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Diagnosing Learning Losses and Developing Effective Strategies: Insights from Educators

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Learning loss indicates reduced knowledge and abilities, or delays in academic advancement, resulting from prolonged breaks or disruptions. Several individual and environmental factors affecting the educational process constitute an essential cause of learning loss in students. In recent years, crises such as the pandemic and earthquake in our country have profoundly affected the educational process and caused severe student learning losses. This study aims to evaluate whether teachers' awareness of learning losses at the primary school level and the intervention strategies they apply to identify and eliminate them. In this research, a case study approach was implemented as one of the qualitative research methods, with data gathered through an open-ended interview. This study used a mixed-purpose sampling method. In this context, convenience and maximum diversity sampling techniques were used to determine the participants. 29 primary school teachers from different regions of Türkiye who teach at different grade levels participated in the study. Descriptive and content analysis techniques were employed for data analysis. The study's findings showed that teachers had superficial knowledge about learning losses. Still, they did not have enough knowledge about the intervention strategies that should be implemented for students facing learning challenges. It was revealed that teachers needed more professional training in terms of preparing and implementing intervention programs to prevent learning losses.

Introduction

A fundamental goal of educational frameworks is to ensure that individuals continue their lives equipped with various knowledge and skills. This goal includes academic achievement and vital competencies such as analytical thinking, conflict resolution, social skills, and lifelong learning. However, many factors, such as economic crises, global

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pandemics, and natural disasters in recent years, have profoundly affected educational processes and caused students to experience significant learning loss (Müller & Goldenberg, 2020; Rudling et al., 2023; World Bank, 2020). Especially during the pandemic period, school shutdowns and the shift to remote learning have increased inequalities of opportunity for many students (World Bank, 2020; UNICEF, 2021) and led to deepening learning losses along with deficiencies in other areas of development (Engzell et al, 2021). Therefore, these developments have led to short-term disruptions in education systems and long-term and structural effects on students' cognitive, affective, and social development.

The phrase “learning loss” is generally refer to reductions in students’ knowledge and abilities (Pier et al., 2021); the amount of decline in measured outcomes of students' learning due to some interruption in education (summer terms and especially during the pandemic) (Learning Loss Handbook, 2022); the gap between students’ current knowledge and the knowledge they would have gained if the school closure had not emerged (Angrist et al., 2021); a particular or broad decline in knowledge and abilities, or a delay in academic advancement (Ferian & Sudrajat, 2022; Huong et al., 2020), usually revealed as a result of an extended break or interruption in education. When the definitions of learning loss are analysed, it becomes evident that this concept is expressed as the gap between what students are typically anticipated to know at a particular grade level and what they have learned by that point (Torres, 2021).

Learning loss happens when educational advancement at a slower pace in relation to earlier years historically (Pier et al., 2021), when learning is ineffective, and teachers and students cannot meet for a relatively long period (Ferian & Sudrajat, 2022). School closures and absenteeism due to health problems, economic crises (Hevia et al., 2022), summer vacations (Kuhfeld et al., 2020), adverse weather/climate changes, and natural disasters (Opper, 2024) widen the disparity gap, the likelihood of dropping out, educational marginalization, and learning loss. In general, important potential sources of learning loss include students taking long breaks from schooling during the summer months, students experiencing significant interruptions in their formal education for a wide variety of reasons, students returning to school after having been out of school for an extended period, even several years, prolonged health-related absenteeism, any family decision to withdraw students from school, suspension or expulsion from school, low-quality education (edglossary.org).

Prior to the pandemic, learning loss was primarily associated with summer breaks, during which educational achievement tended to decline, and achievement gaps widened-particularly among poor and working-class students (Kuhfeld, 2019). In recent years, however, prolonged school closures caused by global crises such as the COVID-19 pandemic have triggered far more significant and widespread learning losses. These closures disrupted educational systems worldwide, leading to increased learning poverty and academic regression that may not be easily reversed, even with a rapid return to regular schooling (World Bank, 2020). Similarly, regional crises such as the February 6, 2023, earthquakes in Turkey severely impacted educational access, particularly in affected areas where physical damage and administrative limitations hindered the continuity of learning (Mavi & Tuti, 2023).

Learning losses caused by school closures represent one of the problems that require urgent intervention worldwide (Chen et al., 2021; UNICEF, 2022). These closures have caused substantial and long-term damage to children’s education and overall well-being, with repercussions likely to be more deeply felt in the years ahead (UNICEF, 2022). Recent research shows that while there has been improvement since schools reopened, learning loss

continues (Jakubowski et al., 2023). Learning losses have disproportionately affected poor, students with special needs and those facing disadvantages (Dorn et al., 2020). Learning loss is more likely to occur in disadvantaged students (Ardington et al., 2021; Chen et al., 2021; Dorn et al., 2020; Engzell et al., 2021; Hazin et al., 2021; Kerry & Davies, 1998; Moscoviz & Evans, 2022). If learning losses are not addressed promptly, students will likely fall further behind because of the knowledge and skills they miss out on, and the losses will only increase (Torres, 2021); learning losses will have significant economic impacts on both students and countries (World Bank, 2020); and trying to ensure students receive the help needed to catch up with the curriculum will incur higher costs (Chen et al., 2021). Significant steps are therefore needed to reintegrate children into the school system (UNICEF, 2022). More inclusive and sustainable education models are needed to address learning loss. Developing new solutions and policies, and helping teachers and students adapt, will be key to preventing further learning loss.

The pandemic has increased focus on addressing learning loss, aiming to minimize educational setbacks, reduce disparities in learning, and prevent student dropouts (Hevia et al., 2022). However, although numerous research has reported a decrease in students' academic performance in various countries since the beginning of the COVID-19 pandemic, there is a shortage of study investigating the potential factors that could clarify the differing extents of learning loss (Skedsmo & Huber, 2023). Studies on learning losses are limited regarding the geographical regions analysed (Donnelly & Patrinos, 2022). In this context, more work is needed to identify the causes of learning losses, and reduce them (World Bank, 2022).

An analysis of studies on learning losses revealed that most of the research (Donnelly & Patrinos, 2022; Ferian & Sudrajat, 2022; Storey & Zhang, 2021; Bartholo et al., 2022) were conducted with a review approach based on the literature on the effect of the coronavirus (COVID-19) outbreak on learning losses; learning losses were examined by subject, class and country. A review of both domestic and international literature revealed a limited number of studies focusing on teachers' perspectives on learning losses. Some of these studies aim to assess the perspectives of teachers on learning losses working in the field of classroom teaching (Avcı & Ekici, 2023; Özgürden & Okur, 2022; Sulak & Çapanoğlu, 2022), and some in different branches (Akkaş Baysal & Ocak, 2021; Aydın Ceran & Ergül, 2022; Chen et al., 2021; Kayır & Özçelik, 2018; Noorzally & Mahmud, 2023; Sezgin et al., 2020; Tashtoush et al., 2023; Uyar & Kadan, 2022).

Because teachers can directly observe students' learning processes, they can effectively identify learning loss. Therefore, teachers' perspectives contribute significantly to a comprehensive understanding of learning loss and the design of effective intervention strategies. This study aims to explore teachers' awareness of learning loss and the specific intervention strategies they implement at the elementary school level. Teachers' views play a significant role in determining educational policies, developing reforms, and successfully implementing educational changes (Coburn, 2005; Darling-Hammond, Hyler, & Gardner, 2017; Opfer & Pedder, 2011). In this context, the study anticipates that findings based on teachers' direct experiences will inform and improve policies and practices aimed at addressing learning loss. The following questions were investigated in the research:

- How are teachers' perceptions of the concept of learning loss?
- How do teachers identify the main factors that cause students to experience learning loss?

- What kind of practices do they implement to detect/identify and intervene in learning losses?
- What suggestions do teachers have for the Ministry of National Education, school administrators, and parents to eliminate learning losses?

Method

Research design

This study employed the case study design, a qualitative research method that enables in-depth examination of a specific event or situation (Dawidowicz, 2011). In the study, the case study design was used to comprehensively analyse primary school teachers' views and diverse experiences regarding learning loss, to examine the causes of learning loss and its triggers in detail, and to develop innovative solutions from different perspectives.

Study group

This study employed convenience sampling and maximum diversity sampling techniques, which are variations of purposeful sampling methods. Johnson and Christensen (2012) use the term "mixed-purpose sampling method" for this type of research, where more than one sampling method is employed. The convenience sampling technique is one in which the study participants are easily accessible (Berg, 2001; Yin, 2011). In this sampling method, the researcher selects participants based on their ease of accessibility (Martínez-Mesa et al., 2016). The researcher then establishes the inclusion criteria and approaches any member of the target population who is available and meets these criteria (Golzar, Noor, & Tajik, 2022). In this context, the participants were initially reached through the researchers' personal and professional communication networks. Communication was established through social media platforms (such as WhatsApp and email groups) and colleague referrals. Although no open call was made to the participants, the teachers who were reached directly and indirectly were informed about the purpose of the study, the principles of confidentiality, and the principles of voluntary participation, and participation in the study was provided entirely voluntarily. The inclusion criterion was that teachers were actively working in an educational institution. No age or seniority restrictions were imposed, which facilitated the research by allowing data to be obtained from diverse experiences and contexts. In this study, maximum variation sampling was also used to ensure the representativeness and diversity of the participants. To ensure maximum diversity, the study aimed to include primary school teachers from different regions of Turkey, provinces, and grade levels. The sample consisted of 29 primary school teachers employed in different cities across Türkiye. Twenty-four female and five male teachers participated in the study. All participants participating in the study signed an informed consent form. The demographic characteristics of the participants are presented in Table 1.

Table 1. Demographic characteristics of the participants

Professional experience	f
1-5 years	5
6-10 years	7
11-15 years	5
16-20 years	6
21 years and above	6
The grade level taught by the teacher	
1st grade	5
2nd grade	6
3rd grade	12
4th grade	6
Total	29

Table 1 shows that the teachers participating in the study have varying levels of professional seniority. Most of the teachers have 11 years or more of experience. Additionally, when considering the grade levels they teach, it is evident that the majority of the teachers instruct 3rd-grade students.

Data collection tools

In the study, a semi-structured open-ended form developed by the researchers was employed to collect data. It was prepared using Google Forms to provide easy access to participants and make the data collection process practical. The data was collected online. The form consists of short-answer questions for gather demographic information and open-ended questions to explore deeper insights into the research subject.

To ensure the validity of the form, it was sent to two experts in the field of educational sciences and qualitative research before the application, and they were asked to evaluate the form. Then, a pilot study was conducted with five teachers who were like the target group, and they were asked to indicate whether the statements in the form were clear and understandable. The finalized form was then distributed via e-mail and social media and the participants.

Data analysis

In qualitative research, descriptive analysis or content analysis is widely used in the analysis of collected data (Yıldırım & Şimşek, 2016). In the same research, these analyses can be used separately or together to analyse data (Baltacı, 2019). Descriptive analysis is the summarization and interpretation of data within the framework of determined themes (Patton, 2018; Yıldırım & Şimşek, 2016). Descriptive analysis aims to present the data collected from interviews and observations to the reader in an organized and interpreted manner (Yıldırım & Şimşek, 2016). Content analysis, in contrast, is a structured approach for systematically coding and categorizing textual information. It is used to discover significant textual information to determine the trends and patterns, frequencies, and relationships used in a data set. This analysis involves a detailed exploration of the collected data to uncover relevant concepts, categories, and themes (Graneheim, Lindgren, & Lundman, 2017).

In this study, descriptive and content analysis were used together to provide an in-depth and holistic analysis. First, descriptive analysis was employed to provide a broad overview of the

participants' responses. At this stage, the basic features of the dataset and the common views among the participants were revealed. Following this, content analysis was conducted to enable more detailed examination of the qualitative data. In this phase, two researchers manually coded the responses independently, identifying meaningful units and initial codes and the data was quantified by measuring the frequency of the codes and categories created. A third researcher then reviewed these codes to ensure consistency and resolve any discrepancies, thereby enhancing the reliability of the coding process. Discrepancies that arose during coding were resolved through discussions among the researchers, resulting in a consensus on the final code set. Themes were developed inductively from the codes. The researchers collaboratively discussed the codes, merging similar content and consolidating them into broader thematic categories. Descriptive analysis was also used to explain the codes, categories and themes created by making direct quotes from the participant views.

Validity and reliability

The validity and reliability of the study were tried to be ensured by using various strategies. There are two basic approaches to structuring the consensus process to increase the validity of research findings in qualitative research. The first is to measure inter-coder agreement. This process uses quantitative measures of coding agreement by two or more independent coders to determine coding reliability. The second approach is a consensus-based process, where coders independently codes the data, compare their codings, and discuss any discrepancies to reach an agreement rather than measuring them (Forman & Damschröder, 2007). In this study, the second approach was used to increase consistency. The data were analysed separately by the first two researchers. Then, the codes created were reviewed by the third researcher to ensure consistency and eliminate inconsistencies. Then, an impartial expert, other than the researchers, examined the codes and themes. Among the coders, regular consensus meetings were held to ensure coding agreement, and the validity of the thematic structure was carefully evaluated. Also, to ensure internal validity, the opinions of field experts were sought to validate the scope and language of the open-ended form used as a data collection tool.

Findings

The research findings were grouped under the main themes of primary school teachers' views on the concept of learning loss, the main factors that cause students to experience learning loss, teachers' in-class/out-of-class practices for identifying learning loss, approaches/strategies used to prevent/remediate learning loss, suggestions and expectations for remediation of learning loss.

In consequence of the content analysis of the data gathered to determine teachers' awareness of the concept of "learning loss", four sub-codes related to the definition of learning loss emerged. The sub-codes about learning loss are shown in Table 2.

Table 2. Primary school teachers' opinions on the concept of learning loss

Themes	Codes	Frequency (f)
Forgetting knowledge	-Learning is not permanent due to certain reasons (earthquake, migration, epidemic, etc.)	4
	-Failure to remember previous learning	3
	-Failure to internalize knowledge	2
	-Not using the knowledge	1
	-Interruption of education	1
Learning deficiencies	-Failure to learn the information completely	2
	-Inadequate learning of the skill to be acquired	2
	-Falling behind the class level	
	-Failure to achieve the program outcomes	2
	-Cognitive retardation	1
	-Inability to access information due to various problems	1
		1
Access problems to the learning environment	-Staying away from the learning environment	3
Decline in learning outcomes	-Decline in learning outcomes observed at different times	2
	-Not being able to update old information, not being able to add new information	1

When the data collected to determine primary school teachers' awareness of the concept of learning loss were analysed, it was revealed that teachers presented opinions under the themes of "forgetting knowledge," "learning deficiencies," "access problems to the learning environment," and "decline in learning outcomes." Although "problems accessing the learning environment" are not directly related to learning loss, it suggests that teachers know the leading causes.

Table 3. Main factors causing students to experience learning loss

Themes	Codes	Frequency (f)
Factors related to the teaching and learning process	-Teaching and learning process in the classroom	15
Family and social environment factors	-family problems	7
	-working children	2
	-environmental conditions	4
	-migration	1
Student's individual characteristics and disabilities	-learning disabilities	5
	-genetic factors	1
	-language barrier	2
	-reading problems	1
School absenteeism and staying away from school	-staying away from school	5

Table 3 presents the views of participants regarding the key factors contributing to learning loss in their classroom. As shown in Table 3, the most frequently cited cause of students' learning loss was related to the teaching and learning process. While T11 expressed his views on this issue as *"Failure to complete the activities that will help reinforce learning during the process in the learning environment...*", T24 expressed his opinion as "*Teachers' inability to spend enough time to repeat the subjects due to the effort to catch up with the MoNE curriculum, and also the inability to repeat the subjects in crowded classes...*". Similarly, T26 stated that "*Reasons such as not repeating the information learned, not putting it into practice, not integrating it into daily life cause learning losses*". According to teachers, family

and social environment factors are also key causes of learning loss, with "problems within the family" such as lack of support, divorce, and indifference —being particularly significant. “School absenteeism and staying away from school’ were also frequently mentioned by teachers as important factors causing learning losses.

Table 4. Teachers opinions on strategies for identifying learning loss

Themes	Codes	Frequency (f)
Activity-based classroom applications	-writing activities and dictation	3
	- play	1
	-read aloud	1
	-reading comprehension studies	1
	-project-based work	1
Measurement and evaluation methods	-observation	6
	-outcome assessment studies	3
	-multiple choice/fill in the blank test	2
	-readiness tests	2
	-formative assessment	2
	-interim evaluation	1
	-open ended questions	1
	-self assessment	1
	-worksheets	2
Technology and digital tools	-Web 2.0 tools	2
Collaboration and support services	-cooperation with the guidance service	1

Teachers' views on the practices used to identify students with learning loss are presented in Table 4. As shown in Table 4, teachers' opinions on identifying learning losses are categorized under four themes. It was determined that teachers primarily relied on measurement and evaluation studies to assess learning losses and that both traditional and alternative measurement and evaluation tools were employed in this process. The practices that teachers mentioned most after measurement and evaluation studies were activity-based classroom practices. It was stated that observation was used the most in this process. In addition, teachers stated that they determined students' learning losses by utilizing technology and digital tools, as well as collaborating with the guidance service.

Table 5. Approaches/strategies used to prevent/recover learning losses

Themes	Codes	Frequency (f)
Social support and collaborative approaches	-peer support	5
	-parent cooperation	5
	-cooperation with the guidance service	1
Teaching and individualized support	-subject repetition	3
	-individual support and individualized instruction	3
Interactive classroom activities	-instructional technologies and digital tools	3
	-classroom activities	2
	-drama	2
	-reading circle	1
	-game	1
Assessment and feedback	-feedback and clarification	2
Motivation and reinforcement	-reinforcement and motivational activities	2
	-worksheets	2

Teachers' views on strategies used to prevent or recover learning loss are presented in Table 5. According to Table 5 teachers' strategies to prevent or recover learning loss are grouped into five themes: social support and collaboration, individualized teaching, interactive activities, assessment and feedback, and motivation. Peer support was the most frequently used strategy within social support and collaboration. Most teachers reported using peer support to minimize learning losses and cooperating with parents to reinforce learning at home and ensure its permanence. One of the noteworthy situations in the data is that teachers give less space to individual support and individualized instruction. Subject repetition, individual support and instruction, and interactive classroom activities are also among the intervention approaches that teachers use to prevent or recover learning losses in their classes. Additionally, teachers stated that they benefit from using teaching technologies and digital tools, as well as drama, literature circles, games, assessment, feedback, motivation, and reinforcement studies, to recover learning losses. All teachers highlighted that they did not have a written and ready intervention program.

Table 6. Recommendations for addressing learning losses

Policy Recommendations for Addressing Learning Losses		
Themes	Codes	Frequencies
Training and Support Strategies	-family education	4
	-material support	3
	-teacher education	1
	-online education	1
	-online content production for individual student work	1
Intervention Strategies	-compensation programs	1
	-opening courses outside of class hours	1
	-early detection and identification studies	1
	-absenteeism tracking	1
	-determining the level/readiness level	1
	-reducing the number of students in the class	1
	-making the practice of repeating a year (failing a grade) functional	1
Curriculum and Assessment Strategies	-curriculum adjustment	2
	-development of assessment tools	1
	-improvement/editing of textbooks	3
	-compulsory review of the previous year's subjects in the first month at the beginning of the semester	1
	-minimizing the age difference between groups	1

Table 6 presents teachers' policy recommendations to the MoNE for addressing learning losses. As illustrated in Table 6, the recommendations offered by the teachers to recover learning losses include interventions for individual students and structural changes in the education system. Teachers' policy development suggestions for the Ministry of National Education were categorized under the themes of "training and support strategies," "intervention strategies," and "curriculum and evaluation strategies". Family education and material support are among the suggestions frequently offered by teachers within the scope of training and support strategies to recover learning losses. Within the scope of intervention strategies for students, teachers' suggestions for MoNE include compulsory remedial programs, early identification and detection, absenteeism follow-up, compulsory repetition of the year for unsuccessful students, and reduced class sizes. T3 made the following suggestion regarding the follow-up of absenteeism: "*Preventive and remedial activities should be implemented by identifying the causes of learning losses. For example, seasonal agricultural*

worker students should be followed up, and their school attendance should be ensured in the provinces where they are located." T13 stated, "*Compensation programs should be made for student's absences due to compulsory reasons*". Among the suggestions made to MoNE within the scope of curriculum and evaluation strategies, it is frequently emphasized that textbooks and curricula should be adjusted. T24: "*The curriculum should be reduced in primary schools, especially for mathematics, the time for basic skills should be increased, and a student should never move to upper grades without literacy skills. Schools should be able to offer after-school courses for children with learning loss*". At the same time, T12 emphasized the measures that should be taken to prevent learning loss by saying, "*MoNE should use a spiral curriculum structure in the content of textbooks, the subjects should be interconnected so that the next subject should remind the previous subject*."

Table 7. Expectations from the school administration and families

Themes	Codes	Categories	Frequencies
Expectations from school administration	Providing supportive environment and resources	-create support classes for students	2
		-resource provision	3
		-allocate time and space for a compensation program	1
		-improving the learning environment	1
		-creating workshops and skill-based classes	1
	Cooperation and communication	-parent and teacher cooperation	3
		-making more active use of guidance services	3
	Prevention and monitoring of learning loss	-identify and track learning loss	2
		-ensuring equality between classes in terms of the number of students with learning loss	1
	Training and compensation programs	-compensation courses and summer schools	2
Expectations from families	Support and follow-up of the learning process	-repetition at home of what is learned at school	3
		-support at home	
		-book reading and continuous follow-up	3
		-care and interaction with the child	2
		-discovering and developing the student's potential	3
			2
	Cooperation and communication with the teacher	-coordinated work and cooperation with the teacher	5
		-supporting the teacher	2
	Awareness and education	-awareness and training of the family on child development	3
		-learning loss prevention and intervention	3

Teachers' expectations from school administration and parents regarding to prevent learning loss are shown in Table 7. As demonstrated in Table 7, participants' expectations from school administration reflect a wide range of solutions to prevent and address learning losses. These expectations address both individual student needs and broader school policies, grouped under the following categories: "supportive environment and resources," "cooperation and communication," "monitoring and prevention," and "training and compensation programs." Teachers emphasized the need for support classes outside school hours, dedicated time and space for remedial programs, and material resources. They also emphasized the importance of activating the guidance service, monitoring and addressing absenteeism and providing training to students, parents, and teachers. Strengthening parent-teacher collaboration was seen as key to addressing learning losses. As shown in Table 7, teachers expect school administrations to take an active role, offering solutions ranging from individual support to school-wide planning. Key expectations include parent-teacher cooperation, active guidance services, well-organized remedial programs, material support, and effective learning environments. T15 emphasized his opinion on creating support classes: "*If the number of students with learning loss is high, a class should be created outside of school hours to support these students*." T3 emphasized the necessity of communication with the guidance service by saying, "*Teachers, parents, and guidance services should provide planned and programmed cooperation*."

When the teachers' expectations were analysed, it was revealed that teachers expect families to play an active and supportive role in their students' education by fostering academic achievement, maintaining open communication with teachers, and providing a conducive learning environment at home. While T5 stated, "*Families should participate in activities to prevent learning loss by keeping them away from school during summer vacations*," T24 stated, "*Families should know their children very well and inform the teacher about this issue. They should inform the teacher about any disability, psychological distress, etc., in the student. They should constantly communicate with the teacher and provide the necessary support to their children at home to overcome their children's learning losses*" and emphasize the importance of family-school communication.

Discussion & Conclusion

The first sub-question of the study aims to reveal primary school teachers' awareness of learning loss. When the findings regarding the primary school teachers' awareness of the concept of "learning loss" are examined, the fact that the teachers defined learning loss by drawing attention to elements such as "forgetting," "learning deficiencies," "problems in accessing the learning environment" and "decrease in learning outcomes" shows that they have conceptual awareness on this issue, at the beginning level. In this context, the awareness levels of primary school teachers about the concept of "learning loss" draw a positive picture in terms of understanding the concept in general dimensions. This finding is consistent with results from previous studies (Akkaş, Baysal, & Ocak, 2021). The study findings revealed that teachers perceive learning loss as both an individual and a broader systemic problem. When explaining the challenges they face in accessing a learning environment, teachers argued that learning loss is linked not only to student effort but also to educational inequality and limited opportunities. This view is supported also by various studies (Dorn et al., 2020; Kuhfeld et al., 2020; Reich et al., 2020) indicating the impact of socioeconomic and infrastructural differences on learning loss. Therefore, intervention studies targeting learning loss should also examine these underlying factors.

The second sub-question aims to identify teachers' perspectives on the main reasons for learning losses in their classrooms. According to the research results, teachers associate students' learning losses with the "teaching-learning process in the classroom" to a great extent. Teachers stated that inadequacies in the in-class teaching process, especially the lack of subject repetition, incomplete activities, and the failure to integrate lessons into daily life, lead to learning loss. Teachers explain the lack of efficiency in classroom processes with factors such as the inability to fully realize the activities under the pressure of the curriculum and the large class size. Mostly emphasized by teachers "family and social environment factors," shows that learning loss is not only limited to the processes at school but that environmental and emotional factors at home negatively affect the learning process. Divorced family structure, lack of interest, and lack of family support were listed as the factors that led to increased learning loss among students. In addition, according to teachers' views, students' learning difficulties and absenteeism are among the other causes of learning losses. Various studies have also revealed that teachers have students with learning loss in their classes for different reasons: Absenteeism (Noorzally & Mahmud, 2023); insufficient parental support, interaction-participation problems (Aydın Ceran & Ergül, 2022; Haser et al., 2022), insufficient time (Aydın Ceran & Ergül, 2022), socio-economic problems (Haser et al., 2022; Noorzally & Mahmud, 2023), seasonal agricultural labor (Avcı & Ekici, 2023). The study conducted by Uyar and Kadan (2022) also reveals that teachers believe that learning losses are caused by family, students, teachers, school administrators, and the education system. These factors generally indicate the individual and environmental difficulties of the students and emphasize the necessity of timely recognition and intervention of such problems. Providing flexibility to teachers in the implementation of the curriculum and reducing crowded class sizes are of critical importance in preventing learning losses. Making the teaching-learning processes in the classroom more effective, increasing family participation, and early diagnosis of individual learning difficulties play an important role in reducing learning losses. The results of this research indicate that the factors contributing to learning losses are diverse and that a multifaceted approach is necessary to prevent and mitigate these losses.

When the teachers' views on the practices they use to determine students' learning losses in their classes were examined, it was revealed that they mainly employed measurement and evaluation activities. In addition, it was determined that teachers implemented activity-based classroom practices and collaborative studies with the guidance service. This study's findings show that the observation technique is a frequently used method by teachers to identify students' individual needs and evaluate their in-class performance. It is also emphasized in the literature (Aydın Ceran & Ergül, 2022) that teachers use measurement and evaluation studies to prevent and compensate for students' learning losses. In addition, Singh et al. (2020) emphasized the role of formative assessment in addressing learning losses. In our study, it was found that very few teachers conducted collaborative studies with the guidance service. However, the promotion of a favorable school climate, along with in-school counselling and mental health services, has been shown in the literature to be effective practices in intervening in learning losses (Page et al., 2021). Indeed, Psifido, Muradoğlu, and Farazouli (2021) state that guidance and counselling make significant contributions in terms of taking supportive measures by applying comprehensive strategies for at-risk students, providing education based on student's interests and abilities, and minimizing the risk of inadequate information. In this context, the necessity of strengthening cooperation with school guidance and counselling services to contribute to the development of intervention measures for students' learning losses is one of the concrete outcomes of this research.

The fourth sub-question of the research is to identify the practices that primary school teachers employ to prevent or mitigate learning losses. Upon examining the study findings, it was revealed that primary school teachers employed social support and collaboration-based approaches, individualized instruction, interactive classroom activities, evaluation and feedback, and motivation and reinforcement strategies to compensate for learning losses. Teachers emphasized peer-supported studies and family collaboration the most within the scope of social support and collaboration-based studies. In addition, subject repetition, providing individual support, and individualizing teaching are among the approaches and strategies that teachers use to prevent learning losses. The findings of this study are consistent with those of Sulak and Çapanoğlu (2022), which highlight that primary school teachers prefer the use of digital tools, communication with families, individualized meetings with students and parents when necessary, educational activities and materials, homework supervision, and additional subject videos to mitigate learning losses. A review of studies on intervention strategies for addressing learning gaps revealed that several strategies successfully addressed learning gaps and strengthened instruction. It has been stated that differentiated education is effective in eliminating students' learning losses, increasing academic performance, and meeting individual learning needs (Aguhayon et al., 2023). Cooper (2003) also presented prolonging the school year by a few days and implementing summer programs as effective strategies in eliminating the learning losses of students. One of the striking results of our research is that none of the teachers used an intervention program specifically tailored to the student group to compensate for learning losses. In this context, one of the important outcomes of this research is that it reveals that teachers need more professional development in areas such as providing individual support and preparing special intervention programs to prevent and compensate for students' learning losses. Kashefpakdel et al. (2021) emphasize that teachers should help students by using various methods to address learning losses, including remedial programs, accelerated education programs, compensatory learning programs, and intensified curricula. In this context, it is possible to say that primary school teachers require training in preparing intervention programs to identify and eliminate learning losses, in line with the results of our research.

As a result of the research, teachers submitted suggestions to the Ministry of National Education regarding training and support for addressing learning losses, developing intervention strategies for students, and implementing structural changes within the curriculum. The research revealed that teachers need family education and material support. Among the intervention strategies for students, approaches such as mandatory compensation programs and courses, early diagnosis, and diagnosis stand out. Monitoring absenteeism and reducing class sizes are also among the policy suggestions offered by teachers that require constructive changes in the education system. Upon examining the literature, as in our study findings, it has been revealed that certain practices are effective in mitigating learning losses. Pan and Sass (2020) emphasized in their study, based on a literature review, that it is possible to compensate for learning losses through practices such as increasing teaching time, extending the school year, implementing small-group teaching activities, and providing private lessons. In addition, their studies have shown that the widening gaps in learning loss depend on the learning support provided to the child at home and the learning resources available at home. According to UNICEF (2020), parental and family support are emphasized as important factors in reducing learning loss. Defeyter et al. (2021) suggested that, in the medium and long term, extended school days, such as pre-and post-school education, as well as holiday clubs or camp education, are effective in mitigating learning losses. Additionally, Kaushik (2020) found that the accelerated education program is effective in mitigating learning losses.

Teachers' expectations from school administrations to eliminate learning losses constitute a wide range of solutions. Expectations gathered under headings such as providing a supportive environment and resources, cooperation and communication, and developing the learning environment reveal that school administrations should play an active role. Teachers expect families to take an active and conscious role in preventing learning losses by supporting education, maintaining open communication with teachers, and ensuring a supportive home learning environment.

The results of this study show that teachers develop various strategies to reduce learning losses, but they require a more structured and systematic approach in certain areas. To implement structural reforms in the education system, the active involvement of school administrations and families in the teaching and learning process, as well as the implementation of teachers' suggestions, is critically important to prevent learning losses. Giannini et al. (2021) emphasized the critical role of teacher education in overcoming learning loss. Various studies have put forward different suggestions from teachers for compensating for learning losses. Increasing teacher-parent cooperation (Akkaş Baysal & Ocak, 2021; Avcı & Ekici, 2023; Sulak & Çapanoğlu, 2022), family education (Avcı & Ekici, 2023); repeating the current year (Akkaş Baysal & Ocak, 2021); providing additional lessons (Uyar & Kadan, 2022), implementing remedial programs (Uyar & Kadan, 2022; Sulak & Çapanoğlu, 2022; Özgürden & Okur, 2022), courses and private lessons (Sulak & Çapanoğlu, 2022), repeating topics (Uyar & Kadan, 2022), making changes in the curriculum (Sulak & Çapanoğlu, 2022), using interactive programs (Kayır & Özçelik, 2018), extending lesson periods (Uyar & Kadan, 2022), summer schools (Avcı & Ekici, 2023; Kayır & Özçelik, 2018), complementary and repetitive studies (Özgürden & Okur, 2022) are among the suggestions made by teachers for compensating for learning losses. In addition, implementing psychosocial support for students, teachers, and parents through home visits and invitations to school, as well as mentoring practices for teachers, parents, and students, are also among the recommended practices for compensating for learning losses (Hazin et al., 2021).

Implications and recommendations

This study offers some implications for teacher education and national educational policies. The study revealed that teachers perceive learning loss not only as a result of student-related problems but also as a systemic and environmental problem. In the context of studies on learning loss, the factors that cause these losses should be analysed in depth.

Additionally, one of the important indicators of the research is that learning losses are generally associated with the inadequacy of the learning and teaching processes in the classroom. Anxiety about completing the curriculum, crowded classrooms, and factors related to family and social environment have been identified as the main reasons for learning losses. In this context, it has been observed that teachers should acquire knowledge and experience to develop effective strategies that compensate for learning losses in the classroom and that cooperation with the family is essential.

The most important implication of this study that should be taken into consideration is that teachers lack the necessary skills to develop effective intervention programs for detecting and addressing learning loss**.** It has been revealed that participants lack adequate knowledge about the intervention strategies that should be applied to students with learning loss. They need more professional training in preparing and using intervention programs to prevent and eliminate learning loss. In this context, teacher candidates and teachers should be trained to

prepare intervention plans to identify and eliminate learning loss. Teachers need to be more proactive in designing and implementing intervention programs for learning loss. In this context, providing teachers with in-service training on differentiated instruction and developing an intervention program will increase their competence in planning and implementing intervention programs. Additionally, teachers' research literacy skills should be developed, and they should be encouraged to conduct school-based action research. These studies will enable teachers to systematically observe and evaluate their classroom practices, becoming active learning designers. Professional learning communities can also enable teachers to develop intervention strategies for addressing learning loss, share their experiences with learning loss, and collaborate on developing collective solutions to common problems. In addition, intervention plans should be prepared with expert teams to eliminate learning loss, and the effectiveness of the prepared intervention plans should be evaluated with an experimental study. Moreover, a detailed quantitative study is needed to reveal the impact of learning losses more comprehensively. Including such a quantitative dimension in the study can complement the insights gained from qualitative data and provide a more holistic assessment.

Limitations

This study has some potential limitations. The first is that this study is a descriptive study based on teachers' views. One of the critical limitations of the study is that the data obtained is limited to teachers' views only. To increase the validity of the study, intensive, long-term, repeated observations should be conducted to ensure a complete and in-depth understanding of the field situations. The second is that in this study, learning losses encountered at the primary school level were attempted to be described in general. More specifically, learning losses experienced on a class or course basis can be determined through observation and interviews. The collection of research data using an open-ended form in the study can also be seen as a limitation. The superficial and brief answers of some participants to specific questions affected the depth of the data for those questions. Therefore, face-to-face interviews may provide more effective results in similar studies.

All rules included in the “Directive for Scientific Research and Publication Ethics in Higher Education Institutions” have been adhered to, and none of the “Actions Contrary to Scientific Research and Publication Ethics” included in the second section of the Directive have been implemented.

Declarations

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Ethics Statements: *Ethical approval was obtained from the Kırıkkale University. It was confirmed that the research complied with ethical standards and was performed in accordance with relevant guidelines/regulations. For the current study, Kırıkkale University Social and Human Sciences Research Ethics Committee decision has been taken (Date: 11.02.2025, document number: 315939).*
Conflict of Interest: *There are no financial or other material conflicts of interest that could influence the results or interpretation of the article. The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.*
Informed Consent: *On the open ended questionnaire's front cover, there is an informed consent text stating that the purpose of the study, participation in the study is on a voluntary basis. After reading and approving the existing text, teachers completed the questionnaire. The participants were all adults, and their participation is entirely voluntary. The personal data from all participants has been anonymized.*
Data availability: *The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request*.

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