory includes statements that do not articulate a clear direction for the future in the face of technological transformation. Examples include "I cannot see a future yet" (K16) and "I cannot see myself anywhere for now, and I think the designer of the future will be AI; even now, people have AI do the work instead of designers and then print it" (K16). These statements indicate a need for greater educational support in technological literacy, professional orientation, and originality so that students can assess their professional futures.

Functional Adaptation. This subcategory comprises statements viewing technological development as inevitable and assessing AI positively insofar as it helps solve practical problems. It is illustrated by "Avoiding technological developments only harms us" (K7) and "It will continue to produce solutions to problems" (K2). Preparing for the future is therefore associated with effective, purposeful tool use rather than investing technology with emotional meaning.

The patterns summarized in Table 2 were derived from relationships among subcategories across the five analytical dimensions. The following profiles synthesize these recurring configurations of meaning. These profiles are analytical constructs rather than statistically representative participant classes. Participant codes are cited alongside the quotations so that the evidential basis of each profile can be traced, and the number and detail of supporting statements differ across profiles and dimensions (see Section 4.1). The same participant's statements can also be illustrated under

subcategories of different profiles; for example, statements by K11 appear under Production Partner and Assistant (Profile 1), Artistic and Independent Positioning (Profile 2), and Original Thought Remaining Human (Profile 3).

3.6. Designer Identity Profiles

Technology-Integrated, Innovative, and Proactive. This ideal-typical profile analytically combines statements that construct designer identity as continually evolving. Within this pattern, the designer is an agent who transforms conventional visual language and creates new conceptual relationships, as expressed in “Disrupting the ordinary and building a new conceptual language, solving problems” (K5). Professional ambitions concern visibility in interdisciplinary and international projects. AI is positioned as a partner that accelerates the process rather than as a threat: “It is a partner that provides support and helps improve the design process” (K11). Nevertheless, final decisions and artistic direction remain the designer's responsibility. Statements about the future similarly emphasize technology use alongside continuous development.

Traditional, Emotion/Art-Oriented, and Protective. This ideal-typical profile combines statements that define designer identity through art and emotional expression with protective orientations toward AI. Within this pattern, the designer is described as a “vector artist” (K8), while professional ambitions involve establishing a space for original expression rather than commercial success: “Writing poetry, reflecting emotional expression in my designs, and creating original stories” (K3). AI is described as undermining the sense of ownership and connection to one's work, as in “I do not feel it, because I cannot say I made it” (K8). The value of design is associated with human labor, emotion, and personal style. Statements about the future foreground concern for protecting the profession and the value of human labor.

Process/Development-Oriented and Cautious Student/Aspiring Designer. This ideal-typical profile combines statements that construct designer identity as an ongoing learning process rather than an accomplished position. Describing oneself as “a piggy bank that has only just become half full” (K16) links professional positioning to addressing knowledge gaps and preparing for the market. Statements describing recourse to AI only when blocked, such as “Getting help when I am completely stuck and at a dead end” (K15), accompany a cautious acceptance that original thought should remain human. Uncertainty about the future, expressed in “I cannot see a future yet” (K16), suggests a fluid position within education rather than a fixed identity.

Pragmatic, Functional, and Solution-Oriented. This ideal-typical profile analytically combines statements that construct designer identity through service and problem solving rather than primarily as an emotional or artistic identity. The designer is a “visual translator” who turns complex requests into understandable visual messages: “I translate people's verbal requests into visual expression” (K2). Professional ambitions involve establishing an agency or working within commercial organizations. AI is positioned solely as a technical tool that accelerates work, as expressed in “It is entirely a tool; the graphic takes shape in my hands, and without us it is inadequate on its own” (K2), while control is attributed to the human entering the prompt. Statements concerning the future indicate a functional orientation that accepts technological development as inevitable and values tools insofar as they solve practical problems.

4. Discussion

This study examined how graphic design students construct designer identities in the context of generative AI. Using a basic qualitative design and written accounts from 18 students, it addressed the limited understanding of how professional identity and technological change intersect in design

education. The findings indicate that students' statements cannot be explained through a single pattern but can be interpreted through four ideal-typical configurations of meaning. Abbreviated as Technology-Integrated, Traditional/Protective, Student/Aspiring Designer, and Pragmatic, these typologies connect the educational construction of professional identity with the effects of generative AI on design practice at the level of statements rather than dividing participants into groups. Tracey and Hutchinson (2018) identify limited academic attention to professional identity development in design, while Zhou et al. (2025) emphasize the limited synthesis of AI's effects on designer identity. The patterns identified here suggest that these two dimensions are intertwined in students' accounts rather than occurring independently.

The Technology-Integrated, Innovative, and Proactive typology explains how statements positioning AI as a production partner rather than a threat combine with an emphasis on innovation, continuous learning, and creative control. This pattern resembles the innovator and co-creator identity narratives identified by Bjorklund et al. (2020), whose findings highlight innovation, learning, and a sense of community as recurring features. The observation by Schneider et al. (2025) that AI can shift designers' roles from generating ideas to evaluating them also parallels statements positioning AI as an assistant. Azhar's (2026) concept of algorithmic intimacy, developed to explain collaborative bonds between student designers and AI tools, helps interpret the co-production orientation in this ideal-typical profile. Together, these connections situate the profile within a professional orientation that combines technological participation with retained creative direction.

The Traditional, Emotion/Art-Oriented, and Protective typology explains the conjunction of statements defining design as an extension of human labor and emotional expression with statements viewing AI as a threat to originality and ownership. This orientation resembles concerns about competencies and professional roles associated with designer dematerialisation in the literature (Zhou et al., 2025). Elgendy (2024) likewise notes that integrating AI into graphic design raises concerns about job security, originality, and transparency. Schneider et al.'s (2025) finding of uncertainty in architects' perceptions of authority and originality is also comparable to the loss of connection to one's work expressed here. The crafter narrative identified by Bjorklund et al. (2020) provides a conceptual basis for interpreting the protection of labor and personal production. This profile thus connects concerns about technological change to the sources from which students derive the value and personal significance of design.

The Process/Development-Oriented and Cautious Student/Aspiring Designer typology explains statements that construct designer identity through experimentation, learning, and addressing shortcomings rather than through a completed professional position. This pattern resembles Kunrath et al.'s (2017) finding that elements of designer identity consolidate slowly throughout education. Studies of reflective writing by Tracey et al. (2014) and Hutchinson and Tracey (2015) also show that students can struggle to move from describing their experiences to attributing professional meaning to them. Expressions of uncertainty about the future and conditional reliance on AI can therefore be interpreted as a fluid identity orientation within education rather than as characteristics of a fixed student group. Dall'Alba's account of becoming a professional as involving who we are becoming alongside knowledge and skills also helps explain this fluidity (2009, as cited in Baha et al., 2020). The profile locates caution and uncertainty within a continuing process of professional formation.

The Pragmatic, Functional, and Solution-Oriented typology brings together statements that construct designer identity through problem solving, visual communication, and meeting client needs rather than primarily through artistic belonging. This pattern is consistent with the social and self-perceptual framework through which Kunrath et al. (2020) explain how designers understand themselves

professionally. Özdal's (2024) finding that AI-assisted tools accelerate design processes and increase efficiency parallels statements describing AI as “just a tool.” This ideal-typical profile indicates that relationships with AI are interpreted not only through emotional or ethical considerations but also through the functions and purposes of design activity.

Considering the four typologies together shows that statements about designer identity differ at the intersection of professional values, perceived control, and relationships with AI. This finding supports Bjorklund et al.'s (2020) argument that identity work is multifaceted and embedded in context within the specific setting of graphic design education. When professional identity and AI's effects on design are considered together, technological transformation emerges in students' accounts as a context for reassessing the meaning of becoming a designer, extending beyond a change in tools.

The study's contribution lies in bringing professional identity and technological transformation into the same analytical frame. Its findings are consistent with accounts of professional identity as dynamic and context-sensitive (Beijaard et al., 2004; Bjorklund et al., 2020). By examining this construction directly in the context of generative AI, the study offers an empirical response within graphic design education to gaps identified by Tracey and Hutchinson (2018) and Zhou et al. (2025). It thus connects two bodies of literature that have often been considered separately. Whereas the literature has largely developed along two separate lines, one on professional identity formation (Beijaard et al., 2004; Kunrath et al., 2020) and one on the effects of AI on design (Elgendy, 2024; Özdal, 2024; Zhou et al., 2025), the profiles developed here combine definitions of the designer, professional positioning, relationships with AI, perceived control, and future perceptions within single configurations. Compared with the identity narratives described by Bjorklund et al. (2020) and the algorithmic intimacy described by Azhar (2026), the added contribution is a typology in which orientations toward AI are interwoven with professional values and expectations of becoming a designer, and in which identity is treated as fluid across statements rather than fixed within persons.

The educational significance of these findings can also be considered through existing work on reflection and professional formation. Azhar's (2026) proposed pedagogy of algorithmic reflexivity provides a basis for helping students develop informed positions on authorship, autonomy, and ethics. Reflective writing, as proposed by Tracey et al. (2014), can support movement from describing experiences to interpreting their professional meaning, especially among students whose statements approach the Student/Aspiring Designer orientation and who have not established a clear direction for the future. Baha et al. (2020) similarly propose that educators and students jointly construct a plural and dynamic understanding of design. These connections give a pedagogical context to the different orientations identified in the present study.

The findings also have implications for how identity development is investigated over time. The slow consolidation of identity described by Kunrath et al. (2017) provides a rationale for following students across educational stages, while the limited synthesis identified by Zhou et al. (2025) supports considering professional identity and AI's effects within a shared framework. Such perspectives help situate the study's recommendations within continuing debates about professional learning and technological transformation.

4.1. Limitations

The findings should be interpreted in light of several limitations. First, the study is based on handwritten responses to structured open-ended forms from 18 undergraduate graphic design students in a medium-sized faculty of fine arts in Türkiye. This single-institution context requires readers to consider contextual characteristics when judging transferability to other design education

settings. Second, the written-form procedure used in this study did not include follow-up questions, which may have limited access to the reasoning and contextual meanings underlying some statements. Third, because the instrument's five sections provided the deductive overarching categories, the framework may have limited the visibility of meaning patterns falling outside it. Fourth, responses varied in length and detail, which may have resulted in some categories being represented by fewer or shorter quotations.

In addition, the instrument's content validity relied on the views of two specialists, one in the subject area and one in qualitative research methods; a broader expert panel could have strengthened validity. Some analytical dimensions of the ideal-typical profiles were likewise illustrated by statements from a limited number of participants. This uneven representation should be considered when interpreting the patterns in the dataset. The typologies also simplify attitudes that may vary by context or reflect more than one profile. The cross-sectional design also prevents direct observation of how these statement patterns change throughout education.

4.2. Implications and Recommendations

Several recommendations for future research follow from these limitations. First, examining the four typologies in larger samples drawn from different institutions through semi-structured interviews would help assess their credibility, transferability, and explanatory value across educational contexts. Second, longitudinal studies should reassess students at different stages of education, from their first year to graduation, using the same structured form or interview protocol to trace changes in designer identity. Such designs could make the gradual consolidation of identity visible within graphic design education. Third, future research should continue to consider professional identity alongside AI's effects on design processes within a shared framework. This would support a more integrated understanding of how students interpret technological change as they become designers.

For design education practice, the findings indicate that students' statements express differing orientations toward AI rather than a single homogeneous attitude; curriculum design should therefore take these four orientations into account. Approaches centered on algorithmic reflexivity can help students develop an informed position on authorship, autonomy, and ethics. Reflective writing can also help students move from describing experiences to making sense of their professional significance, particularly when their statements align with the Student/Aspiring Designer orientation and they lack a clear future direction. Finally, design educators and students should jointly develop a plural and dynamic understanding of design. These practices can support students in positioning their designer identities more consciously in the context of AI.

5. Conclusion

This study examined how graphic design students construct their designer identities within a changing design context. The findings show that participant statements can be meaningfully organized around four ideal-typical profiles: Technology-Integrated, Innovative, and Proactive; Traditional, Emotion/Art-Oriented, and Protective; Process/Development-Oriented and Cautious Student/Aspiring Designer; and Pragmatic, Functional, and Solution-Oriented. These profiles do not divide participants into fixed groups. Instead, they make visible the principal configurations of meaning connecting designer identity, professional ambitions, relationships with AI, understandings of control and creativity, and expectations for the future. Different statements from the same participant can align with more than one profile, highlighting the context-sensitive and fluid character of designer identity. The study's distinctive contribution is to examine this dynamic construction

directly in the context of generative AI and bring professional identity and the effects of AI into a shared analytical framework for graphic design education. The findings respond to the gap identified at the outset, namely the limited attention to professional identity development in design (Tracey & Hutchinson, 2018) and the limited synthesis of AI's effects on designer identity (Zhou et al., 2025). By showing that students' professional values, perceived control, and relationships with AI are articulated within the same accounts, the study indicates that AI appears in students' accounts not only as a change of tools but also as a context in which they renegotiate what it means to become a designer.

6. Declarations

6.1. Conflict of interest

The authors declare that there is no conflict of interest to disclose.

6.2. Funding

The authors declare that the study received no external funding.

6.3. Author contributions (CRediT)

Aytaç Özmutlu: Conceptualization; Methodology; Software; Validation; Formal analysis; Investigation; Resources; Data curation; Writing—original draft; Writing—review & editing

Emel Bayrak Özmutlu: Conceptualization; Methodology; Software; Validation; Formal analysis; Investigation; Resources; Data curation; Writing—original draft; Writing—review & editing

All authors reviewed the results and approved the final version of the manuscript.

6.4. Data availability statement

The anonymized data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to participant confidentiality and consent restrictions.

6.5. Ethics approval

Ethics committee approval was not obtained for this study. Ethical principles were observed throughout the research process. Data were collected through written forms completed voluntarily by students. Participant confidentiality was protected by excluding identifying information from the analysis dataset and using codes (K1–K18) when reporting findings.

6.6. Use of artificial intelligence (AI) tools

Artificial intelligence tools were used for general writing formatting, language checks, internal consistency checks, and bibliography checks. The authors reviewed and edited all content and take full responsibility for the publication.

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Understanding barriers to teaching political and controversial issues holistically: The hegemonic barrier model from a Gramscian perspective

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ABSTRACT

Teaching political and controversial issues promotes students' critical thinking, democratic deliberation, and civic engagement. Nonetheless, educators encounter a range of legal, curricular, institutional, cultural, and professional constraints. This conceptual article introduces the Hegemonic Barrier Model to elucidate the conditions under which these challenges become hegemonic and influence classroom decision-making. Employing a theory-driven synthesis, the study reorganizes patterns identified in the literature through the lens of Gramsci's concepts of hegemony, coercion and consent, the integral state, common sense, good sense, and the pedagogical role of intellectuals. It delineates three interrelated domains of hegemonic operation: structural-regulatory, institutional-societal, and cultural-ideological. Furthermore, it conceptualizes intellectual-pedagogical mediation as a bidirectional process through which teachers may reproduce, negotiate, resist, or transform these influences. The article proposes six analytical manifestations: legal constraints, curriculum, school and societal pressures, historical narratives, teacher identity and professional subjectivity, and assumptions regarding students' political agency. Rather than treating these constraints as discrete barrier categories, the analysis examines how power relations, legitimacy boundaries, institutional expectations, and teachers' professional judgments interact to shape pedagogical choices within specific contexts. Consequently, the model functions as a relational analytical framework rather than a causal or prescriptive instructional model. The study concludes that a difficulty attains a hegemonic character when it is embedded within asymmetrical power relations, engenders the selective legitimization of particular forms of knowledge, narratives, or subjectivities, is sustained through varying combinations of coercive and consensual mechanisms, and is translated via intellectual-pedagogical mediation into a constriction of opportunities for knowledge acquisition, discussion, or participation. The article advocates for enhancing legal clarity, curricular flexibility, institutional protection, professional autonomy, and teacher education. Future research should empirically test the model's applicability across diverse contexts and incorporate negative and contrasting cases.

KEYWORDS: Political and controversial issues; Hegemony; Hegemonic barrier; Pedagogical mediation; Teacher subjectivity

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1. Introduction

Political and controversial issues involve ongoing disputes over rights, values, identities, public policies, or historical interpretations, with parties holding different defensible views (Dearden, 1981; Stradling, 1984). Their controversial nature varies with historical, political, and social contexts (Baildon & Afandi, 2014). Here, "political and controversial issues" refer to public matters and power relations that provoke disagreement among social groups. This definition does not legitimize hate speech or views that violate fundamental rights merely because they are contested.

Teaching political and controversial issues creates a crucial space for democratic citizenship education that goes beyond knowledge transmission (Hess, 2009). In pluralistic, structured settings (Avery et al., 2013), students reason about public matters (Hess & McAvoy, 2015), encounter diverse perspectives (Avery et al., 2013), develop evidence-based arguments (Hess, 2009), and engage in democratic deliberation (Avery et al., 2013; Lo, 2023). These issues thus serve not only as curriculum content but also as a learning domain that promotes critical thinking, mutual respect, and democratic participation.

The realization of this pedagogical potential depends on teachers having enough professional freedom to address political and controversial issues safely, pluralistically, and manageably. This freedom is shaped by legal and administrative rules, curricular priorities, school and societal expectations, historical narratives, teachers' professional perspectives, and assumptions about students' political agency. In some contexts, these factors restrict topic selection, discussion scope, and student participation.

Key challenges include legal-political constraints, curricular demands, and institutional-societal expectations. Beyond explicit prohibitions, uncertainty about freedom of expression and professional responsibility leads teachers to anticipate complaints and sanctions (Hess, 2004; Ho et al., 2014; Stitzlein, 2024). Curricular density, limited instructional time, centralized exams, and favored narratives shape which issues are taught (Foster, 2014; Misco & Tseng, 2018; Yavaş et al., 2024). Additionally, expectations from administrators, colleagues, parents, and media influence teachers' risk assessments (Dunn et al., 2019; Karousiou et al., 2025; Pollock et al., 2022).

Challenges also stem from cultural assumptions and pedagogical factors. Official historical narratives, collective memory, and identity relations often legitimize certain interpretations while marginalizing others (Barton & McCully, 2007, 2012). Teachers' preparation, self-efficacy, emotions, identities, beliefs, and role perceptions influence how these factors affect classroom decisions (Gindi et al., 2021; Philpott et al., 2011). Moreover, the belief that younger students cannot understand political issues may restrict their engagement opportunities (Brophy & Alleman, 2009; Han et al., 2026; Kelly & Brooks, 2009). Therefore, these challenges cannot be attributed solely to external regulations or individual traits.

Teaching challenges differ by country, education system, school level, and subject (Baki Pala, 2020; Hanna et al., 2026; Zembylas & Kambani, 2012). The same regulations may be interpreted differently across school cultures. Factors like administrative support, collegial solidarity, and families valuing democratic discussion can enhance teachers' autonomy (Baki Pala, 2020; Karousiou et al., 2025). In contrast, social polarization, unclear complaint procedures, and inadequate professional training can limit it (Hanna et al., 2026; Kuş & Öztürk, 2019; Öntaş et al., 2021). These relational influences can either reinforce or undermine each other depending on the context.

Existing research often classifies difficulties as legal, curricular, institutional, cultural, or individual. While these categories identify visible sources, they do not explain how difficulties interrelate,

become dominant, and influence teachers' decisions. For example, legal uncertainty may be legitimized within a school culture, causing teachers to self-restrain through risk assessment, whereas in supportive institutions, the same uncertainty may have little effect. Therefore, a framework is needed to explain the interaction among coercive regulations, institutional expectations, social consent, ingrained assumptions, and pedagogical mediation, rather than merely listing difficulties.

This article applies Antonio Gramsci's theory of hegemony to examine instructional challenges as manifestations of power relations in education. Key concepts—hegemony, coercion and consent, political and civil society, common sense, good sense, and the intellectuals' pedagogical role (Gramsci, 1971; Mayo, 2011; Thomas, 2009)—are used to analyze how knowledge, narratives, identity, and behavior are legitimized and naturalized in classrooms through teachers' judgments. It also recognizes that teachers are active agents who can negotiate, resist, question, or reproduce hegemonic assumptions.

The article proposes the Hegemonic Barrier Model by integrating Gramscian concepts with patterns observed in teaching political and controversial issues across various national and educational contexts. The model identifies three domains—structural-regulatory, institutional-societal, and cultural-ideological—where power relations arise, mediated intellectually and pedagogically to influence classroom decisions. It views legal constraints, curriculum, school and societal pressures, historical narratives, teacher identity and professional subjectivity, and assumptions about students' political agency as six interconnected analytical categories for examining these relations.

The model does not consider all legal, institutional, cultural, or pedagogical constraints inherently hegemonic. A difficulty becomes a hegemonic barrier when, within unequal power relations, it presents certain knowledge, opinions, or narratives as natural and legitimate while dismissing evidence-based alternatives as inappropriate or risky. This legitimacy boundary influences teachers' professional judgment, limiting pluralistic discussion. Rather than creating new barrier categories, the model explains how difficulties gain hegemonic status, become legitimized, and affect pedagogical decisions.

This article examines when teachers' challenges in addressing political and controversial issues become hegemonic barriers, based on Gramsci's theory of hegemony. It also explores how these barriers emerge and affect pedagogical decisions through the interaction of structural, institutional, cultural dynamics, and teachers' intellectual mediation.

The next section presents the study's conceptual background. The Argumentation section develops the Hegemonic Barrier Model, explains its criteria, outlines the research design and analytical procedure, and examines its six analytical manifestations. The Discussion evaluates the model's theoretical contributions, limitations, and implications for research and practice. The Conclusion summarizes the model's central argument.

2. Conceptual Background¹

2.1. Hegemony, Coercion, and Consent: The Relational Operation of Domination

Gramsci (1971) argues that modern power depends less on repression and more on securing social consent (Femia, 1981; Thomas, 2009). Hegemony is the intellectual and moral leadership by which a

¹ To construct a coherent framework of Antonio Gramsci's theory on hegemony and education—based on his fragmented prison notes (1971)—contemporary secondary literature was also used. Key analyses include Thomas (2009), who offers a philological reconstruction of Gramsci's hegemony and integral state; Mayo (2011, 2015), who examines the hegemony-education link; Entwistle

group's worldview is accepted as the common interest. This domination extends beyond economics and politics, serving as a multilayered mechanism that legitimizes and shapes accepted knowledge.

Gramscian hegemony involves two elements: coercion and consent. Coercion includes legal regulation and state sanctions, while consent refers to the acceptance of the existing order as inevitable (Gramsci, 1971). Consent is historically shaped through institutions and daily practices, not spontaneous. The balance between coercion and consent varies; sanctions dominate during legitimacy crises, whereas cultural means maintain order without overt repression (Thomas, 2009). Hegemony is never complete and must be continually re-established, making it open to contestation and change.

Education exemplifies the interplay of coercion and consent. Schools do not merely transmit knowledge; they shape accepted truths and values. Entwistle (2009) cites Gramsci's view of hegemonic relations as pedagogical processes. However, schools are not closed systems imposing dominant ideas unilaterally. As Mayo (2011) observes, educational spaces are contested sites where assumptions can be reinforced or challenged. Thus, schools both sustain hegemonic values and allow alternative discourses to emerge.

The dialectical relationship between coercion and consent explains teachers' struggles with controversial issues. Challenges go beyond legal restrictions to include institutional assumptions about safe or risky topics, which often lead to self-censorship. Conversely, institutional support, professional protections, and critical pedagogical judgment can counteract these effects. These mechanisms interact differently across contexts, sometimes reinforcing, transforming, or neutralizing one another.

In the Hegemonic Barrier Model, coercion and consent are fluid, appearing in varying forms and intensities across all three domains. Legal constraints may be normalized by social legitimacy, institutional expectations enforced through administrative sanctions, and cultural assumptions can prompt self-restraint via anticipated reactions. Thus, hegemonic barriers are relational processes shaped by shifting blends of coercion and consent, influencing pedagogical decisions and remaining open to negotiation and scrutiny. This framework supports the model's other Gramscian concepts.

2.2. The Integral State: Political Society, Civil Society, and Education

Gramsci's concept of the state goes beyond government, bureaucracy, law, and security forces. He views the modern state as a complex network of relations, including political and administrative institutions that enforce sanctions, alongside cultural, moral, and educational relations that foster social consent (Gramsci, 1971). Thomas (2009, p. xxii) notes that political society and civil society form an organic unity within Gramsci's "integral state." Although analytically distinct, these spheres are not sharply separated or independent in reality (Gramsci, 1971; Thomas, 2009).

Political society encompasses the state's visible legal, administrative, and coercive powers, including laws, courts, security forces, bureaucracies, and public authorities. Civil society consists of institutions and relationships shaping daily life and social norms, such as schools, families, religious groups, media, trade unions, professional bodies, and cultural associations. However, equating political society solely with coercion and civil society solely with consent misrepresents Gramsci's concept of the relational state. Political and legal systems require social legitimacy, while civil society institutions may exercise administrative control, exclusion, and sanctions. Gramsci's formula "state = political society + civil society" and his description of the state as "hegemony

(2009), who addresses the tension between Gramsci's radical politics and traditional schooling; and Crehan (2002, 2016), who provides conceptual mappings.

protected by the armour of coercion" (Gramsci, 1971, p. 263) demonstrate that coercion and consent are intertwined and mutually reinforcing within the integral state.

The integral-state perspective shows that Gramsci's concept of the educative state extends beyond formal institutions. The state functions as a moral-pedagogical force shaping behavior, values, and social understanding (Gramsci, 1971; Thomas, 2009). Schools are key sites where these dynamics intersect, connected to regulatory power through laws, policies, curricula, and oversight, while also fostering social consent via school culture, teacher-student interactions, textbooks, family expectations, and notions of legitimate knowledge (Entwistle, 2009; Gramsci, 1971; Mayo, 2015). Therefore, schools should be viewed not only as parts of political or civil society but as educational spaces where these relations are concretized.

The integral-state perspective explains that challenges faced by teachers of political and controversial issues arise from interactions between social and educational spheres. Legal regulations and administrative practices can restrict teachers' pedagogical scope, while school culture, parental expectations, media discourses, and social assumptions may support, challenge, or reinforce these limits. The curriculum is not merely a technical document by political authorities but a site where state regulatory power intersects with social understandings of knowledge, values, and citizenship.

The Hegemonic Barrier Model's domains do not directly align with political and civil society. The structural-regulatory domain includes law, policy, curricula, oversight, and coercive power; the institutional-societal domain involves expectations, legitimacy, support, and pressure from schools, families, media, and other actors; the cultural-ideological domain examines naturalization processes that transcend these distinctions. These domains serve as analytical tools to study intersecting forms of coercion and consent in education. Their influence on classroom decisions is analyzed separately through intellectual-pedagogical mediation.

2.3. Common Sense and Good Sense: Producing and Questioning Hegemonic Meanings

A central element of Gramsci's hegemony theory is common sense—the thoughts, values, and explanations people use to interpret daily life. Common sense is a fragmented worldview combining ideological, cultural, religious, and political elements from different historical periods with everyday experience (Crehan, 2002, 2016; Gramsci, 1971). It often includes contradictory ideas and should be understood not as fixed truths but as a historically accumulated, heterogeneous set of meanings used in daily life.

The fragmented nature of common sense makes it a key site of hegemonic struggle. Hegemonic groups do not impose a fixed worldview but shape social consent by selecting and linking existing values, fears, expectations, and explanations to support a specific social order. Historically constructed social relations, political preferences, and authority forms thus appear "ordinary," "natural," or "inevitable" (Crehan, 2002, pp. 99-100; Crehan, 2016, pp. 51-52; Gramsci, 1971, p. 12). Common sense is neither a uniform consciousness passively reflecting dominant ideology nor a collection of false ideas. It contains the experiences, memories, and contradictions of various social groups, both supporting the existing order and harboring critical elements that reveal its limits (Crehan, 2002, 2016; Gramsci, 1971). Hence, hegemonic struggle focuses not on eradicating common sense but on interpreting its elements.

Gramsci identifies "good sense" within common sense as elements arising from everyday experience that enable questioning of established assumptions (Gramsci, 1971). Rather than a fully formed worldview, good sense represents the critical potential of common sense. Crehan (2016, p. 47) terms

this the "healthy nucleus," which helps individuals connect daily problems to broader social and structural issues. However, good sense does not naturally develop into systematic critical consciousness; its fragmented elements require cultivation through conceptual tools, collective experiences, and pedagogical relations (Crehan, 2002; Gramsci, 1971). Thus, good sense entails critically examining the historical and social roots of everyday assumptions instead of adopting a ready-made worldview.

Education is a key social sphere where common sense is both reproduced and challenged. It shapes judgments about valid knowledge, legitimate values, and reasonable social explanations. Schools sustain the cultural continuity of dominant common sense, but when students connect academic knowledge to everyday experience, critically examine assumptions, and develop alternative explanations, education enhances the rational elements within common sense. Since hegemony requires constant renewal and defense, education is not solely a reproductive process (Entwistle, 2009).

This article uses common sense to explain how cultural-ideological factors complicate teaching political and controversial issues. Treating certain historical narratives, political values, and social assumptions as unquestionable truths creates invisible boundaries that determine which issues are seen as legitimate, appropriate, or risky. Similarly, excluding childhood from political life or assuming younger students cannot engage meaningfully with political topics naturalizes specific views of childhood and citizenship.

Such assumptions become hegemonic not merely due to their prevalence or tradition but because, within unequal power relations, they naturalize and legitimize specific knowledge and subjectivities while dismissing alternatives as inappropriate or unthinkable, thereby restricting pedagogical discussion. The model's cultural-ideological domain explores these processes of naturalization and legitimation. Good sense is not a fully developed counter-hegemonic structure but a critical potential arising from contradictions within common sense. Its emergence in the classroom relies on teachers' intellectual mediation, students' experiences, and evidence-based critical dialogue.

2.4. Intellectuals, Pedagogical Mediation, and the Transformative Potential of Education

A key aspect of Gramsci's theory of hegemony is his broad definition of intellectuals. He does not restrict intellectuals to academics or writers; rather, everyone engages in intellectual activity, though not all are intellectuals. İnan (2025) contends that academic titles alone do not define intellectuals. Instead, they are distinguished by producing ideas, communicating and teaching them, and addressing social problems. Intellectuals are identified by their roles in organizing, legitimizing, and directing social relations. They interpret and shape social worldviews and mediate the production of social consent (Gramsci, 1971; İnan, 2025; Mayo, 2011).

Within this framework, Gramsci distinguishes traditional intellectuals, who view themselves as independent of social classes and historical struggles, from organic intellectuals, who emerge from a social group's lived experience and unify its fragmented ideas and experiences (Gramsci, 1971).

The concept of the organic intellectual does not inherently imply a progressive or counter-hegemonic stance. Dominant social groups also produce organic intellectuals who promote their worldviews. What matters is the social experiences emphasized, the worldview articulated, and the hegemonic interests served (Gramsci, 1971; Thomas, 2009).

Gramsci links intellectuals, hegemony, and pedagogy, arguing that hegemony is sustained not only by political and legal institutions but also through pedagogical relations where people learn to interpret the world and accept legitimate knowledge and values. This process is reciprocal: educators

learn from learners, who actively influence the relationship with their experiences. Mayo (2011) extends Gramsci's concept of counter-hegemonic struggle by incorporating Freire's praxis, which rejects passive "banking education" and seeks to empower individuals as active agents who question and reshape their social realities.

This article builds on the Gramscian framework by applying Benner's (2023) non-affirmative education theory and Mäkiharju and Smeds-Nylund's (2025) concept of pedagogical mediation to teachers. It shows how teachers interpret policies, curricula, and social contexts, transforming them into classroom decisions. Teachers are neither passive transmitters nor fully autonomous but navigate legal, institutional, and cultural constraints. Pedagogical mediation is a relational process where external demands are reshaped through professional judgment rather than directly reflected in teaching.

Teachers' institutional roles do not inherently make them organic or transformative intellectuals. They may either reinforce dominant knowledge hierarchies or, depending on context, challenge these boundaries through evidence and diverse experiences. Giroux (1988, p. 121) defines a "transformative intellectual" as a teacher who critically evaluates the values and social impacts of pedagogy rather than merely delivering curricula. Unlike Gramsci's organic intellectual, Giroux (1988) emphasizes teachers' roles in fostering critical thinking, democratic participation, and public dialogue by creating spaces for students to critically assess diverse perspectives.

The transformative potential of education is not a sudden change driven by a single teacher's will. In Gramsci's "war of position," transformation occurs through prolonged struggles within civil society, cultural practices, and everyday meaning-making (Gramsci, 1971, pp. 238-239). Teachers' pedagogical mediation is thus a limited but meaningful intervention constrained by structural and institutional factors, fostering critical thinking, dialogue, and alternative meanings. Expecting teachers to overcome legal insecurity, institutional pressure, or physical threats through individual courage alone oversimplifies and unfairly burdens them with responsibility for hegemonic relations.

Within this framework, intellectual-pedagogical mediation is a cross-cutting process that translates influences from the other three domains into classroom decisions through teachers' judgment. This process both reproduces established boundaries and enables negotiation, resistance, and transformation. Its detailed role is explained in the model-development subsection below.

3. Argumentation and Model Development

The Hegemonic Barrier Model is an original analytical framework developed in this article, based on Gramsci's concepts of hegemony, coercion and consent, the integral state, common sense, good sense, and the pedagogical role of intellectuals. It explains the relational challenges in teaching political and controversial issues.

The model identifies three elements: domains of hegemonic operation, intellectual-pedagogical mediation, and analytical manifestations of barriers. Domains are social and educational spheres where power relations around teaching political issues are formed and legitimized. Intellectual-pedagogical mediation is how teachers interpret and apply these influences in classroom decisions. Analytical manifestations are the tangible forms these processes take in practice. The model focuses on the pedagogical decision to address or limit political or controversial issues and the network shaping that decision, rather than on individual teachers, students, institutions, or regulations.

The model analyzes hegemonic operations in three domains: structural-regulatory (laws, policies, oversight shaping teachers' actions), institutional-societal (social actors influencing views on

political issues), and cultural-ideological (accepted knowledge, narratives, and identity assumptions).

These three domains are analytical distinctions, not fixed social layers, highlighting different modes of operation. Coercion and consent function through overlapping relations between political and civil society. Legal, institutional, and cultural elements may legitimize power asymmetries, producing hegemonic barriers that are sustained and mediated pedagogically. Domain interactions can intensify this process, though not all domains are always involved.

Intellectual-pedagogical mediation is a cross-cutting process that shapes how teachers interpret structural, institutional, and cultural influences in their classroom practices. Filtering regulations, curricula, and social norms through their knowledge, identity, and emotions, teachers may avoid or superficially address controversial topics or, alternatively, promote diverse perspectives and critical engagement. This mediation involves resistance, transformation, and reproduction of hegemonic norms.

This bidirectional process prevents pedagogical decisions from being viewed as direct, mechanical responses to external conditions. The same legal regulation, curriculum, or institutional expectation can produce different outcomes depending on teachers and school contexts. Factors like teachers' professional stance, issue knowledge, institutional support, student characteristics, and perceived risk intensity influence how structural, institutional, and cultural elements shape classroom practice. Teachers' diverse strategies across political contexts—such as avoidance, risk-taking, private discussions, emotional engagement, or critical dialogue—underscore the contextual nature of mediation (Hanna et al., 2026).

The model's six analytical manifestations are not mutually exclusive barrier categories of equal ontological status but serve as entry points for analyzing hegemonic relations. Each manifestation is mainly linked to one domain but can also appear across multiple domains. Therefore, primary associations indicate the initial analytical focus, not a fixed barrier assignment.

Within this framework, intellectual-pedagogical mediation differs from the analytical focus on teacher identity and professional subjectivity. Teacher identity and subjectivity are analytical entry points when factors like professional preparation, self-efficacy, beliefs, emotions, or role perceptions are central to the study. While teacher subjectivity may be the primary focus in some cases, pedagogical mediation is a constant process in all cases within the model.

3.1. Distinguishing Criteria and Analytical Boundaries of a Hegemonic Barrier

This article defines a barrier as a difficulty that restricts the introduction of political and controversial issues in the classroom, their pluralistic treatment, or student participation. A hegemonic barrier is a relational process that legitimizes certain knowledge, opinions, narratives, or subjectivities within asymmetrical power relations, rendering alternatives invisible, inappropriate, or risky, and influencing pedagogical decisions. While every hegemonic barrier is an instructional barrier, not all instructional barriers are hegemonic. To classify a difficulty as hegemonic, all four criteria must be met, though they may arise at different times, levels, or through various actors.

The first criterion links difficulty to power imbalances where parties lack equal influence over decisions and boundaries. Personal factors like a teacher's reluctance or limited knowledge do not indicate hegemony. Instead, power arises from legal authority, institutional roles, dominant narratives, or accepted social definitions that shape outcomes. Power extends beyond authority to agenda-setting and normalizing views while burdening alternatives. As Entwistle (2009) explains, dominant groups control schools by legitimizing their cultural assumptions and defining valid

knowledge through the curriculum, resulting in classroom asymmetry and unilateral control over educational value.

The second criterion involves selective legitimation and delegitimation. A difficulty becomes hegemonic when it frames certain knowledge, narratives, identities, or subjectivities as natural, neutral, safe, or educationally appropriate, while portraying evidence-based alternatives as controversial or inappropriate. This can occur through explicit topic bans, presenting specific historical interpretations as the only valid narrative, erasing certain social groups' experiences, assuming children cannot engage with political issues, or labeling teachers' facilitation of pluralistic discussions as biased. A dominant narrative alone is not hegemonic; it becomes a barrier when it systematically excludes alternative evidence and diverse experiences. As Entwistle (2009) notes, hegemony gains power by making dominant boundaries seem like natural social common sense. When successful, dominant narratives appear neutral, while alternative views are dismissed as lacking legitimacy.

The third criterion examines coercive and consent-based mechanisms that define legitimacy boundaries, including sanctions, institutional expectations, social consent, and teachers' perceived risks. Not all mechanisms apply in every case; some rely on explicit sanctions, others on social norms. According to Entwistle (2009) and Gramsci (1971), these mechanisms combine to normalize certain pedagogical choices while marginalizing others. This criterion highlights the power and risk dynamics influencing teachers' decisions rather than the decisions themselves.

The fourth criterion is that these mechanisms cause pedagogical narrowing through teachers' intellectual mediation. Teachers interpret sanctions, institutional expectations, social reactions, and assumptions using their professional knowledge, experience, identity, emotions, and risk assessment. This interpretation can lead to self-restraint, resulting in issues being omitted, superficially addressed, framed within dominant narratives, stripped of alternative evidence, quickly closed, or discussed in ways that limit some students' participation. However, the same structural, institutional, or cultural conditions do not produce identical outcomes for every teacher. Teachers may reproduce, negotiate, mitigate, or critically examine these influences. Thus, self-restraint is not the hegemonic mechanism itself but a pedagogical choice arising from teachers' interpretation; pedagogical narrowing is the observable effect on knowledge, discussion, and participation. Entwistle (2009) similarly argues that teachers actively interpret external influences through professional judgment rather than passively implement them. Therefore, hegemonic barriers in the classroom result from a dynamic process shaped by teachers' professional judgment and mediation.

The four criteria can be illustrated through a hypothetical scenario. A teacher's choice to avoid a recent historical issue does not alone indicate a hegemonic barrier. However, the official narrative's dominant role in shaping discussion boundaries reveals power asymmetry. Portraying alternative evidence as inappropriate or risky reflects selective legitimation. Anticipating reactions from administrators or parents, or the threat of investigation, maintains this boundary. The teacher's risk assessment and self-restraint represent the pedagogical decision, while excluding alternative sources and limiting discussion to the dominant narrative constitute pedagogical narrowing. The hegemonic barrier emerges from the interaction of these elements.

The systematic nature of pedagogical narrowing does not mean the same boundary yields identical outcomes for every teacher, school, or issue. Instead, systematicity indicates that constraints stem from broader structures of power and legitimacy, not isolated personal preferences. When certain issues are consistently deemed risky across time and settings—prompting teachers to anticipate similar reactions or sanctions and repeatedly excluding alternative views—this pattern may reflect

such a relationship. However, repetition alone does not prove hegemony; the pattern must meet all four criteria outlined above.

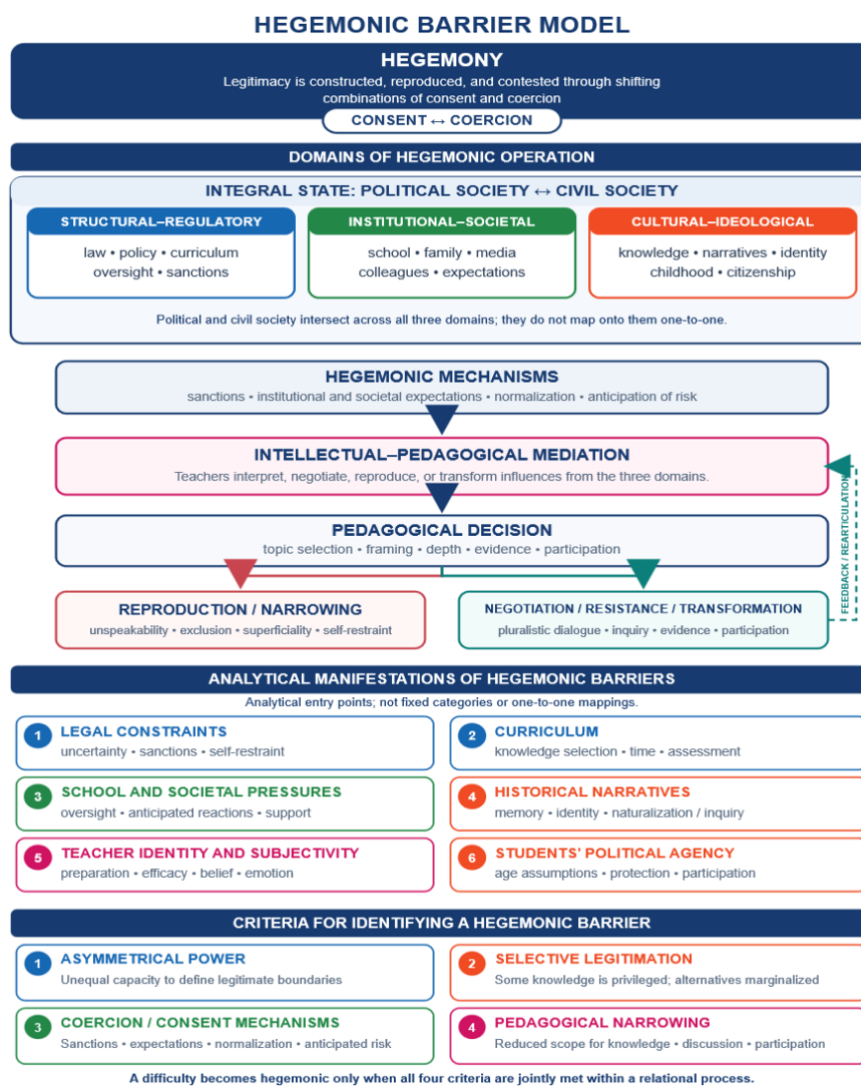
The model does not see all pedagogical boundaries as negative or hegemonic. Boundaries that shield students from hate speech, discrimination, misinformation, political indoctrination, or developmentally inappropriate trauma are not hegemonic simply because they limit discussion. Similarly, a teacher's rejection of unsupported claims, refusal to assign equal epistemic value to all views, or adjustment of language and scope to protect students aligns with pluralism. Pluralistic teaching involves evaluating different views based on evidence, reasoning, human rights, and mutual respect—not accepting all claims as equally valid (Hess & McAvoy, 2015). A protective or ethical boundary becomes hegemonic only when selectively used to silence legitimate political views and enforce an unquestioned dominant narrative.

Avoidance and silence should not be viewed as hegemonic reproduction without context. Teachers may avoid issues due to internalized dominant assumptions or to protect students, themselves, and the class from trauma or real threats. Examples from Indonesia and southern Thailand show that silence can signify care, self-protection, and physical safety (Hanna et al., 2026). The barrier arises not from avoidance itself but from violence, sanctions, institutional insecurity, and enforced silence that make avoidance necessary. This distinction prevents blaming teachers for broader power dynamics.

A teacher's lack of pedagogical knowledge or self-efficacy alone does not create hegemonic barriers. While inadequate professional preparation is a common challenge across subjects, it can reinforce hegemonic practices when combined with dismissing political issues, uncritically transmitting dominant narratives, or restricting certain student perspectives. Therefore, teacher competence should be understood not as fixed personal shortcomings but in relation to structural support, institutional safeguards, cultural assumptions, and professional experience.

In future empirical research using this model, findings should not be attributed to a single domain based solely on their apparent source. Analysis must first identify the constrained issue, knowledge, perspective, or subjectivity, then examine the structural, institutional, and cultural conditions that establish the boundary, the legitimizing mechanisms, the teacher's interpretation, and the resulting pedagogical outcome. Rather than asking, "To which domain does this finding belong?" analysis should ask, "Through which relations and mechanisms does this difficulty become a hegemonic barrier?" Associating a finding with multiple domains reflects the model's relational nature, not categorical ambiguity.

A hegemonic barrier is a relational process that creates selective legitimation within unequal power dynamics, maintained through coercion and consent, and limits discussion via pedagogical mediation. This process is open-ended; active engagement from teachers and students can foster negotiation and change. Figure 1 depicts the model's relational structure, connecting the three domains of hegemonic operation, intellectual-pedagogical mediation, and six analytical manifestations.

Figure 1 *The hegemonic barrier model*

3.2. Conceptual Approach

3.2.1. Conceptual Research Design and Analytical Procedure

This article presents the Hegemonic Barrier Model, a theoretical framework based on Gramsci's hegemony theory, to explain the challenges teachers face when addressing political and controversial issues. The model is an analytical tool—not an instructional or empirically tested causal model—used to examine power relations and mechanisms that give these challenges a hegemonic nature. Instead of generating new data, the article synthesizes existing literature to clarify these dynamics. It is a theory-driven conceptual synthesis, not a systematic review or meta-synthesis, aiming to establish new explanatory links (Jaakkola, 2020).

3.2.2. Source Base and Initial Classification

The model builds on existing classifications of teaching difficulties from the literature (Baki Pala, 2020; Günal, 2016; Onganer, 2025; Zembylas & Kambani, 2012). These studies initially categorized challenges in teaching political and controversial issues into six areas: lack of legal safeguards; curriculum; school and society; emotionally charged history; teachers' education, identities, and beliefs; and students' political subjectivity. This classification served as a preliminary framework for reconceptualization rather than the model's final structure.

3.2.3. Analytical Procedure

These areas were not seen as fixed, independent obstacles. Following Lukka and Vinnari's (2014) distinction and Jaakkola's (2020) conceptual design, the empirical literature served as domain theory, while the Gramscian framework provided method theory to transform this knowledge. Initial areas were reconsidered to link fragmented difficulties in the literature with conceptual clarity. Analytical constructs representing relational operations replaced rigid categories, shifting from descriptive classification of visible challenges to a model explaining how these challenges become hegemonic barriers affecting pedagogical decisions.

Legal safeguards were reframed as constraints, including prohibitions, uncertainty, sanctions, and self-restraint. The curriculum served as a selective framework shaping legitimate, teachable issues amid content and time pressures. Challenges arose from administrators, colleagues, parents, media, and the environment, acting as sources of pressure or support. Emotionally charged history was structured by narratives shaped by collective memory and identity.

Difficulties in teacher education, identity, and beliefs were reframed as teacher identity and professional subjectivity, emphasizing the interaction among professional preparation, self-efficacy, emotion, social identity, belief, and institutional role. Age-related challenges were viewed not as cognitive limitations but as issues of students' political agency, challenging the notion that childhood is apolitical and excluded from public life. This reframing led to six analytical manifestations.

3.2.4. Theoretical Selection

Gramsci was chosen because the issues extend beyond individual traits or isolated legal, curricular, and institutional problems. Teaching boundaries operate through regulation, oversight, sanctions, institutional expectations, social assumptions, historical narratives, and professional self-monitoring. Therefore, the research needs a framework linking coercion and consent, the state and civil society, institutional regulation and everyday assumptions, as well as reproduction and potential pedagogical transformation.

Gramsci was selected not as the sole theorist with explanatory value but for his ability to analyze the state-civil society relationship, coercion and consent, the naturalization of dominant assumptions in common sense, and teachers' intellectual-pedagogical mediation within a unified relational framework. While other approaches—such as discourse and subjectivation, discipline, symbolic reproduction, ideological apparatuses, and critical pedagogy—also shed light on aspects of the problem, the choice is based on explanatory fit with the research question rather than theoretical superiority.

The selected Gramscian concepts do not aim to exhaustively represent Gramsci's intellectual legacy but were chosen for their relevance to the research problem. The resulting Hegemonic Barrier Model was presented in the previous section.

3.2.5. Research Ethics

This study complied with all rules stipulated in the Directive on Scientific Research and Publication Ethics of Higher Education Institutions. None of the actions listed under “Actions Contrary to Scientific Research and Publication Ethics,” the second section of the directive, were carried out. Because the study is a theory-directed conceptual synthesis based exclusively on published sources and does not involve human participants, personal data, or primary data collection, ethics committee approval was not required.

3.3. Analytical Manifestations of the Model

3.3.1. Analytical Manifestations

The analytical manifestations are not fixed, mutually exclusive categories at the same ontological level but serve as entry points for examining relational operations. The following subsections analyze each manifestation across three domains: hegemonic mechanisms, intellectual-pedagogical mediation, and pedagogical outcomes. Assigning a manifestation to a primary domain does not exclude others; it merely indicates the initial analytical focus.

3.3.2. Legal Constraints: Uncertainty, Risk of Sanction, and Self-Restraint

Legal challenges in teaching political and controversial topics arise not only from explicit bans but also from uncertainty about freedom of expression, teachers' professional duties, inconsistent enforcement, and unclear guidance. These issues lead to direct content restrictions, ambiguous rules, and teachers' fear of discipline despite no explicit prohibitions. Distinguishing these challenges prevents conflating legal regulations with their interpretations and expectations.

Research across countries shows that teachers' decisions to address political issues are shaped by education policy, law, and institutional support. In Turkey, Singapore, and China, teachers often avoid politically sensitive topics due to uncertainty about their acceptability (Ersoy, 2010; Ho, 2010; Misco, 2011). In the United States, regulations restrict discussions on race, gender, and sexual identity by limiting certain concepts, books, and content (Han et al., 2026; Stitzlein, 2024). Studies in Israel, Poland, and Cyprus reveal that fears of disciplinary action, dismissal, complaints, or being labeled biased—exacerbated by unclear guidelines and lack of institutional protection—are major deterrents (Karousiou et al., 2025; Ketko-Ayali et al., 2025; Skura et al., 2026). Thus, perceived risk of sanctions can influence professional judgment as much as actual penalties.

Legal constraints mainly operate within the structural-regulatory domain, where written rules, disciplinary procedures, administrative oversight, and sanctioning powers define teachers' professional scope. However, their pedagogical impact also depends on how school administrations interpret these rules, the effectiveness of complaint procedures, the level of institutional protection for teachers, and societal responses—engaging the institutional-societal domain. Over time, avoiding certain topics may become normalized as "safe," "neutral," or "professionally appropriate," giving legal boundaries cultural-ideological legitimacy.

These influences shape classroom decisions via intellectual-pedagogical mediation. Teachers weigh the regulation's scope, past complaints, institutional support, and perceived risk, which may lead them to avoid topics, soften language, hold superficial discussions, or seek limited professional autonomy. Thus, self-restraint is not an automatic effect of legal regulation but a potential outcome when structural boundaries are interpreted through institutional, cultural, and professional risk assessments. The varied responses among teachers and schools underscore the contextual nature of this mediation.

Not all legal constraints are hegemonic barriers. Clear, predictable, and proportionate regulations on discrimination, hate speech, political indoctrination, and teacher authority abuses protect democratic education. A legal boundary becomes hegemonic when uncertainty, selective enforcement, or disproportionate sanctions suppress evidence-based views and restrict pluralistic discussion.

3.3.3. The Curriculum: Selection of Knowledge and Scope for Pedagogical Action

In teaching political and controversial issues, the curriculum is more than a technical document organizing content. Its scope, priorities, assessment methods, and allowance for teacher

interpretation determine which political topics are taught, their coverage, and perspectives presented. The included issues and their framing shape students' political socialization, while a curriculum promoting justice, pluralism, and deliberation supports democratic reasoning development (Barton & Ho, 2022; Hess & McAvoy, 2015). Thus, the curriculum acts as a framework that selects specific knowledge and narratives and authorizes their classroom use.

Time, content, and assessment constraints limit curricular scope. Curricular density, mandatory outcomes, and pressure to cover required material reduce time for controversial issues (Hahn, 1998; Karousiou et al., 2025; Skura et al., 2026). Centralized exams and measurable outcomes often favor brief expository teaching over student-centered discussions (Alviar-Martin et al., 2008; Hanna et al., 2026; Misco, 2011). The shift toward exam-focused courses and practice tests also hinders in-depth exploration of political topics (Hess, 2009; Pace, 2011; Wills, 2007). Yet, time pressure alone does not explain avoidance; institutional views of academic achievement and teachers' curricular interpretations are also crucial.

The second dimension explores whether the curriculum's relationship with political issues creates a legitimizing or restrictive threshold. The same curriculum can be interpreted differently: some teachers link current issues to curricular goals, while others adopt a narrow view (Journell, 2017). Connecting issues to curricular objectives or professional duties legitimizes their inclusion as educational decisions rather than personal preferences (Cassar et al., 2026). In Poland, a broad curriculum interpretation enabled connections to current affairs, while the absence of explicit core requirements justified exclusion (Skura et al., 2026). In Turkey, lower-risk curriculum-related issues are addressed more frequently, while highly contentious topics are often excluded or superficially treated (Hanna et al., 2026). Thus, the curriculum's impact depends less on the text itself and more on the interaction of curricular relevance, risk perception, and institutional context.

The curriculum's structural-regulatory framework governs content, hours, outcomes, assessments, and exams, limiting political and controversial topics. It also shapes cultural-ideological priorities by selecting which knowledge and values are taught. School administrations' interpretation and enforcement further influence its institutional and societal effects.

Teachers mediate the curriculum by connecting content to current issues and diverse social experiences, highlighting marginalized perspectives, and critically examining official narratives. However, they may also view curricular boundaries as fixed, excluding certain topics or views. This mediation depends on factors such as curriculum flexibility, legal protections, school leadership, exam pressures, professional training, and teachers' confidence in facilitating discussion. Consequently, the same curriculum can result in avoidance, superficial coverage, a single narrative, or critical dialogue depending on the context.

The absence of a topic in the curriculum does not always signify hegemonic exclusion, nor does its inclusion ensure pluralistic teaching. Factors like instructional time, disciplinary scope, and developmental needs legitimately shape content selection. The curriculum becomes hegemonic when it normalizes selective knowledge boundaries, systematically hides evidence-based alternatives, and perpetuates this bias through institutional practices and teacher decisions.

3.3.4. School and Societal Pressures: Institutional Oversight, Anticipated Reactions, and Support

Teachers' decisions to address political and controversial issues are shaped by legal regulations, curriculum, personal pedagogy, administrators' views, collegial support, student and parent expectations, media, and political contexts. Democratic discussion depends on schools fostering respectful, trusting spaces for diverse views (Hess & McAvoy, 2015). Teachers feel freer pedagogically

when supported by administrators, colleagues, and clear conflict management; in risk-averse settings, avoiding controversy often seems safer (Barton & McCully, 2012; Levy et al., 2023).

Institutional and societal influences shape teachers' behavior through direct interventions or anticipated responses. Warnings from administrators, complaints from parents or students, and criticism from colleagues can restrict discussion (Gindi et al., 2021; Karousiou et al., 2025; Oulton et al., 2004; Swalwell & Schweber, 2016; Zembylas & Kambani, 2012). Even without explicit intervention, teachers uncertain of administrative support or fearing bias accusations may avoid sensitive topics, soften language, or address content superficially (Dunn et al., 2019; Hess, 2004; Zembylas & Kambani, 2012). Teachers learn which issues are risky not only from official statements but also from past incidents, colleagues' experiences, and implicit school culture messages. Thus, anticipated reactions prompt risk assessment and self-censorship without formal sanctions.

Media-driven social polarization extends beyond schools, leading teachers to limit topics, discussion depth, and sources to avoid misinterpretation or politicization on social media. Political campaigns amplified by media influence school climates through parent groups and boards, creating a chilling effect even without legal restrictions (Pollock et al., 2022). The impact varies with polarization levels, institutional support, and the issues addressed.

The primary focus of the school-and-societal-pressure manifestation is the institutional-societal domain. School administrators, colleagues, students, parents, and the media exert external pressure on teachers and influence which political issues are considered educationally acceptable, safe, or objectionable. Labels like "too sensitive," "inappropriate for students," or "likely to cause difficulties for the school" circulate and normalize cultural-ideological legitimization. Formal complaints, investigations, and sanctions further reinforce structural-regulatory mechanisms.

Intellectual-pedagogical mediation describes how teachers interpret expectations and apply them in classroom decisions. Anticipating parental reactions, media scrutiny, or administrative intervention, teachers may assess professional risks that lead to avoidance, softened language, superficial treatment, or self-restraint. Schools and their social environments vary; within the same institution, some view controversial issues as risks, while others see them as vital to democratic education. Thus, the institutional environment can both restrict teachers' actions and legitimize discussion, protect against backlash, and encourage pedagogical risk-taking.

Not all administrative actions or social expectations protecting students' safety, privacy, or freedom from discrimination constitute hegemonic pressure. Unlike legal constraints, hegemonic pressure relies less on formal coercion and more on legitimizing boundaries through everyday interactions in schools and society. An intervention becomes a hegemonic barrier when it delegitimizes a legitimate political issue within asymmetrical power relations, promoting a specific worldview and causing teachers to avoid or limit discussion.

3.3.5. Historical Narratives: Hegemonic Common Sense and Critical Inquiry

Teaching historically and politically charged events with deep emotional significance presents unique challenges. Conflicts, military interventions, human rights violations, forced migrations, and collective traumas are not merely past events; they continue to influence identities, affiliations, and intergroup relations today. It is essential to distinguish the historical event from the narratives that select, connect, and represent it. Since the same event can be interpreted from multiple perspectives—varying in origins, causes, perpetrators, and victims—classroom inquiry must explore not only what happened but also who interprets the past, using which sources and within what context.

Examining contested histories through diverse narratives encourages comparison, multidimensional evaluation, and democratic deliberation (Hess, 2002; Hess & An, 2006; Hess & Gatti, 2010). However, when recent history intersects with family experience, identity, and belonging, it can provoke emotional tension (Barton & McCully, 2012; Gindi et al., 2021; Holden, 2004; Kuş, 2015; Magendzo & Toledo, 2009; McCaffery & Hansson, 2011). In divided classrooms, some students remain silent to avoid exclusion, blame, or being seen as group representatives (Hess & McAvoy, 2015; Reitano et al., 2008). In Northern Ireland, presenting the other group's perspective sparked conflict between multiperspectivity and loyalty to family and community (Pace, 2024). Similarly, in the Greek-Cypriot context, where alternative narratives may be viewed as disloyalty, anticipated student and parent reactions led some teachers to avoid controversial history (Karousiou et al., 2025).

The historical-narratives approach primarily analyzes the cultural-ideological domain. By emphasizing certain events and downplaying others, it frames specific interpretations as national or social realities, embedding these meanings into common sense. When adopted as "official memory" in curricula, these narratives often reflect dominant political ideologies. Politically endorsed narratives, collective memories, and local power dynamics restrict alternative historical perspectives (Chimbunde & Brown, 2026; Hung et al., 2026; Skura et al., 2026). This influence extends beyond textbooks to family stories, commemorations, school culture, media, and political discourse, shaping which historical interpretations are accepted as legitimate.

Historical narratives intersect with various domains. The official curriculum reflects structural-regulatory roles, while legitimacy from school culture, families, and media shows institutional-societal influence. Intellectual-pedagogical mediation involves teachers' evaluation of their historical stance, interpretation of students' emotions, source selection, and promotion of diverse perspectives. In conflict zones, these dynamics can threaten teachers' professional and physical safety. For instance, in southern Thailand, state and separatist groups use narratives of glorification and victimhood to justify political positions, making multiperspectival teaching potentially life-threatening (Hanna et al., 2026). Here, teachers' avoidance may be a self-protection strategy rather than hegemonic consent.

Hegemonic common sense is neither consistent nor fixed. In the same classroom, dominant views often coexist with differing or challenging perspectives. By comparing diverse sources—including marginalized experiences—and analyzing historical claims against evidence, context, and causation, teachers can encourage critical evaluation of established narratives. Good sense involves helping students develop a coherent, evidence-based, and critical understanding of history, rather than merely substituting one official narrative for another.

Recognizing multiple historical narratives does not imply all interpretations are equally valid academically or ethically. Factual accuracy should be assessed through evidence, source criticism, and historical methods. The model's role is to expose power dynamics that render certain interpretations unquestionable. A narrative becomes hegemonic not by popularity or official status, but by systematically restricting alternative evidence and experiences.

3.3.6. Teacher Identity and Professional Subjectivity: Professional Preparation, Self-Positioning, and Risk Judgment

Teachers' decisions to address political and controversial topics depend not only on subject knowledge and pedagogy but also on their professional training, self-efficacy, cultural background, social identities, personal beliefs, and institutional roles. Therefore, teacher identity and professional subjectivity are dynamic processes shaped by educational, institutional, and social contexts, reflected in their pedagogical choices.

Inadequate teacher education in theory, practice, and discussion facilitation is a major issue (Çopur, 2015; Karlberg & Bezzina, 2022; Kuş & Öztürk, 2019; Philpott et al., 2011; Waterson, 2009). This problem includes limited professional learning, lack of practical experience, collegial interaction, authentic classroom exposure, and feedback (Karousiou et al., 2025). Insufficient preparation can cause teachers to avoid accommodating diverse views, addressing discriminatory discourse, and managing emotional tension (Alarcón & Bellow, 2018; Gindi et al., 2021; Hess, 2002; Oulton et al., 2004; Waage et al., 2016). During crises, a lack of confidence in pedagogical tools for engaging political emotions (Ketko-Ayali et al., 2025) or conflict-management skills may disrupt discussions despite student willingness to participate (Kaka et al., 2021; Kindlinger & Hahn-Laudenberg, 2023; Kuş & Öztürk, 2019; Logtenberg et al., 2024). Conversely, high-quality teacher education and professional support improve teachers' self-efficacy and readiness to address these challenges (Erlich & Gindi, 2019; Wong et al., 2019).

Self-efficacy alone does not guarantee a democratic instructional process. Confidence without subject knowledge, ethical judgment, and critical self-reflection risks teachers imposing their views. Teachers' cultural backgrounds, social identities, and worldviews may bias them toward certain narratives or make controversial topics feel threatening (Bekerman, 2009; Fickel, 2000; Gindi et al., 2021; Ho et al., 2017; Hung, 2020; James, 2014; Oulton et al., 2004; van Hover & Yeager, 2003). Research on preservice early-childhood teachers shows that personal values and emotional unpreparedness can lead to avoidance or superficial treatment of issues (Han et al., 2026), underscoring the challenge of neutrality in teaching (Cohen, 2016; Michaeli, 2014; Williams, 1994). In Poland, expectations for teachers to remain apolitical (Skura et al., 2026) and fears of bias (Schulte, 2026) illustrate this struggle. Neutrality does not mean value-neutrality but requires awareness of one's standpoint, avoiding manipulation, and facilitating discussions grounded in evidence, human rights, and universal principles.

Teacher identity and professional subjectivity are analytical constructs that shape how teachers interpret challenges but are not separate domains or the mediation process itself. Intellectual-pedagogical mediation integrates influences from all domains into teaching decisions, with identity and subjectivity visible but distinct from this process.

Treating neutrality as avoiding current issues or excluding political topics from teaching can become ingrained norms. However, neutrality, identity, and risk perception are not fixed traits guiding pedagogy. Cassar et al. (2026) show that teachers' choices to engage in unplanned discussions depend more on their interpretation of the situation and perceived stakes than the topic itself. Teachers may act to prevent harm, set moral boundaries, challenge prejudice, promote democratic-critical development, or fulfill professional duties. Thus, pedagogical decisions reflect a complex interplay of professional knowledge, identity, emotions, institutional roles, and contextual risk assessments, not just personal views.

Subjectivity mediates hegemonic operations when personal or professional roles merge with institutional authority, becoming unquestioned truths that delegitimize evidence-based alternatives and limit student participation. A lack of pedagogical knowledge or self-efficacy contributes to this barrier only when combined with uncritical acceptance of dominant narratives and restricted student engagement.

Teacher education should encompass critical self-evaluation, discussion facilitation, ethical decision-making, and democratic use of institutional authority, alongside subject knowledge and self-efficacy. However, overcoming hegemonic barriers cannot rely solely on individual effort.

Sustaining critical pedagogical mediation demands legal protections, institutional support, curricular flexibility, and professional autonomy in addition to personal capacity.

3.3.7. Assumptions about Students' Political Agency: Age, Childhood, and Participation

Students' age influences teachers' decisions to introduce political topics in class (Houser, 1996; Kelly & Brooks, 2009; Parker, 2006). At the primary level, these issues are often excluded, assuming students lack the cognitive and linguistic skills to engage with complex matters. In the U.S., some teachers considered students "too young" to form political opinions (Dunn et al., 2019), while Canadian preservice teachers believed young children were uninterested in current affairs and unable to analyze politics (Kelly & Brooks, 2009). In Poland, perceptions of students' immaturity led to political topics being briefly mentioned or omitted (Skura et al., 2026). While such concerns may reflect developmental responsibility, it is important to distinguish developmental differences from assuming children cannot understand political issues.

Research shows that with appropriate teaching methods, young students can grasp concepts like racism, discrimination, justice, equality, and human rights (Levstik & Barton, 2011; Shuttleworth & Lomax, 2018). Although they may not use adult political language, children develop political meanings through everyday experiences of fairness, rules, exclusion, representation, rights, and collective decision-making. Restricting politics to parties, elections, and government overlooks children's experiences of power, justice, participation, and coexistence. Assessing their political understanding solely by adult standards risks missing their unique perspectives.

Teachers' concerns about age stem not only from students' cognitive development but also from social views of childhood as a protected, dependent phase outside public life (Engelbert, 1994; Makrinioti, 1994; Qvortrup, 1994). Preservice teachers aiming to preserve childhood innocence often avoid topics they consider severe or frightening. Likewise, narrow, protectionist views of developmental appropriateness can exclude real social issues from the classroom (Han et al., 2026; Kelly & Brooks, 2009). This perspective sees children less as active interpreters of social life and more as future citizens to be prepared for public participation.

This analysis focuses on the cultural-ideological domain. Common beliefs such as "children do not understand politics" or "political issues are inappropriate for children" create invisible boundaries that exclude childhood from political life, determining which age groups may discuss certain topics without explicit prohibition. These beliefs intersect with other domains: limited political content in curricula for younger students reinforces structural-regulatory mechanisms, while parental expectations and school administrators' avoidance of controversy uphold institutional-societal dynamics. Teachers' perceptions of childhood, professional training, and self-efficacy further influence how these factors shape pedagogical decisions.

Recognizing students' political agency does not mean they possess the same knowledge, experience, or decision-making power as adults. It refers to their capacity to interpret relationships affecting their lives, form views on rights and justice, engage with diverse perspectives, and express concerns. However, student voice alone does not ensure critical consciousness, as classroom power dynamics, source selection, and teacher guidance can reinforce biases (Gilbert, 2018; Kelly & Brooks, 2009; Kuş & Öztürk, 2019; MacCoy, 2018). Thus, structured learning environments are crucial for students to test their views against evidence, encounter differing perspectives, and reassess assumptions.

Not all pedagogical concerns about age and development create hegemonic barriers. Students should be shielded from traumatic content, discriminatory speech, and political indoctrination, with

language and topics tailored to their developmental stage. The key distinction is between using age to guide support and using it to exclude children from political engagement. Age becomes a hegemonic barrier when it treats children as a uniform, apolitical group and restricts their participation. Early political literacy involves discussing justice, rights, responsibility, and participation in safe, age-appropriate settings—not merely transmitting adult content.

4. Discussion

The Hegemonic Barrier Model explains how influences from structural-regulatory, institutional-societal, and cultural-ideological domains persist through coercive and consensual mechanisms and are reflected in classroom decisions via intellectual-pedagogical mediation. The model's six analytical manifestations are not fixed or mutually exclusive barriers but serve as entry points to examine how instructional challenges become hegemonic. Its theoretical contribution lies in explaining the conditions that cause teaching difficulties in political and controversial issues to become hegemonic, leading to pedagogical narrowing.

By integrating coercion and consent with the integral state, the model offers a framework to examine sanctions, institutional expectations, legitimacy, and normalization as interconnected elements of hegemonic operation. The concepts of common sense, good sense, and intellectual-pedagogical mediation enable consideration of reproduction, negotiation, resistance, and transformation. Teachers are positioned neither as passive recipients of structural pressures nor as fully autonomous actors; rather, they interpret these influences through professional judgment, making pedagogical decisions that may reproduce, negotiate, resist, or transform existing legitimacy boundaries.

The model differentiates protective pedagogical boundaries from hegemonic narrowing. Avoidance, silence, or restriction should not be seen as hegemonic reproduction without considering the context. These practices may stem from legitimate concerns about student protection, professional responsibility, or institutional risks. Thus, analysis should focus not on avoidance or restriction alone, but on the power relations behind them, the legitimacy they uphold, and their impact on knowledge, discussion, and classroom participation.

The model was developed by synthesizing research from various national and educational contexts, but its components have not been empirically tested together. Therefore, no universal conclusions can be drawn about the prevalence, direction, or causality of the proposed relationships. Contextual and methodological differences among the studies also limit direct generalization. Thus, the model should be viewed not as a fixed causal framework but as a flexible tool for analyzing hegemonic relations in education.

4.1. Implications for Research and Practice

Democratic classroom discussion cannot rely solely on teachers' willingness to take professional risks. At policy and institutional levels, legal boundaries on teaching political and controversial issues must be clear, predictable, and proportionate. Curricula should allow sufficient time and flexibility for pluralistic, evidence-based discussions, while school administrations must provide institutional protection and transparent complaint procedures. Teacher education and ongoing professional development should support subject knowledge, discussion facilitation, ethical decision-making, critical self-assessment, evidence evaluation, and managing emotional and intergroup tensions. Developmental considerations should guide appropriate pedagogical support, not justify excluding students from political topics. These efforts require legal safeguards, curricular flexibility, institutional backing, and professional autonomy.

The empirical application of the model begins by identifying the restricted topic, knowledge, viewpoint, narrative, or subjectivity. Researchers then analyze relevant power relations, operational domains, processes of selective legitimation, sustaining mechanisms, teachers' interpretations, and resulting pedagogical outcomes. Since the model is relational, a single finding may relate to multiple hegemonic domains. Combining interviews with classroom observations, policy and curriculum documents, instructional materials, reflective records, and quantitative data allows comparison of reported accounts with observed practices and examination of recurring patterns. Cases that do not meet hegemonic barrier criteria, as well as contrasting cases with similar conditions but different outcomes, should also be included. Such comparative analyses help test the model's explanatory scope and analytical boundaries across diverse educational and national contexts.

5. Conclusion

The key finding is that not all difficulties in teaching political and controversial issues are hegemonic barriers. A difficulty becomes hegemonic when it legitimizes certain knowledge, narratives, or subjectivities within unequal power relations while delegitimizing evidence-based alternatives. This legitimacy boundary is maintained through coercive and consensual means, such as sanctions, institutional and societal expectations, normalization, and risk anticipation. Teachers interpret these mechanisms through professional judgment, leading to pedagogical choices that limit pluralistic discussion. Thus, the critical factor is not the difficulty's source but what it legitimizes and how it impacts knowledge, discussion, and participation opportunities in the classroom.

6. Declarations

6.1. Conflict of interest

The author declares no conflict of interest.

6.2. Funding

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6.3. Author contributions (CRediT)

Yusuf Erhan Bencamin Onganer: Conceptualization; Methodology; Formal analysis; Writing—original draft; Writing—review & editing

6.4. Data availability statement

Data sharing is not applicable to this article as no datasets were generated or analyzed during the current study.

6.5. Ethics approval

Because the study is a theory-directed conceptual synthesis based exclusively on published sources and does not involve human participants, personal data, or primary data collection, ethics committee approval was not required.

6.6. Use of artificial intelligence (AI) tools

Wordvice AI and ChatGPT (OpenAI) were used for language editing, grammar checking, and stylistic refinement of the manuscript. The author reviewed and edited the content and takes full responsibility for the publication.

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Development and validation of the Autonomy Support Situational Judgment Test for Preschool Teachers

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ABSTRACT

Autonomy support is crucial to the development of children's autonomy and intrinsic motivation. Existing evaluation methods face threefold contradictions: convenience versus authenticity, objectivity versus generalizability, and depth of interpretation versus dynamic correlation. To address this, this study developed a set of situational judgment tests for preschool teacher autonomy support. First, we established three dimensions: high control (HC), slight control (SC), and high autonomy (HA). Second, we collected real teaching situations through event sampling observation and selected seven typical situational events using the Delphi method, and 21 behavioral response items were designed. After testing 300 preschool teachers, the results showed that the reliability estimate of the weighted composite score calculated by Mosier's formula was 0.87. Confirmatory factor analysis showed that the model fitted well, and the content validity was verified by expert review and theoretical framework. These findings provide preliminary evidence for the reliability and validity of the tool for assessing preschool teachers' autonomy support. Its utility for teacher training and self-diagnosis requires further intervention and longitudinal research.

KEYWORDS: Preschool teachers; Autonomy support; Situational judgment test; Test development

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1. Introduction

Against the backdrop of global educational reforms shifting from traditional standardized instruction to a personalized learning paradigm, the international education community has increasingly emphasized the critical role of teacher autonomy support (TAS) in cultivating students' core competencies and lifelong learning capabilities. This shift reflects the amalgamation of constructivist learning theories and humanistic educational philosophies, advocating that teachers create autonomy-supportive learning environments to stimulate students' intrinsic motivation and critical thinking, and thus promote the return of educational practices to their essential learner-centered orientation. Autonomy support can help teachers overcome the constraints of traditional authoritative teaching, stimulate their teaching innovation vitality, and enhance their professional wellbeing. At the same time, the improvement of teacher autonomy support level also helps to build a more active teacher-student relationship and promote students' autonomous learning and holistic development. This has far-reaching implications for promoting the optimization of the educational ecology and achieving sustainable development of education. Autonomy support is an important

concept in self-determination theory. It refers to the support that meets the autonomy of individuals, allowing individuals to act in a way that conforms to their own values, goals and interests, thereby enhancing their intrinsic motivation and self-regulation ability (Deci & Ryan, 2002). Autonomy support strategies can meet students' individual learning needs and promote their learning engagement (Wang, 2026). The early childhood stage is a critical period for the growth and development of individuals, during which the autonomy support of preschool teachers is particularly important. Autonomy support of preschool teachers can be understood as interactive strategies that support the development of children's intrinsic motivation and autonomy. It is manifested in behaviors such as providing opportunities for choice, using noncontrolling language, acknowledging children's emotional needs, and encouraging self-decision making. The OECD's Starting Strong V: Transitions from Early Childhood Education and Care to Primary Education makes a compelling case for preschool teachers to create interaction environments that allow children full autonomy to express and explore (Organisation for Economic Co-operation and Development [OECD], 2017). This is highly consistent with the concept of autonomy support, highlighting the important position of autonomy support by preschool teachers in early childhood education. Such supportive educational practices can not only promote the development of autonomy and intrinsic motivation in young children, but also provide them with a favorable educational environment for their overall development. Therefore, preschool teachers should actively adopt autonomy support strategies when implementing educational activities in order to promote the healthy growth and all-round development of children.

In educational practice, researchers adopt a variety of ways to evaluate teacher autonomy support behavior. Questionnaire survey is simple to operate and suitable for large-scale collection and statistical analysis, but it is prone to the influence of subjects' subjective biases and social expectation effect (Cui & Bao, 2025). Classroom observation method provides authentic data to improve teaching by directly recording the details of teaching interactions, but it has limitations such as high cost, long duration, and interference with the behavior of teachers and students (Villegas et al., 2025). Event sampling observation has the advantages of authenticity, systematicness and strong pertinence, but it is limited by the subjective judgment of the observer and the lack coverage (Zachariou & Bonneville-Roussy, 2024). In order to make up for the shortcomings of a single method, a mixed method such as explanatory sequential design has emerged. It combines quantitative and qualitative evaluation to ensure the reliability and validity of the data, and also allows for an in-depth exploration of the complex mechanisms of influence. However, the two types of data are prone to disconnection during the integration process, making it difficult to systematically present the dynamic mechanisms of teacher autonomy support behaviors in real scenarios. (Wang et al., 2024). From this perspective, the current evaluation system reveals three types of contradictions: the contradiction between convenience and authenticity, the contradiction between objectivity and generalizability, and the contradiction between the depth of explanation and dynamic correlation. Therefore, it is imperative to develop an evaluation tool that can fully and accurately reflect teacher autonomy support behaviors, so as to break through the triple contradiction of the current evaluation system.

Situational judgment test (SJT) provides a new idea to solve the above three-fold contradiction. SJT is an effective tool to assess individuals' judgment and decision-making ability in specific situations, through presenting problems in concrete situations and asking the testees to choose the best solution (Firouzabadi & Keshmiri, 2025). In the evaluation of kindergarten teacher autonomy support behaviors, situations can be designed that are close to real teaching scenarios. For example, when children encounter difficulties during autonomous play or do not follow the rules during collective

activities, allow teachers to choose the most appropriate way to deal with them. This method can simulate real scenarios, reduce subjective biases and expectation effect, and improve the authenticity of data, breaking through the contradiction between convenience and authenticity. It can be implemented on a large scale, reducing costs and time investment, and improve the objectivity of evaluation through standardized situations, breaking through the contradiction between objectivity and generalizability. Through the analysis of teachers' responses in different situations, it can explore the performance and motivation of autonomy support behaviors, show the changes of behaviors in dynamic situations, and break through the contradiction between explanatory depth and dynamic correlation.

At present, situational judgment tests have gradually been applied to the field of preschool education. Nilsen et al. (2020) used situational judgment questions (SJQs) as a core tool to assess the quality of the process of preschool education in the field trial of the OECD's 2018 "Teaching and Learning International Survey of Strong Starts", covering three dimensions: encouraging prosocial behavior, behavior management, and supporting child-led play. Li et al. (2022) developed a situational judgment test of analysis and response skills for preschool teachers (SJTs-PTSAR), which includes 16 scientific education-related situations to examine the skills of teachers in analyzing and responding to the developmental trajectory of children's pre-concepts. Alsaeed and Mohammad (2023) used a situational judgment test with 15 authentic mathematics teaching situations as a core assessment tool to carry out a 15-week situational professional development program, which effectively enhanced the student-centered teaching practice ability of preschool normal students. Thohiroh et al. (2025) developed a Mindful Parenting in Preschoolers Situational Judgment Test (MPP), which retained 30 items and three dimensions of awareness, sympathy, and non-reactivity after testing, and was suitable for parents of preschool children aged 3–5, and was significantly negatively correlated with parenting stress. Murano (2019) developed a comprehensive assessment tool including a situational judgment test based on the Big Five personality theory framework in her doctoral thesis, which provided new ideas for the assessment of social and emotional skills in preschool children. This indicates that the situational judgment test plays an increasingly important role in the field of preschool education, but the situational judgment test for the autonomy support of preschool teachers has not yet been developed.

Therefore, based on the existing mature scale of autonomy support, this study follows the scientific development requirements of situational judgment tests, and compiles a set of situational judgment tests that can be used for scientific evaluation of the autonomy support level for preschool teachers.

2. The Process of Test Construction

2.1. Determine the Measurement Structure

To identify the measurement structure, it is first necessary to clarify the structural dimensions of autonomy support. Deci et al. (1981) proposed the important concept of autonomy support and developed The Problems in Schools Questionnaire (PIS) to examine teacher autonomy support. The questionnaire uses eight teaching situations suitable for primary and secondary schools, lists four categories of incentive behaviors that might occur in each situation, namely high autonomy, moderate autonomy, moderate control, and high control, and the teachers rate their tendency to adopt each teaching behavior (Halvari et al., 2022). Reeve et al. (1999) found among the four types of teacher incentive behaviors proposed by Deci, the score of moderate autonomy was positively correlated with moderate control and high control, and moderate autonomy tended to be more controlling. Therefore, they adopted the method of deleting the response items related to moderate

autonomy to modify the questionnaire, and conducted validity testing on the modified PIS questionnaire, and showed that it had a high validity. Later, Chinese scholar Wang (2018) found that among the four types of teacher incentive behaviors proposed by Deci, distinction between moderate autonomy and moderate control was small. Theoretically, the key difference between autonomy support and control in Self-Determination Theory lies not in the degree of teacher involvement, but in whether children's autonomy needs are met and whether they are regarded as decision-making agents. Although moderate autonomy and moderate control differ in control intensity, both essentially center on teacher-preset goals, instructional frameworks, and problem-solving paths; teachers merely guide children in a gentler, indirect, or heuristic manner, without truly returning the right to choose and solve problems to the children. In contrast, high autonomy emphasizes respecting children's autonomy in both emotion and behavior, providing opportunities for choice, and encouraging children to think from multiple perspectives and attempt to solve problems themselves. Therefore, merging moderate autonomy and moderate control into "slight control" is not a simple reduction of dimensions, but a restructuring of the control-autonomy continuum based on conceptual homogeneity and empirical discriminability: high control represents strong control, mild control represents weak control but still belongs to the control orientation, and high autonomy represents true autonomy support. Compared to the original four-category model, the three-dimensional model (HC-SC-HA) is more appropriate: first, its conceptual boundaries are clearer, avoiding semantic overlap between "moderate autonomy" and "moderate control" or "high autonomy"; second, it has better empirical discriminability, reducing the misjudgment of gentle control as autonomy support in teacher self-reports due to social desirability; third, it better fits the measurement requirements of situational judgment tests, with three response items—high control, slight control, and high autonomy—set for each situation, facilitating clear behavioral orientation judgments and weighted scoring. Therefore, this study took the questionnaire compiled by Deci as the basis, referred to the modification method of Reeve et al., combined the two items of moderate control and moderate autonomy into slight control, and determined that high control, slight control and high autonomy were measurement structure (see Table 1 for details), and the situational judgment test that can be used to evaluate the control or autonomy orientation adopted by preschool teachers in interaction with children was compiled.

Table 1 Measurement structure of the autonomy support questionnaire for preschool teachers

Structure	Connotation
High control (HC)	Teachers take charge or solve problems in a punitive/rewarding way. <i>E.g.</i> , giving the answers to the questions directly or demanding requirements in commanding way.
Slight control (SC)	Compared with high control, the lower degree of control can provide necessary help for young children, but essentially still solve problems according to the teachers' way of thinking. <i>E.g.</i> , inspire children through communication, encourage children to use references to create.
High autonomy (HA)	Teachers respect the autonomy of young children in emotion and behavior, encourage them to consider multiple aspects of problems, give them opportunities to choose, and try to find solutions by themselves. <i>E.g.</i> , listen to the ideas of young children and encourage them to try boldly.

2.2. Collection and Screening of Situational Events

2.2.1. Collection of Situational Events

Situational events provide the testees with the background and basis for assessment in the situational judgment test, stimulate their cognition and response, and serve as the standard for evaluation and comparison. In the situational judgment test of autonomy support for preschool teachers, using segments of kindergarten life that teachers are familiar with as measurement questions is more likely to elicit the true reactions of the subjects and measure the true results. To this end, the researchers went deep into the kindergarten and collected situational events using the event sampling observation method. First, the observation situations were determined. Based on the study of preschool education books, journals and kindergarten cases, seven situations in which teacher autonomy support often occurs were sorted out: indoor centralized teaching activities, outdoor centralized teaching activities, game activities, learning activities, post-activity sorting, meals (snacks and full meals), and other activities. Subsequently, a month-long follow-up observation was carried out in the small, middle and large classes of C kindergarten in S city. Two hours each morning and afternoon were selected for observation, and the situations in which teachers interacted with young children were recorded, including the causes, processes, results, and the reactions of teachers and young children in this event. Finally, the collected situational events were collated, the situational events that did not conform to the content of teacher autonomy support for young children or were meaningless were deleted, and the typical ones that could better reflect the autonomy support were selected for linguistic processing and integration, and finally a total of 24 situational events were collected.

2.2.2. Screening of Situational Events

Typicality and commonality are the criteria for screening situational events in the situational judgment test, which also affect the validity and reliability of the test (Chen & Burns, 2025). Therefore, this study selected five graduate students in preschool education with more than half a year of internship experience and 15 preschool teachers with more than three years of teaching experience to form an evaluation group, asking them to evaluate the typicality and commonality of the situational events collected, which were divided into two links. The first link was to judge the typicality of the situational events, and the evaluation group discussed whether the situational events collected were representative, deleting the situational events that the evaluation group couldn't reach a consensus and the low representative ones. The second link was a 7-point scoring evaluation (1= "least common" and 7= "most common") on whether the situational events had commonality by the group members. The larger the number, the more common the situational events are. After the evaluation by the evaluation group, evaluation results were statistically analyzed, and the situational events with a total score below the average and a high standard deviation in the same situation were eliminated.

Finally, after two rounds of screening, nine scenarios with good typicality and commonality were obtained (The standard deviation range is 1.099–1.525), and the scenario language description was modified and integrated to the official problem scenario stem content. The scenario problem content (excerpt) is shown below (Table 2).

Table 2 Summary of situational events (excerpt)

Classification	Problem Situation
Teaching activity	In an art activity, the teacher asked children to draw a slide they had seen with their favorite colors. Everyone began to focus on drawing. The teacher noticed that Du Du was sitting still and had not started. The teacher asked, and Du Du said, “Teacher, I don’t know how to draw a slide.”
Game activity	Longlong was carefully building his sky garden in the construction area and had almost finished. Xiao Yu rushed over and accidentally knocked it down. Longlong became very angry.
Learning activity	The teacher bought a crab from the market. Zibo loved it and went to see it first thing every day. Today Zibo found that the crab had shed its shell and asked many questions about it, refusing to leave even after class started.
Life activity	Mingming, a child in the junior class, disliked vegetables and ate very little. At lunch, there were broccoli and spinach. As soon as Mingming sat down, he pushed the vegetables to the edge of the plate with his spoon and frowned, saying, “I don’t want to eat this!”

2.3. Collection and Screening of Behavioral Response Items

2.3.1. Collection of Behavioral Response Items

Behavioral response items are multiple selectable behavioral response options listed for each specific work or life situation description in the situational judgment test, representing the different actions or coping methods that individuals might take in that situation. To obtain discriminative and authentic behavioral responses in nine situational events, a semi-structured interview method was used to collect behavioral response items. The identified nine situational events were designed into the interview content, and 15 preschool teachers were interviewed, asking the teachers to answer the practices they might take in these situations, rather than what they thought was the best practice. After the interview, the possible coping measures of preschool teachers in this situation were recorded, and then the interview data organized into response options according to the three types of behaviors: “high control”, “slight control”, and “high autonomy”. After preliminary organization, five behavioral response items were obtained for each situational event, totaling 45 behavioral response items for nine situational events.

2.3.2. Arrangement and Screening of Behavioral Response Items

2.3.2.1. Arrangement of Reaction Options

The researchers combined the behavioral responses collected, removed the behaviors that had nothing to do with the situation, and then classified the items of the behavioral responses that had preliminarily collated according to the three dimensions of “high control”, “slight control”, and “high autonomy”. For example, when asked “what would you do if a child can’t draw a slide in an art activity”, five teachers gave their responses based on their usual practice (Table 3).

Table 3 Examples of teacher responses

Teacher	Response
T1	I would not reproach him for not doing as others do, but I would first ask him where he is at fault, and then encourage him: What do you like to draw? Go ahead and try.
T2	Before drawing the slide, I will show the children a lot of pictures of slides, then let the children talk about what parts the slide is made of, then let them draw. When drawing, one or two demonstration pictures will be put up. If there are still children who don't know how to draw, I will let them watch the slide in the demonstration drawing, let them talk about what the slide looks like, and then let them draw.
T3	I will guide him: Look, what does the slide in our kindergarten look like? Some are like rectangles, some are like circles, they are built together, with many beautiful colors, so let's draw a rectangular slide first! I can hold his hand and lead him to draw.
T4	I will use language cues, such as: What does the slide in our kindergarten look like? What color is it? Try to draw it.
T5	I would ask him: why can other children do it and you can't? Do you still want to draw a slide? If you still want to draw, then draw according to the slide in the yard.

It can be seen from the table that when T1 found that children could not draw a slide, she did not blame them, but guided them to express their needs in a questioning way and encouraged them to try boldly. Emotionally and behaviorally, she understood and respected children's autonomy and should be attributed to the high autonomy dimension. When T5 found that children could not draw a slide, she not only blamed them but also required them to draw according to the slide in the kindergarten in a warning tone. In the process of solving the problem, the teacher always occupied the dominant position, neglected the children's will, and her blame, warning and demands put pressure on the children. Finally, she forced the children to complete the painting according to the way she stipulated, so she was attributed to the high control dimension. T2, T3 and T4 inspired the children by talking about the appearance of the slide. Although they gave the children a chance to discuss and provided necessary help for the children, they did not explore the reasons why the children could not draw the slide. Essentially, they still used the teacher's thinking to solve the problem. Especially the behavior of T2 and T3 had obvious control. They can be attributed to the slight control dimension.

2.3.2.2. Screening of Reaction Options

The Delphi method was used to further screen the items of response, and an expert group was formed by inviting three preschool education experts and two preschool teachers, each with more than three years of teaching experience, for evaluation. First, the members of the expert group were trained to know the meaning and characteristics of high control, slight control and high autonomy, in order to the way for the subsequent evaluation. Then, the experts were divided into two groups, and the two groups of experts evaluated whether the items of response could reflect the autonomy support and control of preschool teachers and whether they could effectively distinguish between high control, slight control and high autonomy. After the first round of evaluation, the options agreed upon by the two groups of experts are retained, and the options deemed by the experts to lack discriminative power are excluded. Options with conflicting opinions proceed to the second round of discussion, where the expert panel will decide whether to delete or modify them after further deliberation. Finally, combined with the results of the expert evaluation, three behavioral response items were formed in each problem situation. For example, in the situation where children do not know how to draw a slide, the response items are: let children refer to the example picture to draw, and tell children that they

can be rewarded with a small sticker for drawing a slide (high control); talk to children about what shape the slide in the kindergarten is, let children try to draw what they think (slight control); ask children why they can't draw, and encourage children to create boldly (high autonomy). By this stage, the situational judgment test with nine situational events, three response options for each event, and a total of 27 behavioral response items was obtained.

2.4. Content Review and Scoring Method

2.4.1. Review of Test Content

After the above steps, the first draft of the questionnaire on autonomy support for preschool teachers was determined. After the first draft was formed, three preschool education experts and two excellent preschool teachers were invited to give suggestions on whether the test itself was in line with the theoretical conception, the correlation between situational events and autonomy support for preschool teachers, and the discrimination between items of high control, slight control and high autonomy. At the same time, in order to test whether the text expression of the questionnaire was reasonable, five graduate students majoring in preschool education were invited to judge whether there was ambiguity in the text expression of the measurement and to give suggestions. Finally, the test content was perfected according to their opinions.

2.4.2. Determination of Scoring Method

The scoring of test items is an important step in quantifying the test-takers' responses, focusing on the design of appropriate scales and scoring methods to measure the test-takers' responses to the items (Downing, 2006). The questionnaire requires teachers to read each question situation carefully, then consider three possible answers' alignment with their own practices in their daily work, and use a 7-point Likert scale to score each item to indicate the extent to which they believe the answer aligns with their actual practice, with 1 indicating "not consistent", 4 indicating "possibly consistent", and 7 indicating "very consistent". The scale consists of 27 items, of which nine items are highly controlling, belonging to the high control scale (HC); nine items are lightly controlling, belonging to the slight control scale (SC); and nine items are highly autonomous, belonging to the high autonomy scale (HA). The research refers to the results of Deci et al., and the questionnaire scores are weighted to ensure that the questionnaire results can effectively reflect the level of autonomy support of preschool teachers. First, the scores of the nine items in each subscale are averaged to obtain the score of each subscale, ranging from 1–7 points. Then, the scores of the high control scale (HC), the slight control scale (SC), and the high autonomy scale (HA) are weighted as -2, -1, and 2, respectively, and then summed to obtain the total scale score. The total scale score is: $2HA - SC - 2HC$, the higher the score, the more inclined the preschool teachers are to autonomy support (Deci et al., 1981). The rationale for this weighting formula is as follows: First, high autonomy and high control represent the two ends of a continuum, and are therefore assigned weights of 2 and -2 respectively to reflect their opposing contributions to autonomy support. Second, moderate autonomy and moderate control lack sufficient differentiation, and moderate autonomy is closer to a control orientation; therefore, this study merges the two into slight control and assigns it a weight of -1, representing "weak control" rather than autonomy support. Third, using a weighted sum instead of a simple summation preserves the theoretically different directions and intensities of the three dimensions, avoiding treating controlling behaviors and autonomy-supportive behaviors as equivalent.

3. Test Administration

3.1. Pretest Administration

3.1.1. Subject Selection

The pre-questionnaire was randomly distributed to preschool teachers within the scope of Liaoning Province, and 118 questionnaires were collected. After excluding invalid and incomplete information, a total of 114 valid questionnaires were obtained, with an effective rate of 96.6%.

3.1.2. Project Analysis

The project analysis was conducted using the decisive extreme value method, where the top 27% and bottom 27% of the total scores were set as the high and low groups. Then, the independent sample t-test was applied to compare the differences between the high and low groups in each item. In the project analysis, items with a *CR* value ≥ 3 and a significance level of .01 were considered to be items with discriminatory power. The test results showed significant differences existed between the high and low groups in all items, but one item had a *CR* value of -2.63, with an absolute value less than 3, and it was not discriminative, so it was deleted. Calculate the point-biserial correlation between each item and the total scale score after deducting that item; any item with a correlation coefficient that is significant or is below 0.4 is considered a lowly correlated item. Under this criterion, no new items were deleted. In this test, the highly controlled and lightly controlled items are assigned negative weights during scoring ($HC=-2$, $SC=-1$) and are considered control items. During item analysis, control items are negatively or weakly correlated with the total score, which is the theoretically expected result. Therefore, in the item-total correlation analysis, control items are not simply deleted due to their negative correlation with the total score, but are comprehensively evaluated in conjunction with context-based discrimination tests. The questionnaire was a situational judgment test, with each question situation containing three behavioral response items, representing high control, slight control, and high autonomy, respectively. If the correlation between the control tendency and autonomy tendency items in a situation reached a significant level, it indicated that the situation and behavioral response items cannot distinguish the test-takers' control or autonomy support tendency. Therefore, two situations that did not meet the theoretical assumptions were deleted, and seven problem situations with discriminatory power were retained. The formal questionnaire included seven problem situations and 21 behavioral response items, covering the three dimensions of high control, slight control and high autonomy.

Wu (2010) proposed that the project compiled based on the theoretical basis can omit the exploratory factor analysis. In this study, the questionnaire of situational judgment test clearly defined the measurement structure dimensions in advance, and the questions were constructed around specific situational tasks and evaluation dimensions. The response options and items of the questionnaire were reviewed by the Delphi method, and the corresponding relationship between the questions of the questionnaire and the content to be measured was clear, so the exploratory factor analysis was omitted.

3.2. Formal Administration

3.2.1. Subject Selection

According to the principle of convenient sampling, preschool teachers in Shenyang, Fuxin, Chaoyang, Dalian in Liaoning Province and Xi'an in Shaanxi Province and Beijing were selected as the research objects. A total of 308 questionnaires were distributed, and 303 were actually collected. After excluding invalid questionnaires, 300 valid questionnaires were obtained, with an effective recovery rate of 97.4%. Regarding the determination of the sample size, this study referred to the general

requirements for scale development and confirmatory factor analysis. First, the situational judgment test contains 21 behavioral response items, and based on a 1:10 ratio of items to sample size, the required sample size is approximately 210. Second, confirmatory factor analysis usually requires a sample size of over 200. A sample of 300 can meet the stability requirements for model estimation. In terms of gender, there are 7 male teachers (2.3%) and 293 female teachers (97.7%). In terms of age, there are 8 teachers aged 20 and below (2.7%), 192 teachers aged 21–30 (64.0%), 75 teachers aged 31–40 (25.0%), 22 teachers aged 41–50 (7.3%), and 3 teachers aged 51 and above (1.0%), with the sample mainly consisting of young and middle-aged teachers. In terms of teaching experience, there are 39 teachers with less than 1 year (13.0%), 149 teachers with 1–5 years (49.7%), 65 teachers with 6–10 years (21.7%), 27 teachers with 11–15 years (9.0%), and 20 teachers with over 16 years (6.7%), covering both novice and experienced teachers.

3.2.2. Reliability Analysis

The internal consistency reliability of each dimension of the autonomy support situational judgment tests for preschool teachers and the total questionnaire was examined by using Cronbach's α coefficient. The results showed that the α coefficients of each dimension of the questionnaire ranged from 0.74 to 0.89. The formal scoring adopts the weighted composite score of 2HA–SC–2HC, whose reliability is estimated based on Mosier's (1943) weighted composite reliability formula, combined with the reliability of the three subscales and the inter-factor correlations obtained from confirmatory factor analysis, resulting in 0.87. This indicates that the weighted composite score, which matches the actual scoring procedure, has good reliability and can stably reflect the level of autonomy support among preschool teachers. The specific results are shown in Table 4.

Table 4 Reliability estimates of the formal questionnaire

	HC	SC	HA	Total Test
Reliability estimate	0.89	0.74	0.80	0.87

Note. Cronbach's α was calculated for each subdimension (HC, SC, HA). The reliability of the weighted composite score (Total Test) was estimated using Mosier's formula.

3.2.3. Construct Validity

Confirmatory factor analysis was conducted using AMOS 23.0 software to detect whether the questionnaire structure conformed to the theoretical conception. Considering that each question in this test contains three behavioral response items representing high control, slight control, and high autonomy respectively, the three items within the same situation may share situational context, thereby generating situation-related shared variance. Therefore, the study allows for partial residual correlation within the same context to control the impact of context-shared variance on model fitting. With high control, slight control, and high autonomy as latent variables, each latent variable included seven observed variables respectively, which was used as the basis for testing the model of autonomy support for preschool teachers, and the results are shown in Table 5. When the model fit is judged by using confirmatory factor analysis, it mainly refers to the values of χ^2/df , RMSEA, GFI, CFI, and so on. The closer the value of χ^2/df is to 1, the higher model fit to the data, and the value of χ^2/df is less than 2, indicating that the model fit is excellent, between 2–5 is acceptable; the value of RMSEA below 0.05 indicates that the model fit is excellent; the GFI, CFI, IFI change range is between 0–1, and the closer the values of these three are to 1, the better the model is fitted. It can be seen from Table 5 that all the indexes of the model meet the statistical requirements. In which, $\chi^2/df < 2.00$, RMSEA < 0.05, value of GFI is close to 0.85, and the values of CFI and IFI are greater than 0.90. This shows that the questionnaire is reasonable and the model fit is good.

Table 5 Main model fit indices in the confirmatory factor analysis of the formal questionnaire

Indicator	df	χ^2	χ^2/df	RMSEA	GFI	CFI	IFI
Numeric	184	261.72	1.42	0.04	0.83	0.91	0.91

3.2.4. Content Validity

This study ensures the questionnaire has good content validity through a systematic development process. First, the collection of situational events is based on real kindergarten observations, covering typical interaction scenarios in daily teaching, and is ensured to be highly relevant to kindergarten teacher autonomy support behaviors by a panel of judges' selecting for typicality and commonality. Behavioral response items were collected by semi-structured interviews to obtain real teacher feedback, and the options were discriminated by an expert panel using the Delphi to ensure that the response items could effectively distinguish between the three types of behaviors: high control, slight control, and high autonomy. In addition, the draft of the test was reviewed by preschool education experts, front-line teachers, and graduate teams from multiple dimensions such as theoretical fit, situational relevance, option discrimination, and clarity of expression, and it was repeatedly revised based on the feedback. The final form of the situational judgment test not only fits the actual teaching situation but also accurately reflects the theoretical framework of autonomy support, fully guaranteeing the representativeness and adequacy of the test content.

It is particularly worth noting that this test adopts a teacher self-report method, measuring teachers' self-reported behavioral tendencies rather than the autonomy-supportive behaviors actually observed in the classroom. Discrepancies may exist between self-reported behavioral tendencies and actual classroom behaviors. Future research should combine multiple methods such as classroom observations, student perceptions, or external expert ratings to further examine the criterion-related validity and ecological validity of the test.

4. Discussion

4.1. Structure of the Test

Autonomy support situational judgment test for preschool teachers is composed of seven short situational events that describe typical problems that may occur in a kindergarten. Three possible responses to each problem situation, representing the three tendencies of high control, slight control, and high autonomy, follow the problem situation, respectively. The order of the three responses in each problem situation is balanced, with no precedence given to any one.

A large amount of research on the structure of teacher autonomy support has been conducted by scholars, providing theoretical basis for the dimensional division of test. In previous studies, there are two paths to the dimensional division of autonomy support behaviors: one is overall evaluation based on a single dimension, which regards teacher autonomy support as a continuous variable and evaluates its intensity through a Likert scale (Monacis et al., 2023); the other is to construct a multi-dimensional structure from the perspective of support content (Zhao et al., 2025). However, both of these two classification methods have limitations in the development of situational judgment tests. Compared with them, the three-dimensional model of high control, slight control, and high autonomy adopted in this study is more practical. The initial structure of the test is based on "The Problems in Schools Questionnaire" (PIS) by Deci et al., which divides teacher autonomy support into four categories: high control, moderate control, moderate autonomy, and high autonomy. However, subsequent studies have found that there is conceptual confusion between moderate autonomy and

moderate control, resulting in insufficient discriminant validity. Thus, this study referenced the practice of Reeve et al. and deleted the moderate autonomy dimension, and finally formed a three-dimensional structure of high control, slight control, and high autonomy. The situational events cover seven typical scenarios such as indoor and outdoor activities, games, and life links, which fully map the spectrum of behaviors from control to autonomy of preschool teachers. Meanwhile, the content validity is further reinforced through systematic screening of expert evaluations by the Delphi method and behavioral response items. Therefore, the test has a good theoretical structure and educational practical adequacy.

4.2. Validity of the Test

The questionnaire had an internal consistency coefficient of 0.87, and the α coefficients of each dimension ranged from 0.74 to 0.89, reaching an acceptable level, indicating that the test had good reliability. From the results of the confirmatory factor analysis, the three dimensions of high control, slight control and high autonomy fit the theoretical conception and have good structural validity. The research distributed questionnaires to 300 teachers and found that preschool teachers had the highest score in the dimension of high autonomy, and there was not much difference among teachers; teachers had the lowest score in the dimension of high control, and there was a large difference among teachers. These are consistent with the conclusions of previous studies, which shows that the assessment tool constructed in this study can effectively measure the level of autonomy support of preschool teachers (Wang, 2018). These results preliminarily support that the assessment tool constructed in this study can be used to measure the level of autonomy support among preschool teachers, but its diagnostic utility, cross-sample stability, and predictive validity for teachers' actual behavior still require further research verification.

4.3. Potential Value of the Test for Teacher Training

Situational judgment tests are based on the assumption of behavioral consistency, which refers to the consistency of individuals' past behaviors being a predictor of future behaviors across situations. In other words, the behavioral options provided by situational judgment tests serve as samples of overall behavioral performance, and the individuals' judgment and selection of the samples provided by the test is a prediction of their current level of behavior and future tendencies. Therefore, situational judgment tests are professional judgments of teachers' concepts and behaviors in the process of implementing nursery education, and it is feasible to use them to examine the possibility of effective support provided by teachers in their interaction with young children. At the same time, the establishment of this assessment tool provides the possibility for teachers' self-diagnosis and improvement. As Landy (2007) said, situational judgment tests are "a kind of alchemy" that can reduce negative impacts and improve effectiveness. The situational judgment tests developed by this study are based on the practice of nursery education in kindergartens and are evaluated by teachers themselves, which can promote teachers' self-evaluation and reflection combined with their own practice experience.

Han et al. (2011) pointed out that teacher autonomy support behavior can be trained. However, previous training for preschool teachers often focused on teachers' teaching ability, and the development of children's autonomy seemed to be emphasized as a concept attached to various training courses or activities, which led to teachers still not knowing how to provide effective support when facing actual problems. Therefore, the application of autonomy support situational judgment tests questions for preschool teachers as training materials in teacher training, and the clarification of abstract concepts into action frameworks that can be referred to, helps to promote the

transformation of training effectiveness and thus improve the level of autonomy support for preschool teachers.

5. Reflection and Prospect

This study constructed the “Autonomy Support Situational Judgment Test for Preschool Teachers” based on self-determination theory, which has produced preliminary evidence in test development and reliability and validity examination, and suggests potential practical application. However, there are still the following limitations: First, the sample is mainly concentrated in some cities, and the geographical coverage is limited. Although convenience sampling is feasible in data collection, it may limit the generalizability of the research findings to preschool teachers and kindergartens in other regions. In the future, the sample range needs to be expanded to enhance the applicability of the tool. Second, although the test situation has been strictly selected, it only covers seven typical situations. In the future, it can be combined with the new educational models of kindergartens (such as STEM activities, mixed-age education) to supplement various situations and improve the dynamic adaptability of the test. Third, the classification of behavioral response items depends on the subjective judgment of experts. In the future, the cognitive mechanisms of teacher decision making can be verified by eye tracking or neurophysiological indicators to strengthen the objectivity of classification.

Looking ahead, the following three aspects can be further investigated: First, the correlation between teacher autonomy support level and children’s developmental indicators (eg. creativity, social adaptability) can be longitudinally tracked, revealing its long-term educational effect; Second, teacher training courses based on test results can be developed combined with situational simulation and reflective log, to explore the integrated “assessment-feedback-intervention” model; Third, cross-cultural comparison of the differences in autonomy support behaviors of preschool teachers in different regions can be made to distill universal and culturally specific strategies, providing empirical basis for educational policy formulation. In addition, the integration of artificial intelligence technology can be attempted to construct a dynamic situational generation system, exploring the possibilities of personalized feedback and real-time assessment.

6. Declarations

6.1. Conflict of interest

The authors declare no competing interests.

6.2. Funding

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6.3. Author contributions (CRediT)

Jianye Fu: Conceptualization; Methodology; Writing—original draft. Fang Jin: Investigation; Data curation; Writing—review & editing. All authors have read and approved the final version of the manuscript.

6.4. Data availability statement

The data supporting the findings of this study are not yet publicly available.

6.5. Ethics approval

This study was approved by the Shenyang Normal University Research Ethics Committee (approval date: 30 January 2026; reference number: 20260130) and was conducted in accordance with its ethical guidelines. Before the interviews and the completion of the questionnaires, written informed consent was obtained from all participating teachers, who were informed of the purpose of the study, the anonymity of their responses, and the voluntary nature of their participation. Classroom observations were conducted after consent had been obtained from the kindergarten

principal and the class teachers, and written informed consent was obtained from the parents or legal guardians of the children observed. Normal teaching activities were not disturbed, and the observation records were used only for research analysis and did not involve any evaluation of the teachers or children.

6.6. Use of artificial intelligence (AI) tools

No generative artificial intelligence (AI) or AI-assisted tools were used in the design of the study, data collection, data analysis, interpretation of the findings, or the writing and editing of this manuscript. The authors take full responsibility for the content of the publication.

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