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# Challenges, Innovations and Recommendations for Strengthening Educational Resilience: The Post-Earthquake Experiences of Teachers in Kahramanmaraş Region

Research Article

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## ABSTRACT

The aim of this study is to examine the resilience in education in line with the opinions and experiences of teachers working in the region after the earthquakes that occurred in ten provinces based in Kahramanmaraş on February 6, 2023 and to develop innovations and suggestions for strengthening resilience within the scope of the normalizing and curative role of education. The research is within the scope of qualitative research and is patterned with descriptive case study. The teachers participating in the research were selected according to the maximum diversity sampling and the data were collected using a semi-structured interview form. Content analysis technique was applied to analyze the data. As a result of the research; the problems experienced by teachers working in the earthquake zone during and after the earthquake process, the difficulties they face and the solutions they have developed, as well as suggestions and expectations aimed at increasing the resilience of education to natural disasters have been revealed.

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Earthquake, Endurance in Education, Natural Disaster

## Introduction

Throughout the ages of human history, natural and human-made disasters have been profound tests of our resilience, adaptability, and ability to rebuild a semblance of normalcy in their aftermath. Disasters, which include events of both natural and human-made events, have always left an indelible mark on the environment and the lives of the people who live in the affected regions. They have caused profound destruction of both

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the physical environment and the social fabric, often resulting in staggering losses. In this sense, disasters are the crucible through which societies are severely tested and their capacity to recover and adapt is revealed.

Classifying of disasters into two categories -natural and human-made allows for a more nuanced understanding of their causal factors, dynamics, and the variables that make them unpredictable, recurrent, and devastating. Natural disasters, born of the vagaries of nature, possess an inherent unpredictability that shapes their occurrence in terms of time, place, and form. These events have a profound impact on human life, resulting in the loss of life, property, and livelihoods. Human-made disasters, on the other hand, emerge from a web of political, economic, and social upheaval, often compounded by significant events (Cavallo & Noy, 2011). In recent decades, global changes and transformations in the climate system have unleashed an alarming trend - an increase in natural disasters of unprecedented magnitude and frequency. In the last half-century, the number of natural disasters has quintupled, underscoring the relentless disruption of our planet's delicate balance. Among these natural disasters, earthquakes stand out as a pervasive and profoundly destructive force (CRED, 2015; Aydın, 2019; Goldstein, 2021). These seismic upheavals, caused by the sudden release of energy as rocks rupture beneath the earth's surface, have always been the most threatening adversary to humanity.

For Turkey, the seismic vulnerability stemming from its geological disposition on active fault lines has earned it the moniker of an "earthquake country" (Gündüz, Türkmen, Eryiğit, Karaca & Aydın 2013; Zhang, Fung, Johnson & Sattar, 2022; Bilen & Polat, 2022;). This epithet is not unwarranted, given its history of seismic turbulence. The harrowing events of February 6, 2023, bear testimony to this grim reality, as earthquakes of magnitudes 7.8 and 7.7 shook the province of Kahramanmaraş (AFAD, 2023; USGS, 2023), triggering a domino effect that reverberated across ten adjacent provinces, leaving in their wake widespread devastation and loss (Zilio, Galasso, Gürer, Aslin, Lachowycz, Müller & Su, 2023).

These earthquakes, along with the numerous aftershocks that followed, tragically killed more than 50,000 people and left countless others facing the grim aftermath. The lives of nearly 15 million people in the region were directly and severely affected. The Ministry of National Education (2023) reported that 24 schools were destroyed and 83 others severely damaged as a result of these disasters. Authorities resumed the education process, setting up tents, containers and prefabricated classrooms to ensure that preschool, primary and secondary school students could continue to learn in a safe and structured environment. In addition, more than 20,000 teachers were deployed to the region to provide psychosocial support to students and children whose lives had been upended by the disaster. Educational materials and lifelong learning activities were initiated to facilitate the continuity of education and to mitigate traumatic experiences. Meanwhile, many students moved to other provinces after the earthquake.

Continuing the educational process after natural disasters such as earthquakes is one of the most effective ways of dealing with the destruction, trauma and psychological difficulties caused by disasters. Therefore, as Le Brocque et al. (2017) emphasize, in order to protect children, who are the most vulnerable members of society, from the risks that may arise, it is crucial to initiate and ensure the continuity of normal educational processes as soon as possible after disasters in order to heal the wounds of society. In the educational process following natural disasters such as earthquakes, teachers play a key role in meeting the psychological and physiological needs of students, improving their psychosocial health, and helping them to cope emotionally with the losses or pain they have experienced (Devaney, Carr & Allen 2009). Teachers play a central role in this phase of educational recovery. They are responsible for meeting students' psychological and physiological needs, enhancing their psychosocial well-being, and helping them cope with the emotional upheaval and loss they have experienced. As the first point of contact for students, teachers, in collaboration with families, play a critical role in ensuring that the educational process resumes in a safe environment and in contributing to rehabilitation and recovery efforts (CDC, 2023). As such, teachers are undoubtedly one of the key actors in facilitating the post-disaster normalization process.

On the other hand, it is imperative to recognize that disasters affect teachers as profoundly as they affect society as a whole. Teachers not only deal with the loss of life and property but also experience a variety of psychological and social consequences in the aftermath of such disasters. As they struggle to survive amid adversity, teachers are also tasked with meeting the professional demands that are critical to normalization. Their professional responsibilities are compounded by personal losses, adding to the burden and responsibility of practicing their profession under difficult circumstances. In this sense, as underlined by INEE (2010), support for teachers in disaster areas is of paramount importance. This includes improving their living conditions, providing psychological support, and responding to their needs and demands. Recognizing the basic humanity of teachers, it is both unrealistic and unfair to expect them to perform superhuman feats in times of adversity. The existing literature, as highlighted by Seyle et al. (2013), clearly supports the need for psychosocial understanding and support for teachers following natural disasters or traumatic events. Promoting stability and continuity is a cornerstone in addressing the lingering effects of an earthquake and improving the overall well-being of teachers. It is a key factor in the transition to normalization and an integral part of the restorative potential of education, as Carlson asserts. The existing literature, as highlighted by Seyle et al. (2013), clearly supports the need for psychosocial understanding and support for teachers following natural disasters or traumatic events. Promoting stability and continuity is a cornerstone in addressing the lingering effects of an earthquake and improving the overall well-being of teachers. It is a key factor in the transition to normalization and an integral part of the restorative potential of education, as Carlson et al. (2010) asserts. In light of these considerations, this paper aims to reveal the experiences of teachers in the region after the Kahramanmaraş earthquake on February 6, 2023, the difficulties they faced, and the solutions they developed for these difficulties. By delving into these educators' experiences, solutions, and recommendations, we hope to support ongoing natural disaster recovery efforts and contribute to the body of knowledge guiding disaster recovery and resilience in education

To that end, this study seeks to answer the following key questions:

1. What problems did teachers face in the provinces affected by the earthquake?
2. What solutions did teachers develop to solve their problems?
3. What are their recommendations for mitigating the problems they encountered during and after the earthquake and improving the education system's overall resilience in the face of future disasters?

Addressing these questions, the research is expected to provide valuable insights to inform future natural disaster recovery initiatives, provide practical guidance for improving educational sustainability, and contribute to the broader knowledge base on disaster recovery and sustainability in education.

## **Method**

### **Research Design**

This study employs a descriptive case study design to address the difficulties and solutions experienced as a result of the earthquake from the perspective of the teachers who experienced the earthquake. The case study is a qualitative research approach in which one or more situations, limited in time, are studied in depth using data collection tools (observation, interviews, audiovisual documents, reports) and the emerging themes are defined (Creswell, 2013). A descriptive case study is a type of case study designed to describe a phenomenon as a case in its real-world context. Descriptive case studies allow researchers to present a situation that is rarely encountered or normally inaccessible to researchers. The descriptive case studies deal with the "how" of a situation (Yin, 2018).

### **Research Group**

The study group of the research consists of teachers working in public primary, secondary and high schools in 10 earthquake affected provinces, (Kahramanmaraş, Malatya, Osmaniye, Kilis, Adıyaman, Hatay, Diyarbakır, Adana, Şanlıurfa, Gaziantep) centered in Kahramanmaraş. The study group was selected using maximum diversity sampling, which is one of the purposive sampling methods. According to Patton (2014), this method allows the phenomenon under study to be examined in depth, with different experiences from different stakeholders, assessing the situation from different perspectives and collecting rich data. In this context, the research group consisted of teachers who were teaching in tent cities and permanent school buildings due to the destruction caused by the earthquake, and who volunteered to participate in the research. Table 1 provides demographic information about the participants.

**Table 1.** Demographic Information of Participants

Code	Gender	Age	Seniority	Education Level	Branch	Level
T1	Male	29	6	BS	Maths	Middle School
					Turkish language and literature	High School
T2	Female	38	11	MS	Electrical- Electronics	High School
T3	Male	44	21	BS	English	High School
T4	Male	47	25	BS	science	Middle School
T5	Male	36	14	MS	Religious Culture and Ethics B.	Middle School
T6	Male	25	3	BS	Turkish	Middle School
T7	Female	35	13	MS	Class Teacher	Elementary School
T8	Female	41	17	MS	Class Teacher	Elementary School
T9	Female	33	9	BS		

As Table 1 shows, the gender distribution of the participants is balanced. The average age of the participants is 36 and the average number of years of service is 13. Most of the participants have a Bachelor's degree (BS) and a few have a Master's degree (MS). Most of the teachers work in secondary schools and the fewest in primary schools.

### Instrument

The data required for the study was collected using a semi-structured interview form developed by the researchers. Patton (2018) was used in the development of the form. Patton (2018) states that the interview form guides the researcher and lists the intricacies of form development. First, a draft of the interview form was created; necessary revisions were made after obtaining the opinions of three experts. The form was then piloted. As a result of the piloting, it was determined that the interview questions collected data suitable for the purpose of the research. As a result, the interview form contained three questions and probes that asked about the participants' experiences during the earthquake, the solutions they developed to cope with the difficulties that arose after the earthquake, and their suggestions for reducing the problems they encountered after the earthquake and normalizing education.

### Data Collection and Analysis

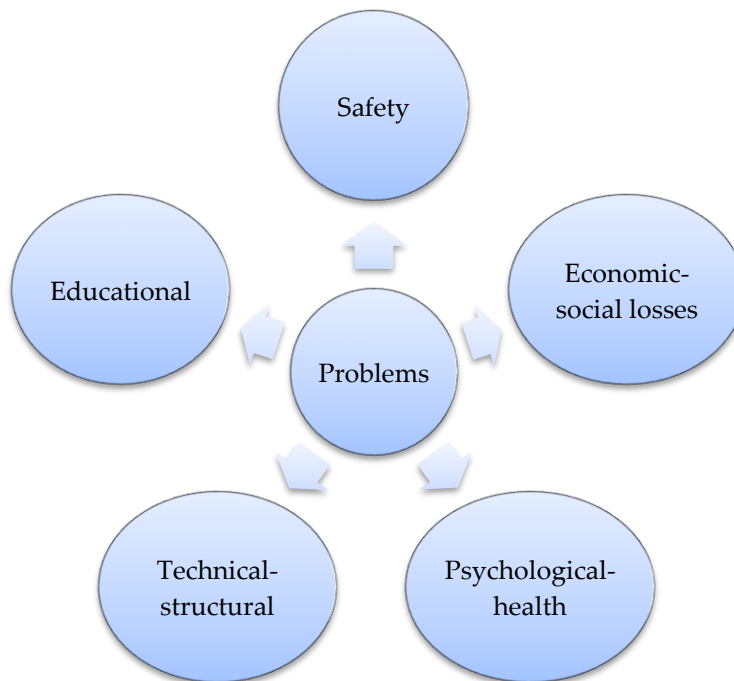
The data required for the research was collected through in-person and face-to-face interviews. First, ethical and other approvals necessary for the study were obtained from the authorities. Then, preliminary interviews were conducted with individual teachers by visiting the region and informing them about the research. Interviews were conducted with those who volunteered to participate in the research, whenever and wherever they wanted. On average, the interviews lasted 4-50 minutes.

After all the interviews were completed, the collected data was transferred to the computer environment and written down. Content analysis, as suggested by Miles and Huberman (2021), was used to analyze the data obtained. First, codes-categories and themes were created for each problem; then the results were interpreted. The data were analyzed separately by two researchers. In addition, to ensure validity and reliability, as suggested by Creswell and Miller (2000), the codes-categories and themes created separately by the researchers were compared with each other and with the results obtained by two different scholars. According to Yin (2011), any quotation or excerpt used should support the interpretations and explanations presented. Thus, as Brown (2010) and Eldh et al. (2020) point out, presenting authentic quotations of what informants have said has become the "gold standard" in qualitative studies. Thus, in order to increase the reliability and credibility of the research, some of the data obtained during the interview was presented in the text with direct quotations. Besides, the participants were given code names in the form of T1, T2, ..., T9.

## Findings

### Problems Experienced by Teachers in Provinces Affected by the Earthquake

Data analysis revealed that the problems experienced by the participants appeared in five dimensions: Safety, economic-social losses, psychological-health, technical-structural, and educational (Figure 1).



**Figure 1.** Problems experienced by teachers

As Figure 1 shows, in the security subcategory, participants reported that the number of foreign national groups in the region increased after the earthquake and that they experienced theft and looting. Some of the participants' opinions on this issue are as follows:

*We needed a lot of food and supplies. But the markets were being looted and we could not meet our needs (T3).*

*We left our house like that, never to enter it again, but this time we had a security problem. Incidents of theft and looting began. Since we could not enter the damaged houses, groups from outside began to steal valuables or things that could be converted into money (T6).*

*There was a lot of looting and stealing. People bought extra items just in case they couldn't find them. Products that were not needed were also looted by others, namely foreigners. After the earthquake, we*



*encountered many dangerous people, including refugees, foreigners, and people from outside the province. In fact, it was these people who were looting and stealing (T7).*

In the subcategory of economic and social losses, participants indicated that basic needs cannot be met and there is a need for shelter; there has been a loss of life and property; there is a loss of purchasing power due to price increases; relief and debris removal efforts have been slowed due to a lack of earthquake preparedness and prevention work; the earthquake has been forgotten by the public; there have been irregularities in financial aid and damage assessment studies; there is social pressure and ostracism toward the region; and finally, some groups advertise and show off during relief efforts. Some of the participants' opinions on this issue are as follows:

*In particular, we tried to meet our basic needs such as toilets and bathrooms outside (T2).*

*We had a lot of problems with shelter, especially during the earthquake. Tents could not be delivered to us in the first few days. The containers came much later. And the containers were not given to everyone (T2).*

*We lost some of our relatives and teacher friends; some of our colleagues' spouses and some of their children died (T1).*

*Our house was badly damaged and completely destroyed by the second earthquake in the afternoon. We bought our house with a loan, but we are still in debt. We are both homeless and in debt. At the same time, we are struggling to make ends meet (T5).*

*We lost some of our students. Or our current students have lost family members. Even if your home is moderately damaged, most of your belongings are unusable. Currently, most teachers are in financial need of both a house and furniture (T3).*

*Since the area affected by the earthquake is very large and its destructive power is very high, the rental prices of solid buildings have increased significantly, even more than our salary (T8).*

*After the earthquake, I had a hard time making ends meet. When the schools were closed due to the earthquake, I received all my tuition, but without my family's vineyard house, I have no place to stay and I cannot afford to rent a house on my own (T6).*

*This earthquake literally said it was coming. But we had not taken any precautions, either nationally or individually. We were caught off guard, and all the drills were weak. The rescue teams were not ready because there was no preparation (T3).*

*With the elections, the pain of the earthquake was quickly forgotten and the agenda in our country immediately changed. Although more than three months have passed since the earthquake, there is still debris that has not been removed, the process of debris removal has slowed, and aid has decreased (T3).*

*There have been changes in damage assessment reports to qualify for assistance. We have seen situations where moderate damage was changed to major damage and minor damage was changed to moderate damage. (T6).*

*After the election, we as a region came under social pressure. Generalizations were made about the region, we were lynched. Our electoral choices were questioned by society and we were humiliated. These inevitably spread and are seen on social media. As locals, we were very disturbed by this issue (T8).*

*We heard from families and students who had migrated and returned that they were treated as refugees in some places outside the province, that they were ostracized, and that this situation worsened after the election, and that they later decided to return. In addition, during the earthquake, some people (especially influencers) sought publicity. While they were not actively working in the field, they posted as if they were. When you checked two days later, they were gone (T9).*

In the mental health subcategory, participants reported experiencing fear, anxiety, panic, behavioral disorders, and psychological trauma after the earthquake, as well as experiencing hygiene and health problems after the earthquake. Some of the participants' opinions on this issue are as follows:

*Fear and panic surrounded us. When we went out, we heard screams and cries for help everywhere. Because of the fear and panic, various diseases started among the children. For example, some of our students cannot speak like they used to (T3).*

*We also have friends whose houses are intact, but they have not been able to enter their houses for months because of fear (T7).*

*After the schools opened, neither we nor the students could fully adjust. Because our endurance in the face of losses had diminished. Psychologically, I am not in the good mood I was before (T2).*

*Container cities were set up, but electricity and water were not provided at first. This led to hygiene problems. We go to the toilet, we cannot wash our hands, we cannot take a shower (T5).*

*The polyclinics were closed for treatment. Either we couldn't find a desk or we couldn't reach the doctors (T9).*

In the technical-structural subcategory, participants noted that electricity and communications were cut off during the earthquake; there was a need for fuel oil and generators; search and rescue teams and aid were delayed; there was a lack of organization and coordination; there were misdirections and wasted time in rescue efforts due to lack of expertise and technical knowledge; there was chaos in the region due to transportation and traffic congestion; emergency assembly areas were inadequate; and drills were inadequate in practice. Participants also stated that incompetence and irregularities were committed in structural transactions for profit and gain; local units were given authority over earthquake preparedness and construction. Some participants' opinions on this issue are as follows:

*There was a lot of lack of technical knowledge and misdirection. Because of the panic, rescue operations were delayed. Since our people were unable to give correct information due to panic and psychology, the work of existing authorized or expert people was also hindered. A lot of time was lost and the emergency response was too late (T2).*

*The rescue teams arrived too late. Although sounds were heard from the wreckage, no intervention could be made because there was no equipment. After the earthquake, we experienced both cold and frost (T8).*

*We lack activities such as drills, first aid and awareness. Exercises and first aid activities are carried out all over Turkey, but they require a lot of technical knowledge and expertise. It is difficult to put the learned information into practice (T7).*

*AFAD's lack of organization and coordination in terms of aid distribution and emergency response was serious. Even the distribution of tents was not fully completed (T3).*

*The biggest mistake made; all earthquake related work should be left to the local authorities and authorized. Irregularity and incompetence are at the highest level. Construction companies chase profit. Complaints about illegal construction, floor additions, column cutting, etc. are not taken into consideration. Building inspection, laws and regulations remain on paper (T9).*

In the subcategory of education, participants noted that the number of students in schools has decreased; that there is a need for teachers after migration; that there is absenteeism, apathy, low expectations, motivation, and hopelessness among students after the earthquake; that there are educational losses and deficiencies; that there are different practices in earthquake compensation for permanent and paid teachers; that volunteer teachers coming to the region could not be coordinated; and that there is turnover among

teachers. Participants also noted that the right of teachers to interprovincial appointments is subject to strict conditions and that appointments due to health disabilities are irregular. Some participants' opinions on this issue are as follows:

*While the earthquake compensation started to be paid to the permanent teachers, the paid teachers were excluded from the scope (T6).*

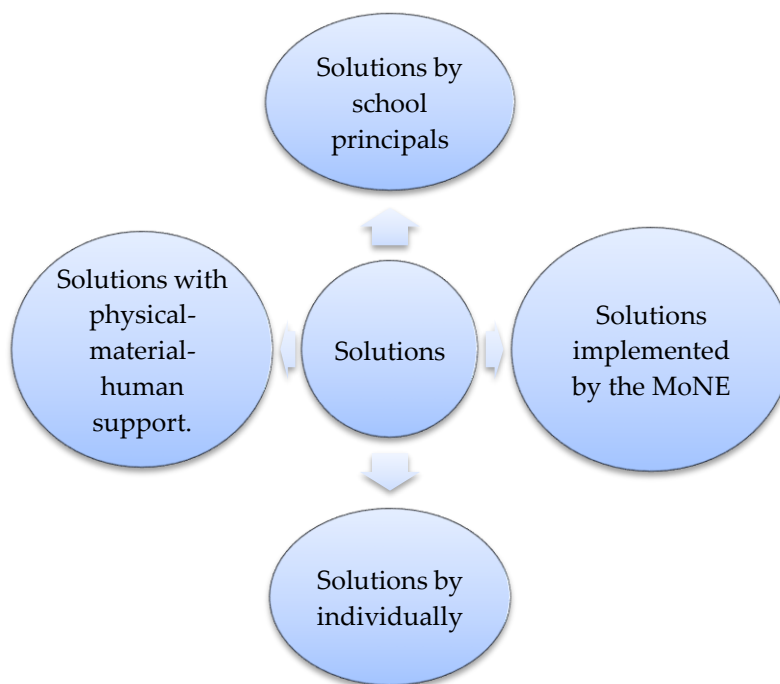
*There were those who irregularly received reports or documents regarding out-of-province appointments due to health disability, such as polyclinic, department to be treated, doctor, etc., and somehow gained the right to be appointed. There is a department, but there is no doctor, how do you get documents or reports? This is thought-provoking (T8).*

*Appointments and leave rights were left to the permission and order of the provinces. That's why there were differences in implementation between provinces and we experienced victimization (T9).*

*We also experienced difficulties in coordinating volunteer teachers. Since the branches of the incoming students were not known in advance and there was a lack of information on this subject, the primary school and branch teachers were guided in a mixed manner. Planning could not be done in the schools and programs because of the circulation (T7).*

### Solutions Developed by Teachers to Solve Their Problems

Data analysis revealed that the solutions developed by the participants appeared in four dimensions: Solutions implemented by the school principals, solutions implemented by the Ministry of National Education (MoNE), solutions implemented individually, and solutions with physical-material-human support (Figure 2).



**Figure 2.** Solutions of the participants

In the subcategory of solutions implemented by the school administration, participants expressed that teachers were given flexibility and understanding in the process by the school administration; coordination was ensured between students and teachers regarding the provision of assistance, programs and lessons; courses were given to address educational losses; rehabilitation and improvement works were carried out in schools; and they supported each other. Some participants' opinions on this issue are as follows:

*Together with our teachers who survived the earthquake, we helped the search and rescue teams and tried to reach our students and friends through the WhatsApp groups we created. We offered help by sharing shelter, food or other needs (T1).*

*We constantly organized activities for our students at school to bring them back to normal, improve their morale, motivate them, make them laugh and cheer them up. After the rehabilitation and improvement studies, we started to gradually move on to the course subjects (T2).*

In the solutions implemented by the MoNE subcategory the participants stated that education continued and normalcy was achieved; shelter schools were opened; teachers were given leave, extra course pay and the right to be assigned outside the province; students were given the right to transfer to other provinces; attendance requirements were abolished; mobile education was provided in tent cities and branches were merged and dual education was provided in fixed schools the AKUB unit affiliated to the MoNE participated in search and rescue activities; psychological counselors and volunteer teachers were assigned; and coordination between the MoNE and its sub-units was established and mobilized. Some participants' opinions on this issue are as follows:

*Children living in tent cities or tents were included in the transportation education and an attempt was made to ensure their access to education (T9).*

*Our schools were first opened for public use to meet the need for shelter, and then education began. It was very good for us and for the children to open schools to change their environment and improve their psychological conditions (T1).*

*I can say that MEB, provincial national education directorates, schools and teachers are better organized than AFAD. While vocational schools produce food and bread, public education centers produce body bags, tents, shrouds, etc. They did everything they could. Kitchens were set up and even our friends worked there (T5).*

In the subcategory of individually applied solutions, participants reported that teachers voluntarily participated in search and rescue and relief organizations, stayed in cars, parks, vineyard houses, with relatives, in different provinces for shelter purposes, or continued to live in houses with low/medium damage, and teachers continued to live in schools with low/medium damage. They also stated that the planning and programming processes were carried out and that people acted with commitment. Some participants' opinions on this issue are as follows:

*Even though it was voluntary, every teacher who saved his family ran to the field and did his best (T5).*

*Most government offices and school buildings were not badly damaged in this earthquake. That's why families can send their children to school safely (T1).*

*After the earthquake, we saw that the school buildings were stronger than our houses. At this point, children and families have full confidence in the school (T6).*

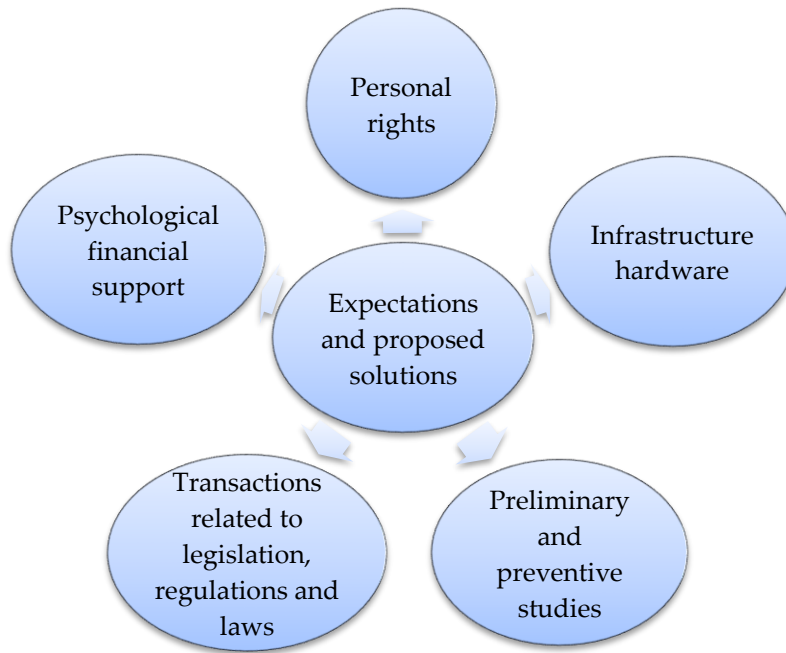
In the physical-material-humanitarian subcategory, respondents indicated that per-household financial assistance was provided to teachers affected by the earthquake, damage assessment studies were conducted, tent and container cities were set up, and volunteer assistance was provided by the public. Some participants' opinions on this issue are as follows:

*We survived this earthquake thanks to the strong solidarity and volunteer work of the Turkish people (T3).*

*Education was provided in tent cities set up throughout the province. Various courses were opened for adults in the framework of lifelong learning (T4).*

## Expectations and Proposed Solutions

Data analysis revealed that the expectations and proposed solutions developed by the participants appeared in five dimensions: Personal rights, infrastructure hardware, preliminary and preventive studies, transactions related to legislation, regulations and laws, and psychological - financial support (Figure 3).



**Figure 3.** Expectations and proposed solutions developed by the participants

Participants in the personnel rights subcategory; they emphasize that all teachers should be given the right of appointment and that teacher appointments should be planned according to need. One of the participants, T9, summarizes his views as follows:

*In teacher planning, the teachers concerned in the region should first be given the right to be appointed and new appointments should be made for the vacant positions (T9).*

Participants in the infrastructure-hardware subcategory suggested that the construction of damaged schools should be completed, school infrastructure should be improved, dual education should be abolished, zoning peace should be abolished throughout the region, soil surveys should be conducted, and multi-story buildings should not be allowed. In addition, it is expressed that education in building-related fields such as engineering and architecture can be given in selected universities, and earthquake-related courses can be taught in schools. One of the participants, T2, explains his views as follows:

*Earthquake strengthening works will be carried out for each school. In this regard, mobilization should be carried out for earthquake zones and risk areas, and urgent measures should be taken. If necessary, cooperation should be established with other ministries and institutions, and support should be obtained for equipment, materials, and experts in this regard (T2).*

Participants in the preparedness and prevention subcategory recommended increasing the number of emergency shelters and storage areas, with priority given to regions at high risk of earthquakes; developing earthquake-related early warning systems; and increasing the number of emergency response teams and equipment. It also emphasizes the need to conduct earthquake awareness activities, to keep earthquakes on the public agenda so that they are not forgotten, and to conduct and sustain earthquake drills. Another striking finding is the hopelessness and low expectation of change regarding earthquake preparedness and prevention. One of the participants, T2, explains his views as follows:

*If you look at the time between 1999 and 2023, you cannot see any change or difference. Also, the loss of life is higher. Here you can see the lack of precautions and preparations. In another earthquake that may happen after tomorrow, we will be talking about the same things again, maybe there will be more victims (T2).*

Participants in the subcategory of legislation-regulation and law-related transactions recommended the imposition of criminal sanctions for irregularities related to construction, strict supervision of authorized institutions and municipalities related to construction, enforcement of merit by strengthening earthquake-related laws, legislation and regulations, and the establishment of a centralized system compared to the authority in local units related to construction. Participants T4 and T5 explain their opinions as follows:

*Heavy criminal penalties should be applied for irregularities. Municipal supervision should be strengthened (T4).*

*Procedures such as building construction, building inspection, engineering, geotechnical surveying, and the permits to be obtained in these matters should not be left to local, i.e. municipal, units. This should be done by establishing a central system, enacting laws and imposing obligations (T5).*

In the psychological-financial support subcategory, participants emphasized the sustainability of financial support by meeting teachers' housing needs, providing psychological support, providing financial incentives by improving their purchasing power, cooperation between security-related institutions, and cooperation with other provincial national education directorates for organizing and coordinating volunteer teachers. Participants T5 and T8 explain their opinions as follows:

*Teachers in particular should be given urgent support in terms of shelter after the earthquake. Unfortunately, the one-time financial support per household was not enough. This aid must be continued until normalcy returns. Earthquake compensation must be paid (T5).*

*The Ministry of Education should not make its teachers dependent on anyone for housing, protect them from rent increases and exorbitant prices, or increase the number of structures such as dormitories and teacher TOKIs. Incentives should be provided to solve the livelihood problems of teachers in earthquake zones (T8).*

### **Conclusion, Discussion and Suggestions**

This paper aimed to investigate the experiences of teachers in the region after the Kahramanmaraş earthquake. The results showed that participants were unable to meet their basic needs and experienced security problems due to theft and looting after the earthquake. This finding of the research is consistent with the literature. According to the studies (Paudel & Ryu, 2018; Barsky, Trainor & Torres, 2006; Frailing & Harper, 2017), it was found that the rate of looting and crime increased during and after the earthquake, attempts were made to take valuable items, especially from damaged buildings, and various foreign groups increased in the earthquake provinces, and the aid provided by institutions and individuals was misdirected by taking them under the title of earthquake victims. This study showed that teachers experience the same problems as earthquake victims and that looting and theft are important social problems experienced during the earthquake. Faced with the devastating effects of the earthquake, both teachers and earthquake victims need the protective hand of official institutions and the healing of wounds through sacrifice. The efficient and planned use of available resources can alleviate the pain and strengthen the sense of commitment.

The results revealed that there was a housing problem; loss of life and property; loss of purchasing power with price increases; lack of earthquake preparedness and prevention work slowed relief and debris removal efforts; the earthquake was forgotten by being removed from the public agenda; irregularities in financial aid and damage assessment studies; social pressure on the region and exclusion occur; and some

groups advertise and show off during relief efforts in the region after the earthquake. The analysis of the data showed that due to the widespread destruction caused by the earthquake, the need for housing, which is one of the main problems, together with the rent increases made as a result of opportunism, created a great victimization.

According to the findings, the country's lack of preparedness for the earthquake caused insurmountable problems after the earthquake, resulting in the reality of the earthquake being forgotten. At the same time, the loss of life, property and economic losses forced the earthquake-affected teachers to migrate, resulting in social and psychological problems related to migration. In fact, the results revealed that earthquake victims, both in the earthquake zone and in areas outside the earthquake provinces, experience social adjustment problems such as loneliness, alienation, and exclusion. These problems affect teachers psychologically, sociologically, and individually.

According to the findings, in addition to irregularities in aid distribution and damage assessment studies, it was emphasized that due to the social impact of social media, some groups and phenomena made advertisements and ostentations about aid distribution. In general, it can be seen that social media not only play a savior role in times of crisis and chaos, such as collecting aid, organizing or increasing the efficiency of transportation access, but also spread information pollution by including reliable, accurate and unofficial exchanges. Biased posts and misinformation by some people or groups on social media who tried to turn the earthquake into an opportunity exploited the feelings of teachers in the region as well as the earthquake victims.

According to the findings, the fear, panic, and loss of life after the earthquake negatively affected the mental health and psychological resilience of the participants, increasing their anxiety and stress levels. In studies conducted on earthquakes and natural disasters (Zhang, Zhang, Zhu, Du, & Zhang 2015; Sinclair, 2002), post-traumatic stress disorder has been observed in individuals due to earthquakes. The reluctance of teachers to even enter solid structures reinforces this finding. According to data analysis, sanitation problems in tent cities and containers led to the risk of epidemics and disruption of health services.

The findings showed that there is a lack of technical knowledge, infrastructure, coordination and preparedness for earthquakes; that effective policies on earthquakes could not be implemented in the country; that the earthquake was not taken seriously as a disaster by institutions and individuals; that work and operations remain on paper. Participants emphasized that the delegation of authority over construction to local units has led to irregularities. Lack of supervision and low accountability or arbitrary practices have led to the emergence of rent-seeking and profiteering activities in construction. In this context, eliminating opportunism by focusing on human life in buildings and empowering central units on these issues becomes very important.

According to the findings, there were many learning losses as students in the region struggled with the aftermath of the earthquake. During the previous pandemic period in the country, schools were closed and education was provided online; after the earthquake, students in the region experienced profound negative effects such as absenteeism, apathy, low motivation, low expectations for the future, and despair about face-to-face education. It can be said that this situation creates social inequalities in terms of economic impossibilities, need for social assistance and exposure to risks in the region compared to the mass of students and teachers outside the region.

According to the findings, differences in personnel rights between provinces in the earthquake zone also affected teachers. The strict conditions imposed on out-of-province assignments immediately after the earthquake made it difficult for participants to solve many problems, especially housing. In addition, the volunteer teachers sent to the region had a partial negative impact on the normalization of education due to

the lack of direction and guidance, plan and program in the activities carried out. According to the results, in schools, teachers' schedules were made more flexible in order to prevent learning losses; various courses were opened. In this way, improvement efforts were made to help students in difficult situations. It is essential for the sustainability of education that teachers stay together in this process and support the normalization efforts in education and provide personal, psychological, material and moral support to students during the post-earthquake rehabilitation process. For this reason, supporting teachers, who play a key role in the normalization process of education, ensuring that they do not feel helpless and alone, and drawing strength from mutual solidarity and cooperation contributes to the healing of education. In fact, the literature (Bonanno, Brewin, Kaniasty & Greca, 2010) states that the first support for survivors after the earthquake is the social solidarity that comes from their closest relatives and the environment.

According to the findings, the general solutions implemented by the Ministry of Education are: It improved the personal rights of teachers and all individuals who were earthquake victims during the normalization process were able to benefit from all the facilities of schools. Efforts were made to ensure the participation of students in the educational process through the establishment of tent / container cities and mobile education. Data analysis showed that the Ministry of National Education and the Provincial Directorates of National Education are more coordinated and mobilized by involving administrators, teachers and students in the management of the organizations compared to other units. According to the results, the fact that the Ministry of Education is a large institution in terms of personnel and units, and the formation of formal institutionalization played an important role in the continuation of educational services and mitigating the effects of the earthquake. At the same time, the implementation of flexible models in education plays a critical role in terms of access to education for students affected by the earthquake (Watson, Loffredo & McKee, 2011).

According to the findings, teachers also developed individual and social solutions to create living spaces during the rehabilitation process, such as participating in search and rescue activities, continuing to live in the damaged house, and providing voluntary assistance. The solutions developed by teachers show that they play a critical role in saving lives and providing educational services during and after the earthquake (Stratta et al., 2014).

Teachers' expectations and suggestions for solutions have emerged in order to strengthen the country's infrastructure and equipment, complete the deficiencies and avoid abuses, especially those related to structural transactions. Due to the high destructive power of earthquakes, disaster education activities should be carried out for all people in society (Hoffmann & Blecha, 2020) and the prerequisite for earthquake preparedness and earthquake prevention activities should be realized.

Mental preparation through consciousness and awareness will then bring physical preparation. In this context, in order for disaster education to be sustainable and implemented during the earthquake process, training should be provided by expert and experienced individuals and should be made a part of daily life. In order to prevent the resources of public and private institutions and organizations from being insufficient in the post-earthquake period, the units that will plan and coordinate physical and human resources should be institutionalized and standardized with merit. In addition, all measures that can be taken to increase the earthquake resistance of people and societies, as well as earthquake preparedness studies, should be placed on a solid foundation within the framework of laws and regulations (Potter, Pavlakis & Roberts, 2021). According to the findings, participants suggest that the personal rights of teachers in disaster situations should be improved or relaxed. In this context, the Ministry of Education needs to protect its staff, especially in extraordinary situations, and create conditions that enable staff to maintain their commitment to the school. The most important of these conditions are meeting housing needs, providing material and moral incentives for teachers, providing psychosocial support, and increasing purchasing power.



As a result, education and teachers as key components in the normalization process of society in extraordinary situations is a strategic investment to minimize the impact of disasters and increase the effectiveness of learning. In particular, involving and protecting teachers in this process and meeting their needs will ensure that societies are resilient to disasters, recover quickly and cope with disasters in the long term. It is understood that after extraordinary events such as earthquakes, education cannot be postponed due to its role in improving society (Johnson et al., 2014). Therefore, this research highlights the fact that the normalization of education is the most important solution criterion for the normalization of society in extraordinary situations and crises.

The mental and physical resilience of teachers in the region is critical to the recovery of daily life, the return to normalcy after disasters, and the sustainability of education. The lives of teachers affected by the earthquake changed dramatically in the aftermath; the panic, fear and trauma they experienced negatively affected them physically, mentally and spiritually. The low hopes of the teachers in solving the problems that they believe cannot be changed for the future after the earthquake will cause problems in the quality of education that will shape the future of the country, as well as individual problems such as health in the future (Mir, Shah & Shafi Bhat, 2023). Therefore, providing individual, institutional and social support to these teachers should be an important agenda item of the normalization policy in the country.

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# Investigation of the Effect of Mathematical Modeling Activities on 8th Grade Students' Critical Thinking Skills\*

Research Article

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## ABSTRACT

This experimental study examined the effect of mathematical modeling activities on the critical thinking skills of 8th-grade middle school students. A pretest-posttest control group quasi-experimental design was used among the quantitative research designs. The study group consisted of 80 eighth-grade students, 40 in the experimental group and 40 in the control group. The experimental group applied mathematical modeling activities based on the socio-critical modeling approach for seven weeks, while the current mathematics curriculum was applied in the control group. The Critical Thinking Skills Test and Critical Thinking Disposition Scale were administered to both groups as a pre-test before the intervention and a post-test afterward. Data were analyzed using the Shapiro-Wilk normality test, dependent sample t-test, and independent sample t-test. The analysis revealed a significant difference between the pre-test and post-test scores of the Critical Thinking Skills Test and Critical Thinking Disposition Scale in the experimental group, favoring the post-test. In the control group, no significant difference was found between the pre-test and post-test scores of the Critical Thinking Skills Test and Critical Thinking Disposition Scale. The results of the study indicated that mathematical modeling activities improved the critical thinking skills and dispositions of 8th-grade middle school students.

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### Keywords:

Critical thinking disposition, Critical thinking skills, Mathematical modeling, Mathematics education, Socio-critical modeling perspective

## Introduction

Improving critical thinking skills is vital for students to meet twenty-first-century competencies (Greiff & Kyllonen, 2016; McGunagle & Zizka, 2020). Critical thinking skill is essential for success in all areas of life.

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Therefore, it is crucial to incorporate critical thinking skills into curricula, especially within mathematics courses (Chukwuyenum, 2013). Like other skills, critical thinking skills can be learned, taught, and developed through appropriate learning environments (Jackson, 2000). Mathematics is a key area where students can effectively acquire critical thinking skills through suitable learning activities (Ansoy & Aybek, 2021). It is vital for students to encounter real-life problems that engage their critical thinking skills in mathematics lessons. Mathematical modeling activities enable students to apply their mathematical knowledge and skills to real-life situations (Maaß, 2005). These activities require students to activate their cognitive abilities and thinking skills while solving real-life problems, thus contributing to the development of higher-order thinking skills (Blum & Borromeo-Ferri, 2009).

Critical thinking skills enable students to evaluate, analyze and reason about real-life problems (Changwong et al., 2018; Rizki, I., Suprapt, 2024). These skills are critical for individuals to be successful both in their educational and professional lives. Thus, enabling individuals to approach situations from a critical perspective is among the objectives of educational curricula. However, various studies worldwide indicate that individuals' critical thinking skills are at low levels. For instance, the 2020 report by the Reboot Foundation revealed that critical thinking skills are inadequate, negatively affecting the ability to critically evaluate information in the digital information age (Reboot Foundation, 2020). The Brookings Institution also emphasizes that educational systems need to better prepare individuals for the complex problem-solving and critical thinking demands of modern society. Similarly, scholars in the field of critical pedagogy report that current education systems do not foster critical thinking and instead undermine individuals' critical thinking abilities. Therefore, it is essential to clearly identify practices that have been proven to enhance critical thinking skills and can be implemented within existing educational systems.

Research indicates that mathematics education can significantly enhance students' critical thinking skills by presenting activities based on real-life problems. Globally, mathematics curricula prioritize problems that involve real-life situations. However, when examining mathematical literacy aimed at solving real-life situations, it is observed that the levels of this literacy are low in some countries (PISA, 2022). The PISA results show that the level of mathematical literacy in Turkey is not at the desired level. Similarly, it is known that students' critical thinking skills are not at the expected level. In this context, although it is claimed that real-life problems increase critical thinking skills, it must be clearly demonstrated how these activities can be organized in a way that is suitable for a specific culture and everyday life context and how much these activities can impact critical thinking skills. Therefore, there is an urgent need for experimental studies aimed at developing critical thinking skills.

However, there are not enough experimental studies to support this claim, and the best practices for developing critical thinking skills are not clearly defined. This study explains how model-building activities, believed to improve critical thinking skills, were structured and experimentally examines their effect on critical thinking. Suggestions are made based on the findings.

## **Critical Thinking Skills**

The concept of critical thinking has been defined in various ways by different disciplines such as education, philosophy, and psychology. Consequently, there is no single agreed-upon definition. For instance, Ennis (1993) defines critical thinking as a reflective system focused on deciding what to do or believe. Halpern (1997) defines it as the ability to use cognitive abilities and the right strategies in the right way to increase the likelihood of achieving desired results. Sternberg (1999) defines it as a system of reflective thinking, while Paul and Elder (2016) define it as analyzing and evaluating one's own thinking to develop thinking. Nosich (2018) defines it as questioning, examining, and solving problems on a logical basis.

Although these definitions have common aspects, they differ at certain points. In 1987, the Delphi Project was organized by the American Philosophical Association under the chairmanship of Facione to unify the definitions of critical thinking on common ground and create an interdisciplinary definition. The researchers involved in the Delphi Project defined critical thinking as: “We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based” (Facione, 1990). The Delphi Project also clarified the skills included in critical thinking. Experts agreed that critical thinking involves six cognitive skills: explanation, analysis, interpretation, inference, evaluation, and self-regulation (Facione, 1990).

Examining the sub-skills of critical thinking reveals that they consist of skills needed to solve daily life problems. For instance, to reach the right solution in real-life problem-solving, one must first understand the problem, interpret it according to the real situation, analyze the circumstances, and make inferences and evaluations to reach a logical conclusion. Thus, critical thinking includes the essential skills needed to solve everyday problems.

Given the importance of these skills, it is necessary to discuss the concept of critical thinking disposition. Critical thinking disposition refers to individuals' willingness and inclination to use and develop these cognitive skills. This disposition enables individuals to be more effective in solving problems, accessing information, and evaluating it. In this context, it is crucial to examine in detail what critical thinking disposition means and how we can foster this disposition.

### **Critical Thinking Tendency**

It is insufficient for individuals to merely possess critical thinking skills; it is crucial for them to apply these skills in their daily lives when necessary (Holma, 2015). Research indicates that individuals with both critical thinking skills and a critical thinking disposition can effectively use critical thinking in their daily lives (Emir, 2012). Therefore, it is essential to acquire critical thinking skills and cultivate a tendency to use them (Halpern, 1998).

A tendency towards critical thinking results in observable and measurable changes in individuals' behaviors. These behaviors were discussed in the Delphi project, which also identified the characteristics of individuals with critical thinking tendencies. According to the project, individuals with critical thinking tendencies are logical, open-minded, willing to think, curious, fair, objective in evaluation, focused on questioning, reasonable in determining criteria, organized in complex issues, diligent in seeking new information, courageous in confronting personal prejudices, and flexible when necessary (Facione, 2011).

Mathematical modeling activities are believed to contribute to the development of both critical thinking skills and critical thinking disposition in students. During mathematical modeling activities, students must accurately identify the problem, generate solutions for real-life situations, conduct research, understand different ideas, choose information bases correctly, evaluate solutions objectively, and cope with difficulties in the solution process. These activities demonstrate that mathematical modeling can effectively develop critical thinking disposition.

In mathematics education, certain practices that require high-level thinking skills (analysis, synthesis, evaluation) and facilitate these processes are known to promote both critical thinking disposition and skills (Kurniati, Kusumah, Sabandar & Herman, 2015). These practices typically involve accurately defining the problem, identifying relevant data for the solution, generating multiple solutions, and evaluating these solutions (Monteleone, Miller & Warren, 2023). Due to these characteristics, mathematical modeling is also considered to contribute to critical thinking skills.

## **Mathematical Modeling**

Mathematical modeling involves mathematically interpreting and explaining real-life problems and expressing them through various mathematical representations (Blum, 2002; Barbosa, 2003; Lesh & Doerr, 2003; Blum & Borromeo-Ferri, 2009). In other words, mathematical modeling is a complex process where real-life situations, events, or phenomena are expressed mathematically, revealing mathematical patterns (Verschaffel, Greer & De Corta, 2002). This dynamic process helps us easily see relationships in real-life problems, express them mathematically, draw conclusions, and make generalizations (Fox, 2006).

Different modeling processes have emerged from various approaches in the literature. For instance, Lesh and Doerr (2003) view the mathematical modeling process as cyclical, involving transitions between the real and model worlds. Voskoglou's (2006) process includes five stages: analyzing the problem, mathematizing, solving the model, verifying the model, and interpreting the results. Blum and Leiß's (2007) process comprises seven steps: real situation, situation model, real model, mathematical model, mathematical results, and real results.

Components like the purpose of mathematical modeling, approaches to the modeling process, and the nature of mathematical modeling tasks have led to various perspectives on mathematical modeling (Abassian, Safi, Bush & Bostic, 2020). Researchers such as Berry and Houston (1995), Kaiser and Sriraman (2006), and Blomhøj (2009) have classified these perspectives to enhance understanding and highlight their similarities and differences. Kaiser and Sriraman (2006) categorized mathematical modeling approaches into six types: realistic or applied modeling, contextual modeling, educational modeling, socio-critical modeling, epistemological or theoretical modeling, and cognitive modeling. Since this study's activities were developed within the socio-critical modeling perspective, only this perspective is discussed.

### **Socio-Critical Modeling Perspective**

The socio-critical modeling approach emphasizes the social and cultural dimensions of mathematics. This perspective focuses on the social role of mathematics and advocates for fostering students' critical thinking about the role and function of mathematics in society (Kaiser & Sriraman, 2006). It asserts that students should use mathematics to critically examine the society and cultural structures in which they live.

According to the socio-critical modeling perspective, mathematical modeling activities should be derived from real-life situations with a critical element and enriched through organized student discussions (Barbosa, 2006). Through these activities, students should be encouraged to approach real-life problems—whether social, economic, cultural, or societal—from a critical perspective. Mathematical modeling activities framed within the socio-critical perspective must meet certain criteria to achieve this. Some of these criteria include (Barbosa, 2006; Kaiser & Sriraman, 2006):

- **Relevance:** Activities should be based on real-life situations and be meaningful to students, addressing issues that concern them, their families, friends, or their community.
- **Collaboration:** Activities should encourage collaborative work, fostering the emergence of diverse ideas and perspectives.
- **Critical Evaluation:** Activities should prompt students to question and critically evaluate the accuracy of their conclusions.
- **Social Awareness:** Activities should address social inequalities, encouraging students to use their mathematical knowledge and skills to critically assess fairness.



## **Purpose of the Study**

It is well known that critical thinking is not an innate trait but a skill that can be developed through a systematic instructional process (Fisher, 2011; Paul & Elder, 2016). Lipman (1988) argues that critical thinking skills are teachable and essential for developing students' logical and analytical abilities. Therefore, there is a need for systematically implementable materials to develop critical thinking skills. This study examined the effect of a mathematics course incorporating mathematical modeling activities on students' critical thinking skills. For this purpose, mathematical modeling activities were prepared within the framework of the socio-critical modeling perspective. Students were expected to use their mathematical knowledge and skills to solve real-life problems through these activities. Thus, the impact of modeling activities on critical thinking skills will be concretely demonstrated.

When examining mathematical modeling processes, it is evident that, despite some differences, they generally consist of similar steps. Skills such as understanding, interpreting, constructing, mathematizing, making assumptions, verifying, and evaluating in mathematical modeling processes align with the sub-skills of critical thinking. Facione (1990) lists the sub-dimensions of critical thinking as explanation, interpretation, inference, analysis, self-regulation, and evaluation. Borromeo-Ferri (2006) examined the cognitive skills in the mathematical modeling process in six steps: understanding the problem, simplifying the problem, mathematizing, working mathematically, interpreting, and verifying. In the problem comprehension step, students make sense of the given real-life situation and create a simple representation in their minds, relating to the explanation and interpretation sub-skills of critical thinking. In the simplification step, students distinguish the necessary information to solve the problem and use additional mathematical knowledge when needed, based on their life experiences, relating to the interpretation and analysis sub-skills of critical thinking. In the mathematization step, students express their thoughts and assumptions about the problem solution with mathematical expressions, relating to the inference-making sub-skill of critical thinking. In the mathematical working step, students work on their created model to solve the problem using their mathematical knowledge and skills, also relating to the inference-making sub-skill of critical thinking. In the interpretation step, students check if their results are consistent with real life, relating to the evaluation sub-skill of critical thinking. In the verification step, students check their results both mathematically and in real life contexts, relating to the evaluation and self-regulation sub-skills of critical thinking. Based on these processes, the potential of mathematical modeling activities in developing critical thinking is theoretically recognized in the literature (Kaiser and Sriraman, 2006; Barbosa, 2006; Blum and Borromeo-Ferri, 2009). However, the lack of experimental studies in this area is noteworthy. This highlights the need for further research to understand how and to what extent modeling activities enhance critical thinking skills.

Developing critical thinking skills not only enhances students' academic success but also equips them with more effective problem-solving and decision-making abilities in their daily lives. This research will contribute to students' overall cognitive and academic development by demonstrating how they can improve their critical thinking skills. Furthermore, this study will serve as a foundation for future research examining the relationship between modeling activities and critical thinking skills. While emphasizing the necessity for further studies in this area, the findings of this research will also facilitate the development of new research questions and hypotheses.

Therefore, this study is unique in revealing the effect of mathematical modeling activities on students' critical thinking skills.

## **Research Questions**

1. How do mathematical modelling activities affect 8th grade students' critical thinking skills?

Hypothesis 1:

$H_0$  = There is no significant difference between the pre-implementation critical thinking skills test scores of the experimental and control groups.

Hypothesis 2:

$H_0$  = There is no significant difference between the pre-test and post-test critical thinking skills test scores of the experimental group.

Hypothesis 3:

$H_0$  = There is no significant difference between the pre-test and post-test critical thinking skills test scores of the control group.

Hypothesis 4:

$H_0$  = There is no significant difference between the post-test critical thinking skills test scores of the experimental and control groups.

2. How do mathematical modelling activities affect 8th grade students' critical thinking dispositions?

Hypothesis 1:

$H_0$  = There is no significant difference between the pre-implementation critical thinking disposition scale scores of the experimental and control groups.

Hypothesis 2:

$H_0$  = There is no significant difference between the pretest and posttest critical thinking disposition scale scores of the experimental group.

Hypothesis 3:

$H_0$  = There is no significant difference between the pretest and posttest critical thinking disposition scale scores of the control group.

Hypothesis 4:

$H_0$  = There is no significant difference between the post-test critical thinking disposition scale scores of the experimental and control groups.

### **Method**

This study utilized a quasi-experimental design with a pretest-posttest control group, a common quantitative research approach. The aim of experimental designs is to examine the effect of an experimental procedure on the outcome by controlling external factors that may influence the study's results as much as possible (Cresswell & Cresswell, 2017).

Two 8th-grade classes in the school where the study was conducted were matched based on certain variables (e.g., achievement, number of students) and then randomly assigned to the experimental and control groups. The experimental group implemented mathematical modelling activities for seven weeks, considering the socio-critical modeling perspective. In the control group, lessons continued according to the current mathematics curriculum. The researcher conducted the studies in both groups to minimise the effect of uncontrollable variables. The implementation design of the study is shown in Table 1.

**Table 1.** Implementation design used in the study

Groups	Before Experiment (Pre-Test)	Experimental Procedure	After Experiment (Post Test)
Experimental Group	Critical Thinking Skill Test (CTST) Critical Thinking Tendency Scale (CTTS)	Teaching with mathematical modeling activities	Critical Thinking Skill Test (CTST) Critical Thinking Tendency Scale (CTTS)
Control Group	Critical Thinking Skill Test (CTST) Critical Thinking Tendency Scale (CTTS)	Teaching in line with the current curriculum	Critical Thinking Skill Test (CTST) Critical Thinking Tendency Scale (CTTS)

### Universe and Sampling

This study was conducted with 8th-grade students attending a public secondary school in Istanbul during the 2022-2023 academic year. The distribution of the students participating in the study is shown in Table 2.

**Table 2.** Sample of the study

Groups	Female	Male	Total
Experimental Group	19	21	40
Control Group	20	20	40

The "convenient sampling method," a non-random sampling method, was preferred to determine the study sample. In this method, the researcher selects the most accessible and practical situation to gain speed and efficiency in the study, including individuals who can provide data quickly and economically (Yıldırım & Şimşek, 2021). Consequently, the research was conducted at the secondary school where the researcher worked.

This study was conducted with permission from Yıldız Technical University, Social Sciences and Humanities Research Ethics Committee. (27.12.2022 / 2022.12)

### Data Collection Instruments

Critical Thinking Skills Test (CTST) and Critical Thinking Tendency Scale (CTTS) were used to collect the data of the study.

#### Critical Thinking Skills Test (CTST)

To examine the effect of mathematical modeling activities on students' critical thinking skills, the "Critical Thinking Skills Test" (CTST), developed by Eğmir and Ocak (2016) based on expert opinions, was used. The KR-20 and KR-21 values were calculated as .61 and .63, respectively. The difficulty index of the entire test was .37, and the discrimination index was .32. These analyses indicated that the test had high discrimination and medium difficulty. The scale's questions included scenarios to encourage students to think and were prepared as multiple-choice tests.

#### Critical Thinking Tendency Scale (CTTS)

The Critical Thinking Disposition Scale (CTTS) was developed by Yıldırım-Döner and Demir (2022) to measure the critical thinking tendencies of middle school students in grades 5 through 8 (ages 9-14). The reliability analysis conducted during the development of the scale yielded a Cronbach's Alpha value of .87, Spearman-Brown and Guttman Split-Half values of .81, and an internal consistency coefficient of .75. These values indicate that the scale is quite reliable with high internal consistency. The scale, prepared in a five-point

Likert format (always, often, sometimes, rarely, never), consists of 21 items and includes three sub-dimensions: disposition, analysis, and dialectic.

### Implementation Process

The mathematical modeling activities used in this research were prepared following the socio-critical modeling perspective. Each activity begins with a social event and includes questions that require students to apply their mathematical knowledge and skills. The problems were based on current events that students may encounter in their daily lives, incorporating questions involving the sub-dimensions of critical thinking. This approach aimed to enhance students' critical thinking skills and their ability to use mathematical knowledge to solve real-life problems.

The 40 students in the experimental group were divided into 8 study groups, each consisting of 5 students. Group formation considered students' achievements in mathematics and their social skills. The application was conducted in the classroom where students received their education. The classroom was arranged to facilitate group work by making necessary physical adjustments before the application. The mathematical modeling activities for the experimental group were scheduled for three class hours per week. During the activities, groups worked on the tasks for two class hours and spent one class hour presenting their solutions and evaluating other groups' solutions.

Three of the mathematical modeling activities in the study were adapted from the mathematics education literature, while the rest were developed by the researcher in line with expert opinions.

**Table 3.** Implementation plan of the study

<i>Weeks</i>	<i>Mathematical Modeling Activities</i>
1. week	How Much Should My Allowance Be? (adapted from; Biccard, 2010)
2. week	Pulses Distribution (adapted from; Barbosa, 2006)
3. week	How Much Should We Pay?
4. week	Who will be the School Student Representative?
5. week	Who should represent our school? (adapted from; Swan, Turner, Yoon & Muller, 2007)
6. week	Traffic Accidents
7. week	How Much Should Rent Increase?

### Data Analysis

The data obtained using the Critical Thinking Skills Test (CTST) and Critical Thinking Tendency Scale (CTTS) were analyzed with SPSS. Normality tests were applied to determine the appropriate statistical methods for data analysis. Specifically, the Shapiro-Wilk normality test, skewness and kurtosis coefficients, and measures of central tendency were calculated to assess whether the data followed a normal distribution.

The Shapiro-Wilk normality test assesses whether measurement results in a data set have a normal distribution. When the sample size is below 50, it is recommended to use the Shapiro-Wilk test first to check the normality assumption (Rovai, Baker & Ponton, 2014).

The results of the analysis of whether the quantitative data obtained in the study have a normal distribution are shown below.

**Table 4.** Data on normality distributions of data collection tools

Data Collection Tools	Groups	$\bar{X}$	Sd	Skewness	Kurtosis	Shapiro-Wilk	
						Statistics	p
Critical Thinking Skill Test (Pre-Test)	Experiment	13.400	3.410	.447	-.114	.971	.396
	Control	13.875	3.376	.450	.034	.976	.559
	Experiment	62.450	6.965	-.304	-.406	.975	.511

Critical Thinking Tendency Scale (Pre-Test)	Control	62.750	7.438	-.012	-.693	.973	.452
Critical Thinking Skill Test (Post Test)	Experiment	15.950	3.412	-.241	-.820	.969	.338
	Control	14.250	2.762	.595	.024	.954	.106
Critical Thinking Tendency Scale (Post Test)	Experiment	69.025	7.350	-.677	.057	.949	.070
	Control	63.275	7.264	-.056	-.936	.954	.201

Examining the data, the significance values of the Shapiro-Wilk test, based on normal distribution, are greater than .05. According to Büyüköztürk (2020), a p-value greater than .05 in the Shapiro-Wilk test indicates that the data from the collection tools have a normal distribution. The skewness and kurtosis coefficients, which range from -1 to +1, also support the normality assumption. Although literature presents different acceptable values for skewness and kurtosis, Field (2018) states that values within the range of -1 to +1 indicate a normal distribution.

According to the results, both data collection tools' pre-test and post-test scores show a normal distribution. Therefore, dependent samples t-test and independent samples t-test, which are parametric tests, were used to analyze the data.

## Results

### Findings of the critical thinking skills test

#### Findings related to the first hypothesis

The homogeneity of variances, which is one of the conditions for the applicability of the independent samples t-test, was examined with the Leneve Test. According to the Leneve test results, it was determined as ( $F=.020$ ;  $p=.888$ ). Since the condition of  $p>.05$  was realized, the groups were homogeneous. The results of the independent samples t-test analysis of the CTST pre-test scores are shown in Table 5.

**Table 5.** Independent samples t-test results of CTST pretest scores

Groups	Test	N	$\bar{X}$	Sd	SHx	t test		
						t	df	p
Experimental Group	pre-test	40	13.40	3.410	.539	-.626	78	.533
Control Group	pre-test	40	13.88	3.376	.534			

When Table 5 was examined, it was found that there was no statistically significant difference between the mean pretest scores of the experimental and control group students before the intervention ( $t_{(78)}=-.626$ ;  $p>.05$ ).  $H_0$  hypothesis was accepted. Therefore, there is no significant difference between the critical thinking skill levels of the experimental and control group students before the application.

#### Findings related to the second hypothesis

Dependent samples t-test was used to compare the pretest and posttest CTST scores of the experimental group. The normality assumption for the dependent samples t-test is related to the sampling distribution of the differences between the scores, not the scores themselves (Field, 2018). In other words, the normality of the difference scores obtained by taking the difference of posttest and pretest scores should be examined (Can, 2024). Therefore, first of all, the normality of the pre-test and post-test difference scores for the experimental group was examined. The results of the analysis are shown in Table 6.

**Table 6.** Normality test results of experimental group pretest-posttest difference scores

Group	Test	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistics	df	p	Statistics	df	p
Experimental Group	CTST Difference Scores	.144	40	.036	.971	40	.374

When Table 6 is examined, since the number of data (Sd=40) was less than 50, the result of “Shapiro-Wilk” statistic was examined. According to the statistical results, since  $p > .05$ , the difference variable in the experimental group for CTST is normally distributed ( $p = .374$ ). Therefore, independent samples t-test was used to compare the variables.

**Table 7.** Dependent samples t-test results of CTST experimental group pre-test and post-test scores

Group	Test	N	$\bar{X}$	Sd	SHx	t test		
						T	df	p
Experimental Group	pre-test	40	13.40	3.410	.539	-5.062	39	.000
Experimental Group	post-test	40	15.95	3.412	.539			

When Table 7 is examined, it is seen that there is a statistically significant difference between the experimental group's CTST pretest and posttest mean scores ( $t_{(39)} = -5.062$ ;  $p < .05$ ).  $H_0$  hypothesis was rejected. While the mean EDCT score of the experimental group students was ( $\bar{X} = 13.40$ ) before the application, the mean CTST score increased to ( $\bar{X} = 15.95$ ) after the implementation of mathematical modeling activities. This finding shows that mathematical modeling activities have a significant effect on increasing students' critical thinking skill levels.

In the study, the Eta-square coefficient ( $\eta^2$ ) was calculated to determine the effect size of mathematical modeling activities on the total CTST scores of the experimental group students. The Eta-square coefficient shows how effective the independent variable is on the dependent variable. The Eta-square coefficient takes a value between 0 and 1 and ( $\eta^2 = 0.01-0.06$ ) is interpreted as a small effect size, ( $\eta^2 = 0.06-0.14$ ) as a medium effect size and ( $\eta^2 = 0.14$  and above) as a large effect size (Büyüköztürk, 2020). It was determined that the mathematical modeling activities applied in the experimental group had a high effect ( $\eta^2 = .39$ ) on students' critical thinking skills test scores.

**Findings related to the third hypothesis**

Dependent samples t-test was used to compare the pre-test and post-test CTST scores of the control group. For this purpose, the normality of the difference scores between both measurements in the control group was examined first.

**Table 8.** Normality test results of the control group pretest-posttest difference scores

Group	Test	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistics	df	p	Statistics	df	p
Control Group	CTST Difference Scores	.185	40	.001	.954	40	.107

When Table 8 is examined, since the number of data (Sd=40) was less than 50, the “Shapiro-Wilk” statistic result was examined. According to the statistical results, since  $p > .05$ , the difference variable in the control group for CTST is normally distributed ( $p = .107$ ). Therefore, independent samples t-test was used to compare the variables.

The results of the dependent samples t-test analysis for the comparison of the pre-test and post-test CTST scores of the control group are shown in Table 9.

**Table 9.** Dependent samples t-test results of CTST control group pretest and posttest scores

Group	Test	N	$\bar{X}$	Sd	SHx	t test		
						t	df	p
Control Group	pre-test	40	13.88	3.376	.534	-.856	39	.397
Control Group	post-test	40	14.25	2.762	.437			

When Table 9 is examined, it is seen that there is no statistically significant difference between the pre-test and post-test mean CTST scores of the control group ( $t_{(39)}=-.856$ ;  $p>.05$ ).  $H_0$  hypothesis was accepted. It was seen that there was no significant increase in the critical thinking skill levels of the control group students who were taught with the current curriculum.

#### Findings related to the fourth hypothesis

In the comparison of the post-application critical thinking skills test scores of the experimental and control groups, independent samples t-test was used since the measurements related to the dependent variable showed normal distribution in both the experimental and control groups. The homogeneity of variances, which is one of the conditions for the applicability of t-test for independent samples, was examined by Leneve Test. According to the Leneve test results, it was determined as ( $F=2.606$ ;  $p=.111$ ). Since the condition of  $p>.05$  was realized, the groups were homogeneously distributed. The results of the independent samples t-test analysis of the CTST post-test scores are shown in Table 10.

**Table 10.** Independent samples t-test results of the CTST post-test scores

Group	Test	N	$\bar{X}$	Sd	SHx	t test		
						t	df	p
Experimental Group	post-test	40	15.95	3.411	.539	2.449	78	.017
Control Group	post-test	40	14.25	2.762	.437			

When Table 10 is examined, it is seen that there is a statistically significant difference between the posttest mean scores of the experimental group and the control group ( $t_{(78)}=2.449$ ;  $p<.05$ ).  $H_0$  hypothesis was rejected. Accordingly, the critical thinking skills of the students in the experimental group, in which mathematical modeling activities were applied, increased significantly compared to the students in the control group, in which the current curriculum was applied.

#### Findings of the critical thinking tendency scale

##### Findings related to the first hypothesis

In the comparison of the pre-application critical thinking disposition scale scores of the experimental and control group students, independent samples t-test was used since the measurements related to the dependent variable showed normal distribution in both the experimental group and the control group. The homogeneity of variances, which is one of the applicability conditions of the independent samples t-test, was examined with the Leneve Test. According to the Leneve test results, it was determined as ( $F=.355$ ;  $p=.553$ ). Since the condition of  $p>.05$  was realized, the groups were homogeneous. The results of the independent samples t-test analysis of the CTTS pretest scores are shown in Table 11.

**Table 11.** Independent samples t-test results of CTTS pretest scores

Group	Test	N	$\bar{X}$	Sd	SHx	t test		
						t	df	p
Experimental Group	pre-test	40	62.45	6.965	1.101	-1.86	78	.853
Control Group	pre-test	40	62.75	7.438	1.176			

When Table 11 was examined, it was found that there was no statistically significant difference between the mean pretest scores of the experimental and control groups ( $t_{(78)}=-.186; p>.05$ ).  $H_0$  hypothesis was accepted. In this context, there is no significant difference between the critical thinking disposition levels of the experimental and control groups before the application.

**Findings related to the second hypothesis**

Dependent samples t-test was used to compare the pre-test and post-test CTTS scores of the experimental group. For this purpose, the normality of the difference scores between both measurements in the experimental group was examined first.

**Table 12.** Normality test results of experimental group pre-test/post-test difference scores

Group	Test	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistics	df	p	Statistics	df	P
Experimental Group	CTTS Difference Scores	.143	40	.039	.953	40	.098

When Table 12 is examined, since the number of data ( $Sd=40$ ) was less than 50, the result of “Shapiro-Wilk” statistic was examined. According to the statistical results, since  $p>.05$ , the difference variable in the experimental group for CTTS is normally distributed ( $p=.098$ ). Therefore, independent samples t-test was used to compare the variables.

The analysis results of the dependent samples t-test conducted to compare the pre-test and post-test CTTS scores of the experimental group are shown in Table 13.

**Table 13.** Dependent samples t-test results of the pre-test and post-test scores of the experimental group

Group	Test	N	$\bar{X}$	Sd	SHx	t test		
						t	df	p
Experimental Group	pre-test	40	62.45	6.965	1.101	-12.328	39	.000
Experimental Group	post-test	40	69.03	7.350	1.162			

When Table 13 is examined, it is seen that there is a statistically significant difference between the mean scores of the experimental group in the pre-test and post-test ( $t_{(39)}=-12.328; p < .05$ ).  $H_0$  hypothesis was rejected. While the mean score of the experimental group students in the pre-test was ( $\bar{X}=62.45$ ), the mean score of the experimental group students in the post-test was ( $\bar{X}=69.03$ ) after the implementation of mathematical modeling activities. This finding shows that mathematical modeling activities have a significant effect on increasing the critical thinking dispositions of 8th grade students.

In the study, the Eta-square coefficient ( $\eta^2$ ) was calculated to determine the effect size of mathematical modeling activities on the total scores of the experimental group students on the CTTS. It was determined that the mathematical modeling activities applied in the experimental group had a high effect ( $\eta^2=0.795$ ) on the critical thinking skills test scores of the students.



### Findings related to the third hypothesis

Dependent samples t-test was used to compare the pre-test and post-test CTTS scores of the control group. For this purpose, the normality of the difference scores between both measurements in the control group was examined first.

**Table 14.** Normality test results of the control group pretest-posttest difference scores

Group	Test	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistics	df	p	Statistics	df	p
Control Group	CTTS Difference Scores	.188	40	.001	.951	40	.083

When Table 14 is examined, since the number of data ( $Sd=40$ ) was less than 50, the "Shapiro-Wilk" statistic result was examined. According to the results of the statistics, since  $p>.05$ , the difference variable in the control group for CTTS is normally distributed ( $p=.083$ ). Therefore, independent samples t-test was used to compare the variables.

The analysis results of the dependent samples t-test conducted to compare the pre-test and post-test CTTS scores of the control group are shown in Table 15.

**Table 15.** Dependent samples t-test results of the pre-test and post-test scores of the control group

Group	Test	N	$\bar{X}$	Sd	SHx	t test		
						t	df	p
Control Group	pre-test	40	62.75	7.438	1.176	-1.563	39	.126
Control Group	post-test	40	63.28	7.197	1.149			

When Table 15 is examined, it is seen that there is no statistically significant difference between the pre-test and post-test mean scores of the control group ( $t_{(39)}=-1.563$ ;  $p>.05$ ).  $H_0$  hypothesis was accepted. There was no significant increase in the critical thinking tendencies of the control group students who were taught with the current teaching methods.

### Findings related to the fourth hypothesis

Independent samples t-test was used to compare the scores of the experimental and control groups after the intervention since the measurements of the dependent variable showed normal distribution in both the experimental and control groups. The homogeneity of variances, which is one of the applicability conditions of the independent samples t-test, was examined with the Leneve Test. According to the Leneve test results, it was determined as ( $F=.015$ ;  $p=.904$ ). Since the condition of  $p>.05$  was realized, the groups were homogeneously distributed. The results of the independent samples t-test analysis of the CTTS post-test scores are shown in Table 16.

**Table 16.** Independent samples t-test results of the CTTS post-test scores

Group	Test	N	$\bar{X}$	Sd	SHx	t test		
						t	df	P
Experimental Group	post-test	40	69.025	7.350	1.162	3.535	78	.001
Control Group	post-test	40	63.275	7.197	1.138			

When Table 16 is examined, it is seen that there is a statistically significant difference between the posttest mean scores of the experimental group and control group students ( $t_{(78)}=3.535$ ;  $p<.05$ ).  $H_0$  hypothesis was rejected. Accordingly, the critical thinking dispositions of the experimental group students in whom mathematical modeling activities were applied increased significantly compared to the control group students in whom the current teaching method was applied.

## **Discussion**

### **Discussion on Critical Thinking Skills Test**

In the first research question of the study, the effect of mathematical modeling activities on the critical thinking skills of middle school students was examined. For this purpose, mathematical modeling activities prepared in accordance with the socio-critical modeling perspective were applied in the experimental group, while the current curriculum was applied in the control group. After the application, a significant difference was found between the experimental group students' pre-test and post-test critical thinking skills test scores. The CTST scores of the experimental group students increased significantly after the application compared to the pre-application period. This indicates that mathematical modeling activities significantly enhance students' critical thinking skill levels. The increase in CTST scores of the experimental group shows that the implemented activities were highly effective in developing critical thinking skills.

Lesh and Doerr (2003) suggested that mathematical modeling activities can enhance students' critical thinking and problem-solving skills. Similar to this study, modeling activities that involve contexts familiar to students significantly impact their critical thinking abilities. Research indicates that developing students' critical thinking skills is a long and challenging process (Abrami et al., 2008). However, this study has demonstrated that critical thinking skills can be effectively developed within a span of just seven weeks.

Faciona (1990) identified that critical thinking encompasses six cognitive skills: explanation, analysis, interpretation, evaluation, inference, and self-regulation. In this study, the questions posed to students addressed all six of these skills. During modeling activities, students initially discussed the dilemmas presented in the problems and interpreted the situation on a provided worksheet. In the subsequent process, groups listened to each other's proposed solutions, evaluated these solutions, and engaged in reasoning by comparing them with their own solutions. Therefore, while working on a single context, students developed all of these skills holistically. This demonstrates that modeling activities are a concrete tool for fostering critical thinking skills. Additionally, the process of implementing these activities facilitated group work and allowed students to listen to each other's ideas. Many studies on critical thinking emphasize the necessity of collaborative work (Abrami et al., 2008; Heyman, 2008; Paul & Elder, 2016; Remdani, Susilo, Suhadi & Sueb, 2022; Xu, Wang ve Wang, 2023). Modeling activities naturally guided students towards collaborative efforts in interpreting the problems. This explains the significant increase in the CTST scores of the experimental group compared to the pre-application period.

When examining the literature, it is evident that while there are many studies on the development of critical thinking skills in disciplines such as education, psychology, and philosophy, there are limited studies in mathematics education. Research shows that students' critical thinking skills can be developed with properly planned and appropriate methods and techniques. For example, Maulidiya and Nurlaelah (2018) concluded that problem-based learning activities in mathematics education effectively develop students' critical thinking skills. Similarly, Apriliana, Handayani, and Awalludin (2019) demonstrated that the problem-centered learning approach enhanced students' mathematical critical thinking abilities. Ratnadi et al. (2023) reported a significant increase in critical thinking skills among students who learned exponential and logarithmic functions using a GeoGebra-based inverted learning method. Syaiful et al. (2022) found that a metacognitive learning approach improved students' critical thinking skills. Arisoy and Aybek (2021) observed that critical thinking skills increased in the experimental group that received topic-based critical thinking training. Monrat, Phaksunchai, and Chonchaiya (2022) reached the conclusion that open-ended questions and activities based on students' learning preferences are an effective means of developing students' critical thinking skills. In this context, the findings of the current study are consistent with those of previous studies in the literature and provide further evidence of the impact of mathematics education on the development of critical thinking skills.

In light of these studies, examining the common features of effective practices in developing critical thinking skills reveals that such practices involve environments where students are actively engaged in the learning process, see and control their own thinking processes, and work collaboratively. Therefore, teachers can support the development of students' critical thinking skills by emphasizing these types of practices in mathematics instruction.

### **Discussion on the Critical Thinking Tendency Scale**

In the second research question, the study examined the effect of mathematical modeling activities on the critical thinking tendencies of middle school students. Mathematical modeling activities prepared in accordance with the socio-critical modeling perspective were applied in the experimental group, while the current curriculum was applied in the control group. After the application, a significant difference was found between the experimental group's pre-test and post-test CTTS scores. The post-implementation CTTS scores of the experimental group students increased significantly compared to their pre-implementation scores, indicating that mathematical modeling activities effectively enhance students' critical thinking dispositions.

Critical thinking skills are important, but it is equally crucial for students to use these skills effectively in their daily lives. This is possible only if students have a tendency to think critically. Therefore, while providing students with critical thinking skills, it is also necessary to cultivate a tendency to use these skills (Halpern, 1998). In the process of solving mathematical modeling activities, students need to understand the problem correctly, generate solutions by selecting the correct knowledge bases, generalize the solution to similar situations, and evaluate the accuracy of their solutions. This process plays an important role in developing a critical thinking tendency by making students aware of their own thinking abilities.

The literature reveals various studies on critical thinking disposition in different fields. The limited studies in mathematics education show that critical thinking disposition can be developed in students using appropriate methods. For example, Asigigan and Samur (2021), in a quasi-experimental study examining the effect of gamified STEM activities on 3rd and 4th-grade students' intrinsic motivation, problem-solving skill perception, and critical thinking disposition, found significant differences between the pre-test and post-test results of students' critical thinking disposition levels. Ersoy and Başer (2014), in their quasi-experimental study with pre-service teachers, found that the scenario-based teaching method used in the Statistics and Probability course significantly increased the critical thinking disposition scores of the experimental group students. Yohannes and Chen (2024) concluded that realistic mathematics education increases students' critical thinking tendencies. In this context, the findings of the current study are consistent with previous studies in the literature.

The findings of this study show that mathematical modeling activities significantly impact the development of students' critical thinking tendencies and skills. During the implementation process, students generated solutions to real-life problems by analyzing different ideas and thoughts and created models for similar situations by generalizing the solutions they obtained. In this process, students realized that there can be more than one correct answer in real-life problems, unlike traditional mathematical questions. This encouraged students to explore different approaches, engage in logical reasoning, and use various solution strategies. All of this demonstrates that mathematical modeling activities are crucial for teaching critical thinking skills to students and fostering a tendency to use these skills effectively when necessary.

### **Limitations and Recommendation**

This study, which examines the effect of mathematical modeling activities on the critical thinking skills of middle school students, is limited to 80 students in the experimental and control groups studying in the 8th grade at a public school in Istanbul in 2023. Our study is the first of its kind in terms of revealing the effect of mathematical modeling activities on students' critical thinking skills and critical thinking dispositions. This

study offers a new approach to the development of critical thinking skills, one of the 21st century skills, and provides an opportunity for students to internalize the relationship between mathematics and real life more deeply. The results obtained will provide important clues for mathematics educators to develop more effective strategies for critical thinking skills.

Finally, experimental studies can be conducted at different grade levels to examine the effect of mathematical modeling activities on critical thinking skills. In addition, scales and tests suitable for different grade levels can be developed to measure the effect of mathematical modeling activities on critical thinking skills and critical thinking disposition.

**Statement of the Author(s)**

Ethics Committee Decision: Yıldız Technical University, Social Sciences and Humanities Research Ethics Committee. (date 27.12.2022 and number 2022.12)

**Declaration of conflict:** There is no conflict of interest.

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# The Function of the Hidden Curriculum in Acquiring Social Skills\*

## Research Article

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ARTICLE INFO	ABSTRACT
<p><i>Article History:</i></p> <p>Received: 19.08.2024</p> <p>Available online: 01.10.2024</p>	<p>The purpose of this study was to examine the social skill levels of fifth-grade students and to reveal the function of the hidden curriculum in the development of these skills. The study was conducted with fifth-grade students in a city center in eastern Turkey. Both quantitative and qualitative research methods were used. Data were initially collected using a social skills assessment scale developed by the researcher. Observations, as well as interviews with teachers, students, and parents, were conducted in the schools identified as having the highest and lowest social skill levels. Computer-assisted analysis programs were used for analyzing the quantitative and qualitative data. The study identified the functions of the hidden curriculum in the school, teacher, and student dimensions during the process of acquiring social skills. It was found that there are both similarities and differences in the hidden curricula of the two schools identified as having low and high social skill levels, and that the hidden curriculum has both positive and negative functions in the process of social skill acquisition. Based on these findings, it was concluded the functions of the hidden curriculum in the process of developing social skills should be considered, and that further studies should be conducted on this topic.</p> <p style="text-align: right;">© 2024 IOJES. All rights reserved</p> <p><b>Keywords:</b> Hidden Curriculum, Social Skills, Teacher, Student, School</p>

## Introduction

Schools are effective in providing students not only with academic skills but also with the necessary abilities to adapt to their personal and social environments. A child who socializes with a small number of individuals of different age groups in the family begins to interact with peers after entering school. Therefore, a child quickly continues acquiring social skills after attending school. The acquisition of social skills leads to acceptance in peer groups, resulting in social development. The level of positive social relationships a child develops contributes to their satisfaction and productivity in later life.

Individuals should communicate effectively with one another to have healthy lives. This ensures the unity, continuity, and peace of society. The foundation of individuals' healthy relationships with each other is

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formed by social skills (Samancı & Uçan, 2017, p. 282). Enhancing social skills during preschool and primary school years has positive effects on children's adult lives since students who are socially rejected in their classes or who display a lack of social skills face lifelong difficulties (Doyle, 2010, p. 81; Stetson, 2005, p. 2). A low level of social skills can lead to difficulties in interpersonal relationships, peer rejection, depression, aggression, anxiety symptoms, low academic achievement, and an increased likelihood of involvement in criminal activities. On the other hand, a high level of social skills fosters a positive, violence-free, anger-free, and conflict-free school environment. It also enhances children's resilience in the face of future crises and other stressful life events, increasing the number of students who can use appropriate coping strategies for aggression and frustration. As a result, there is a rise in the number of children willing to take personal responsibility in creating a positive climate at school (Karataş, 2020, pp. 15-16).

Social skills are defined as learned behaviors that enable individuals to interact with others in order to create opportunities to elicit positive responses and avoid negative ones (Cartledge & Milburn, 1986, p. 7; Gresham & Elliot, 1990, p. 2). Rewieving numerous definitions, Yazıcı and Çetin (2022) described social skills as observable social behaviors that are learned and accepted by society. They also outlined the key characteristics of social skills, including social communication and interaction, learned behaviors, their relationship with culture and environment, social reinforcement and punishment, initiation and response in social relationships, and verbal and non-verbal behaviors.

Family members are not as effective as peer groups in developing skills such as waiting their turn, sharing, leadership qualities, and dealing with hostility and bullying (Schaffer, 1996, p. 313). Classrooms and schools, where peer interaction and relationships are intense, are the most notable environments for the development of social skills. By interacting with their peers and making social comparisons, children set personal and academic goals and develop social expectations. In this way, they acquire important social skills (Stetson, 2005, p. 11). In this sense, schools have a significant impact on social skills (Zsolnai, 2002; Mulder, 2008, p. 23). Therefore, the impact of the school environment and the educational programs implemented in schools on the development of students' social skills has been the subject of investigation.

Within the framework of the curriculum, the first thing is the formal/open/written curriculum, known as the official curriculum in which the content, the teaching-learning processes, and the evaluation methods are clearly and explicitly defined (Yüksel, 2004, p. 7). Students are expected to adopt this curriculum, which is shaped by social norms. This is because students, as members of the small community represented by the school, are responsible for fulfilling their duties. In this context, the unwritten social norms, values, and beliefs that have formed within the school are subtly conveyed through the curriculum, embedded within the routines and rules that shape social relationships (Wren, 1999, p. 594; Giroux, 2001, p. 47). Besides the official curriculum, there is another type of curriculum which is not explicitly defined but has a greater impact on students. In the literature, it is referred to as the 'hidden curriculum,' 'implicit curriculum,' or 'unwritten curriculum' (Yüksel, 2004, p. 7). While the official curriculum is implemented, it is reshaped under the influence of school administrators, teachers, students, and the prevailing views and values in society. In short, the hidden curriculum becomes functional in the implementation phase of the official curriculum (Yüksel, 2005, p. 313). With the concept of the hidden curriculum, the demands of classroom life that contradict academic demands have caught the attention of educators and become a subject of study along with the official curriculum. In this way, many important points between the two curricula have been interconnected (Jackson, 1990, pp. 33-34). The hidden curriculum is understood as a set of educational values that can be seen as part of the educational system. It is a dynamic process shaped by the outcomes achieved through changes or continuity in individual and community actions. Therefore, it becomes possible to understand the hidden curriculum by being aware of it (Nagy, 2023).

Unstructured social interactions at school are considered part of the hidden curriculum. In this context, the interactions and communication among teachers, students, and other individuals can be considered as a part of hidden curriculum (Çengel Schoville, 2020, p. 82). The hidden curriculum comprises the unintended outcomes of the school process. It includes the dominant teaching and learning styles in the classroom, the messages sent from the administration, the physical environment, the teacher's expectations, and the grading processes (Ozan, 2020, p. 54). In addition, the outcomes of the hidden curriculum may not be the same for all students (Bedir, 2020, p. 9). While the official curriculum has limited relevance to the concrete realities of life outside of school, the hidden curriculum is directly connected to real life. Therefore, within the hidden curriculum, one can find the expectations, values, societal rules, and functioning of society without any alterations (Tuncel, 2019, p. 57). In this context, every teacher and school has its own unique hidden curriculum (Erkılıç, 2022, pp. 26-27).

Hidden curricula can be as effective as the official curriculum in helping students adapt to social life (Demirel, 2020, p. 7). A study examining the role of primary education in the formation of social culture identified the effects of the hidden curriculum on social preferences. Particularly, it was positively related to participation and cooperative learning. As a result, it was determined that the education provided during the primary school process plays a significant role in forming social culture, and the hidden curriculum influences this process (Takahiro, Kohei, & Fumio, 2014). Yüksel (2004, p. 35) stated that the most important function of the hidden curriculum is to introduce affective qualities in students and help them adapt to society. In their study, Kavgaoğlu and Fer (2020) found that external factors were the most influential in acquiring values according to the opinions of students and teachers, and that, according to students, the hidden curriculum was more effective than the official curriculum in teaching values. Bajaj (2020) revealed that the unintended learning experiences within the hidden curriculum could only stem from interpersonal interactions and the learning experiences shared with teachers and peers. In this sense, the hidden curriculum influences students in many ways. Therefore, schools should recognize the importance and advantages of the hidden curriculum. In conclusion, the hidden curriculum is a topic of discussion, with both positive and negative aspects (Alsubaie, 2015). It is crucial to identify the elements that function within the hidden curriculum process (Çengel Schoville, 2020, p. 88).

### **Research Purpose**

The purpose of this study was to reveal the function of the hidden curriculum in the process of acquiring social skills. Accordingly, the social skill levels of fifth-grade students were first examined. The study then sought to answer the question, "What is the function of the hidden curriculum in schools with students of high and low social skill levels in the process of acquiring these skills?" Finally, the study aimed to address the question, "What are the similarities and differences between the functions of the hidden curriculum in the process of acquiring these skills in schools with students of high and low social skill levels?"

### **Method**

#### **Research Model**

The study was conducted in two stages. In the first stage, the social skill levels of the students were examined using survey model, a quantitative research model. In the second stage, qualitative research was conducted to reveal the function of the hidden curriculum in the process of acquiring social skills, focusing on the schools and students identified in the first stage. A case study, one of the qualitative research designs, was used. Case studies require multiple methods and/or data sources to thoroughly and deeply examine the identified case. The choice of methods and how different methods are combined depends on the specific case (Berg & Lune, 2019, p. 324). Given that the study included the cases of two schools and that each school was analyzed holistically and compared with one another, a holistic multiple-case design was preferred. Thus,

mixed-method research was used in the present study. The mixed method, often referred to as the third paradigm, is an approach in which both qualitative and quantitative data are collected simultaneously or sequentially, analyzed, and presented together (Creswell, Plano-Clark, Gutmann, & Hanson, 2003, p. 212; Johnson & Onwuegbuzie, 2004, p. 15). This method is defined as a way to reach conclusions by combining the numerical data of the quantitative method with the verbal data of the qualitative method (Creswell & Plano Clark, 2011, p. 4).

### **Study Group**

The study included fifth-grade students attending schools in a city in eastern Turkey. Schools were selected from the identified educational regions in the city center. Accordingly, data related to the quantitative part of the study were collected from 2,348 students across five schools from five educational regions. It was found that the participating students were evenly distributed by gender (1,178 girls and 1,170 boys), came from middle-income families, and the majority had two or three siblings. The qualitative part of the study involved students from two schools, selected based on the highest and lowest total social skill scores among the 25 schools. For sampling, extreme or deviant case sampling was used. This sampling method allowed for the collection of more diverse data and a more multidimensional examination of the research problem from limited but equally rich cases compared to normal cases (Yıldırım & Şimşek, 2006, p. 108).

### **Data Collection and Tools**

Quantitative data were collected using the Social Skills Assessment Scale, developed by the researcher. The Bartlett Test result was calculated as 2000.0. The KMO value of the scale was .988, and the Cronbach Alpha reliability was determined as .986. The scale consists of 32 items in a single factor and is a five-point Likert scale. The highest possible score on the scale is 160, while the lowest is 32.

In the qualitative part of the study, observation and interview techniques were used to reveal the relationship between social skills and the hidden curriculum. The observation technique is a powerful method for obtaining data from natural environments and enhances the validity of the findings (Yıldırım & Şimşek, 2006, p. 173). In this context, the hidden curriculum, containing social skills and implicit messages, was uncovered through observations in natural settings. Unstructured observation and participant observation were employed within this technique. Situations outside the official curriculum, such as those in classrooms, schoolyards, and corridors, were specifically observed. The observation period lasted twelve weeks, with five hours of observation recorded weekly. In each school, observations were conducted by two observers—one being the researcher and the other an experienced observer informed about the research process. Interviews were conducted at the end of the observation period. In this context, a semi-structured interview format was used. Pre-determined interview questions were directed to teachers, students, and parents, and the interviews were recorded based on voluntary participation. Interviews were conducted with 12 teachers, 20 students, and 20 parents.

### **Validity and Reliability**

In qualitative studies, strategies such as 'credibility,' 'transferability,' 'dependability,' and 'confirmability' are established to ensure validity and reliability (Lincoln & Guba, 1985, as cited in Yıldırım & Şimşek, 2006, p. 264). In this study, data source and method triangulation were employed to increase credibility. The researcher spent a long time in the research field and interacted extensively with data sources to enhance validity. In addition, inter-coder reliability calculations were made and found to be .798. Extreme and deviant case sampling was used to increase transferability, and the research processes were reported in detail. To ensure dependability, the observation process was conducted for equal durations and time periods in each school, interviews were conducted under similar conditions, and records were kept. Coding was repeated three weeks apart for consistency. All documents related to the data and analysis phases were

archived for confirmability in order to allow verification if necessary. The study was conducted with the necessary permissions obtained from the Provincial Directorate of National Education. In addition to official permits, meetings were held with school administrators and classroom teachers before the observation process to establish permissions and voluntary participation.

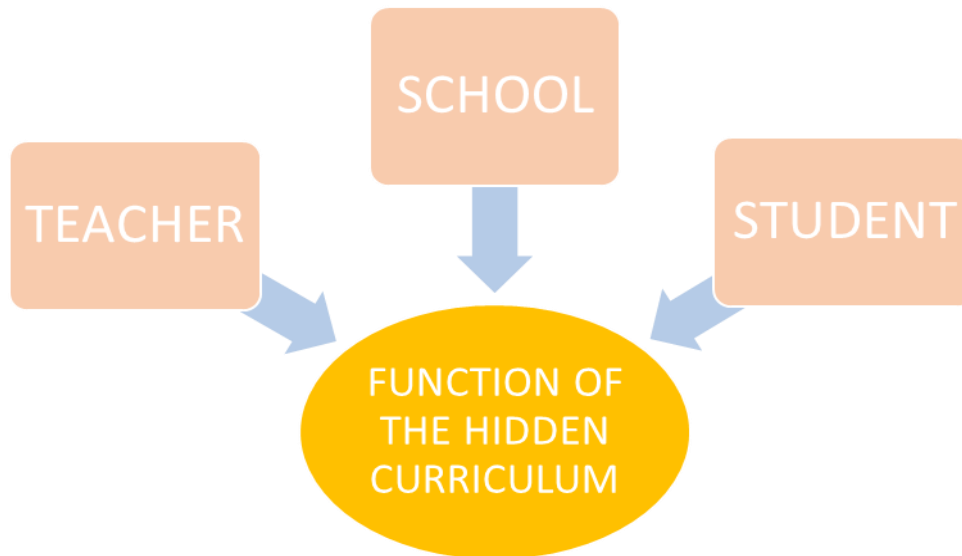
### Data Analysis

The quantitative analyses were conducted using SPSS 22. Descriptive statistics were employed to calculate the total skill scores of the schools included in the study. For the qualitative data analysis, a computer-assisted qualitative data analysis program was used. The data were analyzed using the content analysis method. Data from observations and interviews were analyzed separately. The analysis began with the observation notes. Subsequently, the data from observations and interviews were analyzed together. Initially, open codes were created, followed by the theme development process. After completing the coding and theme development stages, models were drawn for each theme. These models were presented in the findings section and were used to inform the interpretation.

### Findings

The social skills scale revealed the total social skills scores of the schools. It was found that the total skill scores ranged between 146.27 and 130.99. Based on this finding, it can be said that the students' social skill levels were high.

In the qualitative part, data obtained from school and classroom observations, as well as from interviews with teachers, students, and parents, were analyzed to examine the role of the hidden curriculum in developing social skills. It was observed that there were common themes across each data set. These themes were found to align with the nature of the hidden curriculum and to correspond with the theoretical framework. The related model is presented in Figure 1.

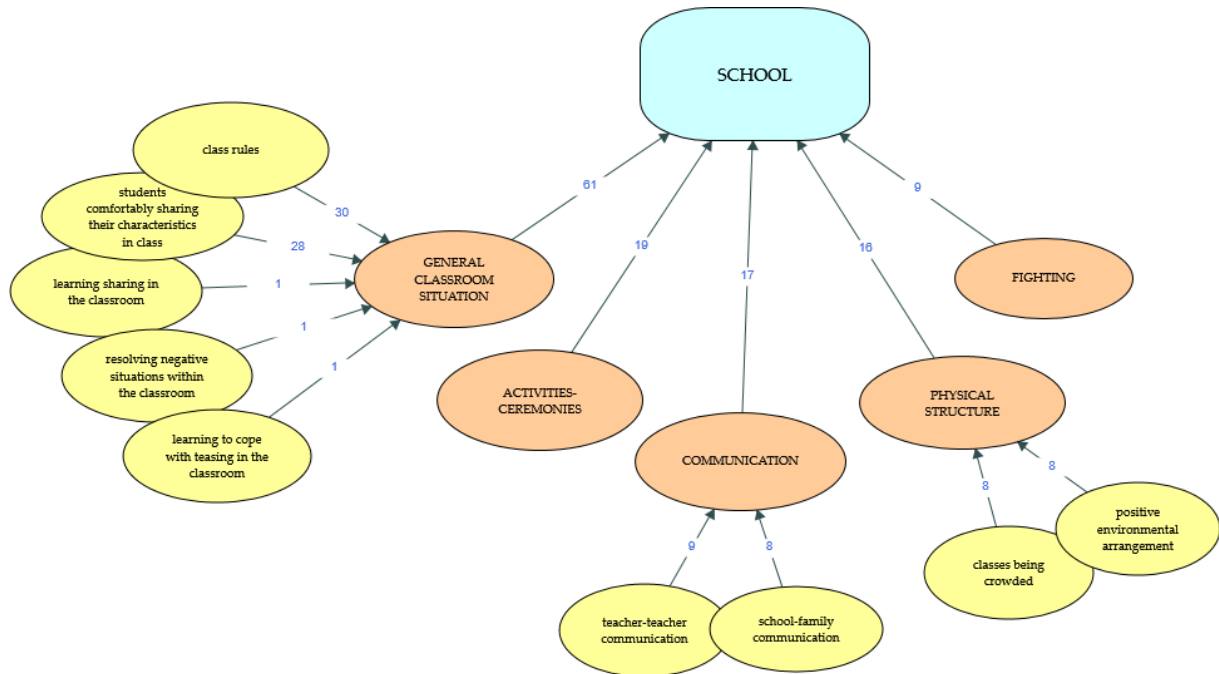


**Figure 1.** The Role of the Hidden Curriculum in Developing Social Skills

As shown in Figure 1, the hidden curriculum had three main dimensions: its role related to the school, the teacher, and the student. Subsequent analysis was carried out within the scope of these three main themes. The models related to the findings were presented accordingly in order to reveal the role of the hidden curriculum in fostering social skills across the school, teacher, and student dimensions.

### Findings Related to School A with High Social Skill Levels

The analyses related to School A, which was identified through quantitative data as having the highest social skill score (HSSL), are presented under this heading. It was determined that the hidden curriculum at HSSL School plays a role in developing social skills across the dimensions of school, teacher, and student. The models for each dimension are presented below in sequence.



**Figure 2.** Model of the Function of the Hidden Curriculum in the School Dimension at HSSL School

Figure 2 shows the themes created for the school dimension of the hidden curriculum and the coding frequencies. It was found that the hidden curriculum functions in developing social skills through general classroom conditions, school-wide events and ceremonies, and the communication processes prevalent within the school. In addition, the physical structure of the school and the witnessed conflicts at school were identified as having functions. In the classroom, it was observed that there were established classroom rules, that students shared personal situations with each other, and that they learned skills such as sharing and coping with mocking within the classroom. Moreover, the events and ceremonies organized at the school, as well as the communication processes between teachers and between the school and families, were found to contribute to social skill development. Furthermore, it was found that the events and ceremonies organized at the school, the communication processes between teachers and between the school and families, and the school’s positive environmental features were functional in skill development. These findings revealed that that general classroom conditions, organized events and ceremonies, communication processes, and the school’s physical structure are supportive elements in fostering social skills. Despite these positive functions, large class sizes and the occasional conflicts observed among students within the school premises were identified as negative factors.

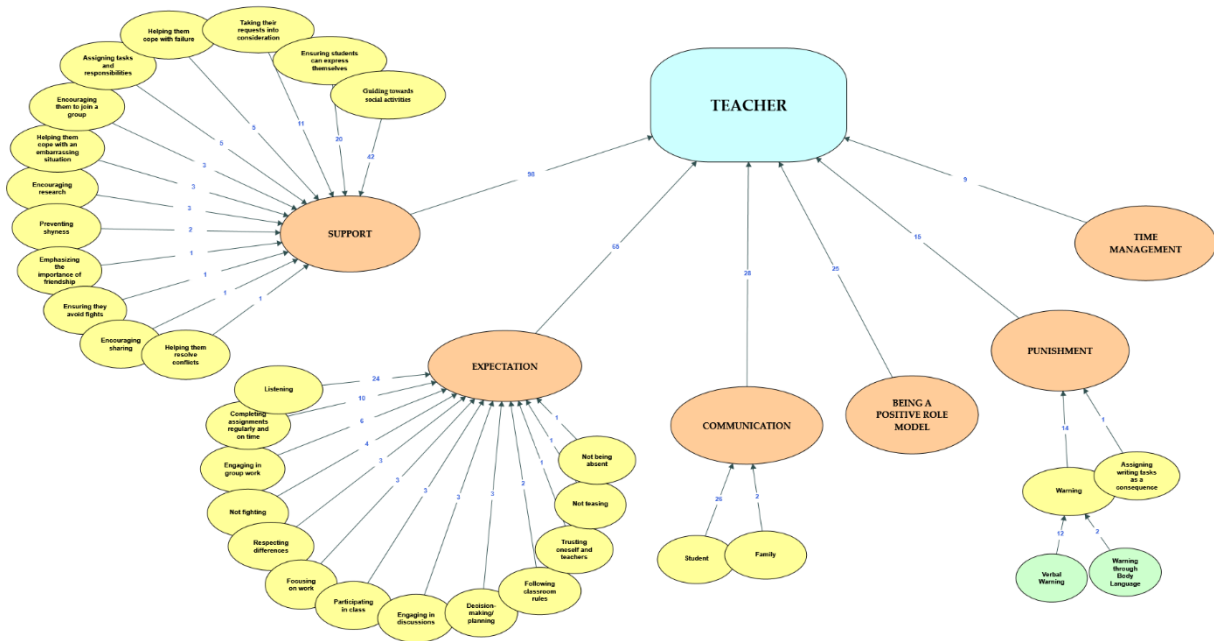


Figure 1. Model of the Function of the Hidden Curriculum in the Teacher Dimension at HSSL School

Figure 3 shows that the highest coding frequency was related to the teacher's role in supporting social skills. It was found that the teacher emphasizes social skills and supports students in the process of acquiring them. In this context, the teacher was observed to help students express themselves, consider their desires, assist them in coping with failure, assign tasks and responsibilities, encourage group participation, help them deal with embarrassing situations, motivate them to conduct research, work to overcome shyness, assist in resolving conflicts, emphasize the importance of friendship, encourage sharing, and help them avoid conflicts.

Another finding was teacher's expectations. It was found that the teacher has expectations regarding social skills, such as listening, completing homework regularly and on time, participating in group work, avoiding conflicts, respecting differences, participating in class, focusing on tasks, making decisions and planning, engaging in discussions, following classroom rules, trusting themselves and their teachers, planning, attending regularly, and refraining from mocking others. In addition, findings regarding positive communication with students and their families emerged. The teacher's communication with students and their families can be considered a positive function of the hidden curriculum in fostering social skills. Another positive function was the teacher serving as a positive role model in terms of social skills.

Findings also revealed how the teacher handled negative situations and managed time. Regarding disciplinary actions, it was found that the teacher issued warnings, assigned writing tasks as punishment, and resorted to deprivation. The teacher primarily used verbal warnings and body language to address issues. It was noted that the teacher stayed in the classroom during recesses to engage with students. This time was used for completing time-consuming group work, evaluating project assignments, and preparing for the next lesson. Furthermore, it was observed that as the end of the term approached, the teacher planned daily activities in the schoolyard for students to socialize. The teacher's ability to manage time effectively to create opportunities for students to develop social skills can be seen as another positive function of the hidden curriculum.

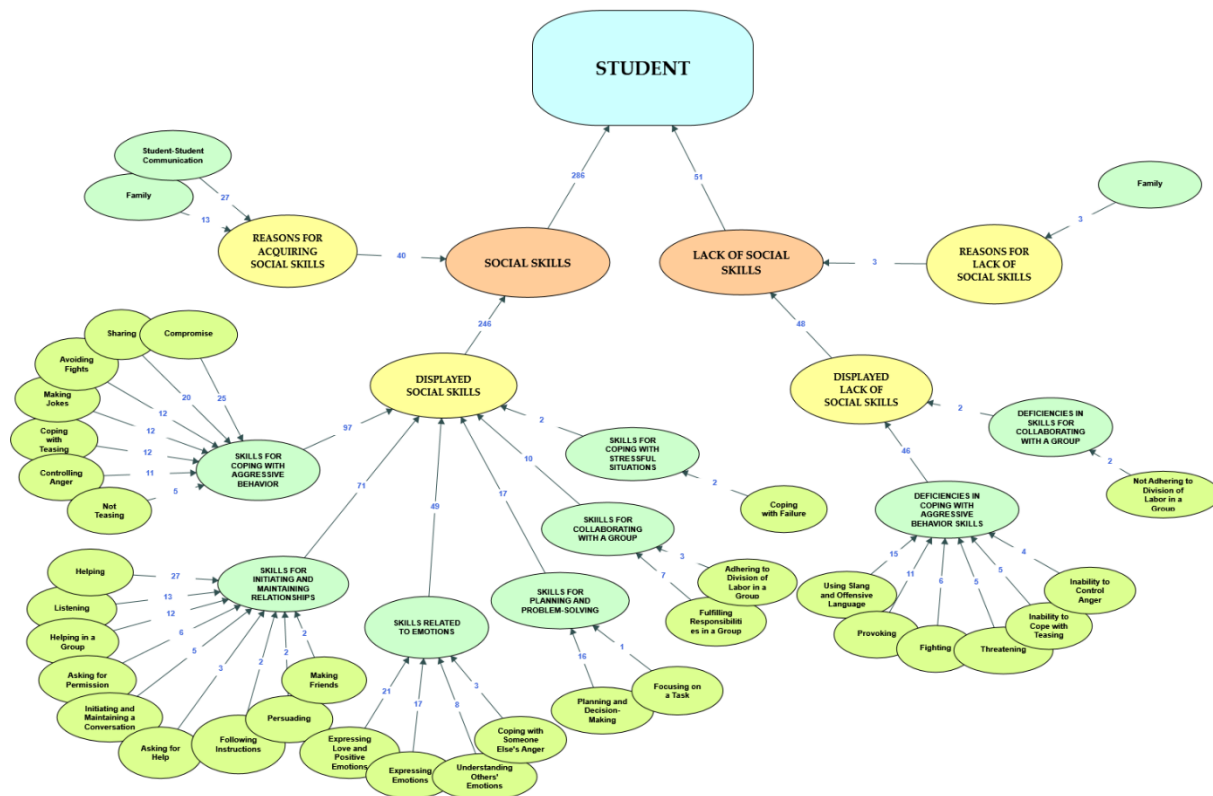


Figure 2. Model of the Function of the Hidden Curriculum in the Student Dimension at HSSL School

Figure 4 shows the student-related functions of the hidden curriculum in the process of skill acquisition. The social skills displayed by students, along with their skill deficiencies and the reasons for these deficiencies, were identified. It was found that students most frequently demonstrated skills related to managing aggressive behaviors. Within this category, skills such as conflict resolution, sharing, avoiding fights, using humor, coping with teasing, controlling anger, and refraining from mocking others were observed.

Following this, it was revealed that students exhibited skills related to initiating and maintaining relationships, such as helping, listening, speaking comfortably in groups, asking for permission, initiating and sustaining conversations, seeking help, persuading, and making friends. In terms of emotional skills, students demonstrated the ability to express love, positive feelings, and other emotions, understand others' feelings, and cope with others' anger. In addition, students were found to display skills in planning and problem-solving, working with a group, and managing stressful situations. Within this group of social skills, planning, decision-making, focusing on tasks, fulfilling responsibilities within a group, and adhering to the division of labor were identified.

Another finding related to the student dimension of the hidden curriculum was the reasons for the demonstration of social skills. An analysis of these reasons revealed that they stem from student-to-student communication and family influences. The importance of communication between students and the influence of their families were highlighted. Deficiencies in social skills and the possible reasons for these deficiencies were also identified. Students were found to have deficiencies in managing aggressive behaviors and in working with a group. These deficiencies were listed as the use of slang and profanity, provoking others, fighting, inability to cope with teasing, threatening others, and failing to control anger. It was suggested that these deficiencies in social skills are primarily family-related.

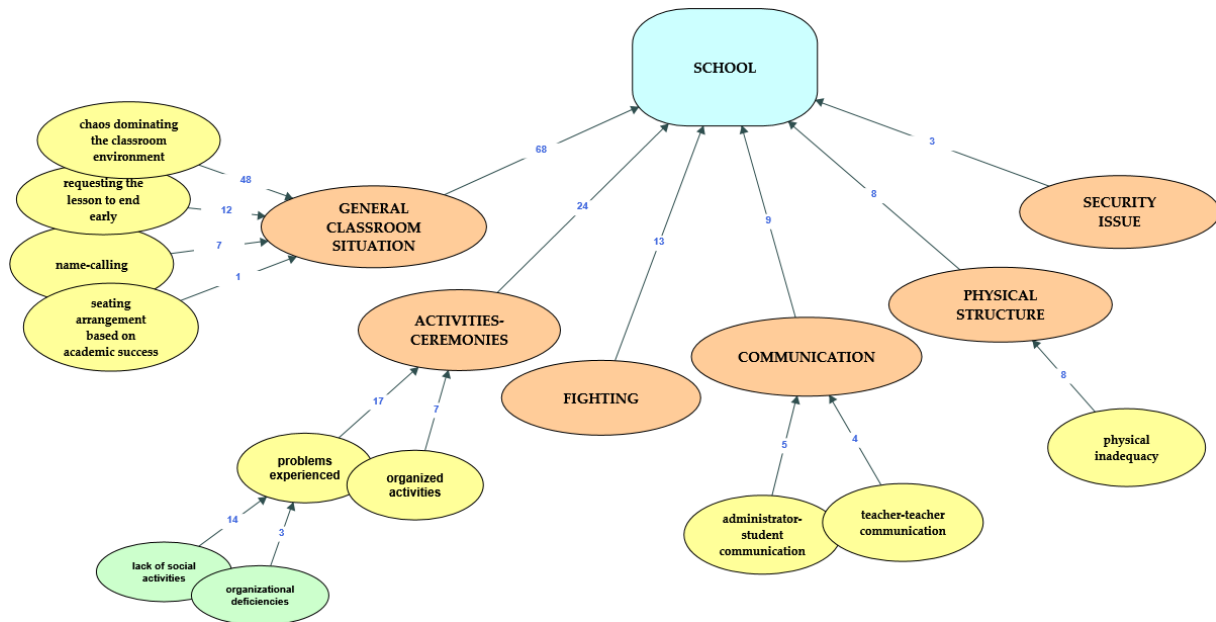
When comparing the coding frequencies of the social skills demonstrated with those of the skill deficiencies, it was found that the social skills exhibited by students at HSSL School ( $f=288$ ) are higher than the



skill deficiencies ( $f=51$ ). This finding supports the high average score the school received on the social skills scale in the quantitative part of the study.

### Findings Related to School B with Low Social Skill Levels

The analyses related to School B, which was identified through quantitative data as having the lowest social skill score (LSSL), are presented in this section. It was found that the hidden curriculum at LSSL School plays a role in developing social skills across the dimensions of school, teacher, and student. The models for each dimension are provided below in sequence.



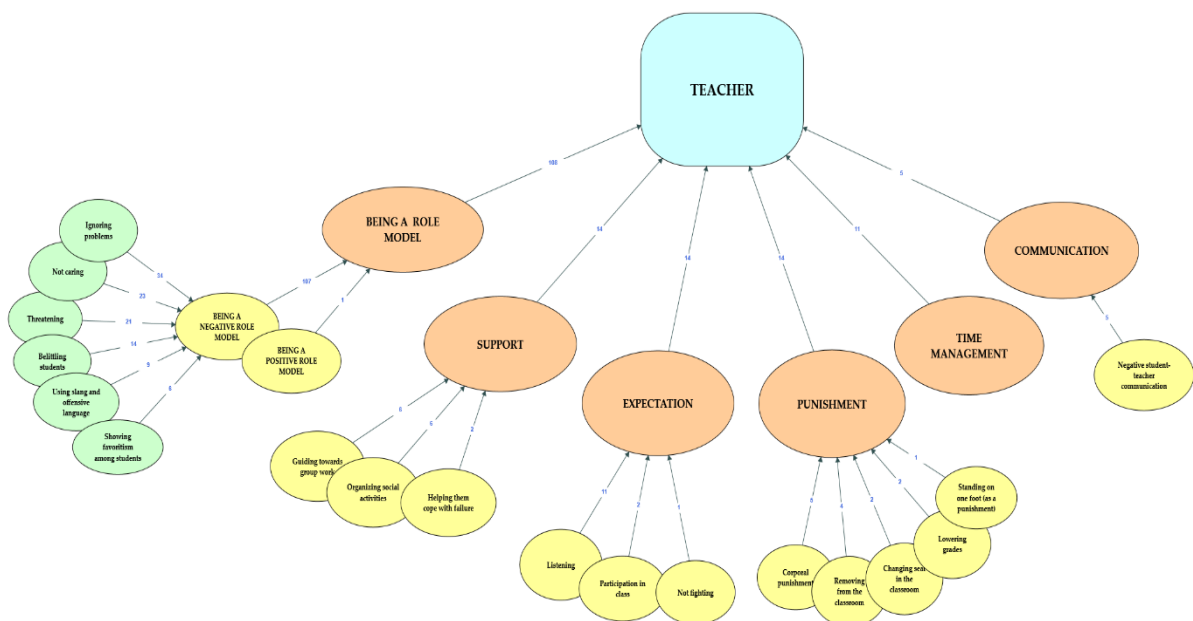
**Figure 5.** Model of the Function of the Hidden Curriculum in the School Dimension at LSSL School

As shown in Figure 5, the hidden curriculum functions in the school dimension was related to general classroom conditions, school-wide events and ceremonies, and communication between teachers and between administrators and students. Also findings related to the school's physical structure, conflicts observed on school grounds, and emerging security issues were identified.

Regarding general classroom conditions, findings revealed the chaos dominating the classroom environment, the desire to finish the lesson early, the use of nicknames in the classroom, and seating arrangements based on academic achievement. It was found that chaos and disorder were prevalent in the classroom environment at LSSL School. The constant presence of disorder and lack of rules in the classroom could lead students to generalize this behavior, causing them to experience difficulties with rules and order in their daily lives. It was also found that both students and the teacher wanted to end the lesson as soon as possible, which can be seen as a result of the disorder and chaos in the classroom environment.

Among the functions of the hidden curriculum, findings regarding events and ceremonies held at the school emerged. It was revealed that there was a significant emphasis on the problems experienced during these events. It was found that there were deficiencies and organizational issues related to these events. In addition, findings emerged concerning communication between administrators and students, as well as communication among teachers. It was found that there was both positive and negative communication between students and administrators. While students generally expressed positive comments about their communication with the school principal, they used negative expressions regarding their communication with vice principals. Furthermore, students noted that teachers formed cliques and that some classroom teachers had close relationships with only a few other teachers.

It was found that fights frequently occurred both inside and outside the school at LSSL School. These fights involved not only students but also outsiders, and it was noted that all students were exposed to scenes of violence. This indicates that negative examples were observed by students both inside and outside the school. Considering that such behaviors are learned through observation, it can be said that such a situation has negative consequences in the process of acquiring social skills. Regarding the school's physical structure, it was determined that classrooms were overcrowded, school buildings were inadequate for games and sports activities, and there was a lack of proper landscaping. In addition to these deficiencies related to the physical structure, it was found that there were security issues at the school. Security lapses were identified at the school entrances and exits, allowing outsiders to enter the premises easily. It was determined that this situation caused fear among the students. This reduction in play and socialization areas within the school due to security concerns likely has negative consequences in the process of acquiring social skills.



**Figure 6.** Model of the Function of the Hidden Curriculum in the Teacher Dimension at LSSL School

Figure 6 indicated that the teacher's role as a model was included in the hidden curriculum. In the process of acquiring social skills, the teacher was identified as both a positive and negative role model for the students. However, it was noted that the coding related to the teacher being a negative role model was significantly higher. During the research process, only one positive behavior of the teacher was recorded as a model.

Under the category of negative modeling, it was found that the teacher ignored problems, did not care about the students, threatened students, belittled them, used slang and profane language, discriminated among students, and exerted pressure on them. This highlights that the teacher was a negative role model in terms of social skills. Furthermore, it was observed that the teacher ignored certain negative behaviors such as fighting, arguing, teasing, not listening, using slang, and not following classroom rules. As a result, it can be stated that the teacher's failure to intervene in negative behaviors in a timely manner, or their tendency to ignore them, led to an increase and reinforcement of such behaviors.

Another finding revealed that the teacher prioritized academic success over students' social skills, showing little concern for the latter. This suggests that the teacher was insufficient in organizing social activities and intervening to address skill deficiencies, which are crucial in the process of acquiring social skills.

Moreover, the teacher’s tendency to belittle and threaten students could negatively impact the students' ability to acquire and demonstrate social skills.

Despite being a negative role model, the teacher’s support for social skills and expectations was also mentioned. These included the teacher’s encouragement of group work, organizing social activities, helping students cope with failure, and expectations related to listening, not fighting, and participating in class. However, the codes related to negative role model behaviors (107) were found to be significantly higher than those related to supportive behaviors (14) and expectations (14).

Another finding involved the disciplinary actions taken in response to undesirable behaviors. The teacher was found to use punishment methods such as physical punishment, expelling students from the classroom, changing their seating arrangements, making them stand on one foot, and lowering their grades. These types of punishments may have negative effects on students in the process of acquiring social skills and in many other aspects.

In addition to the punishment system, it was found that the teacher’s time management also contributed negatively to the hidden curriculum. Specifically, it was found that the teacher frequently arrived late to class and left immediately when the bell rang. This could have resulted in less time spent with the students, reducing the chances to get to know them, detect negative behaviors in a timely manner, and intervene effectively. Furthermore, findings indicated negative communication between the teacher and students. This could potentially reduce the teacher's positive influence on students' social skill development or increase their negative impact.

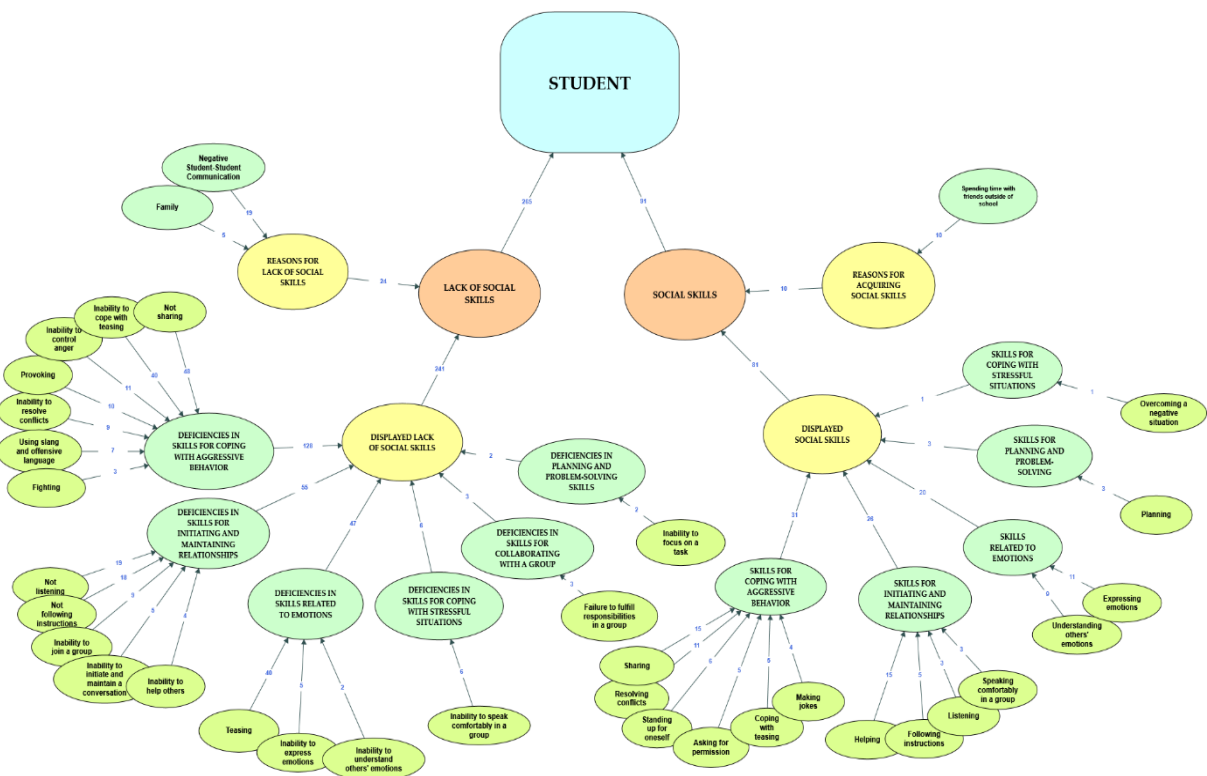


Figure 7. Model of the Function of the Hidden Curriculum in the Student Dimension at LSSL School

As shown in Figure 7, social skill deficiencies ( $f=265$ ) were identified more frequently than social skills ( $f=91$ ). The identified social skill deficiencies were related to managing aggressive behaviors, initiating and maintaining relationships, emotional skills, coping with stress, working with a group, and planning and problem-solving skills. In the category of deficiencies in managing aggressive behaviors, behaviors such as

fighting, using slang and profanity, inability to resolve conflicts, teasing, failure to control anger, inability to cope with teasing, and lack of sharing were identified.

In the category of deficiencies in initiating and maintaining relationships, behaviors such as not listening, not following instructions, inability to join a group, inability to initiate and sustain conversations, and lack of helping others were identified. Emotional skill deficiencies included teasing, inability to express emotions, and failure to understand others' emotions. In the category of deficiencies in coping with stress, the inability to speak comfortably in public was identified. Another category of deficiencies was in working with a group, where the failure to fulfill responsibilities within the group was noted. In terms of planning and problem-solving skills, students were found to have difficulty focusing on tasks.

The reasons for these social skill deficiencies were also identified. The findings indicated that these deficiencies were due to negative student-to-student communication and family-related factors. It was found that there were disagreements, conflicts, threats, and belittling among students, and that they did not spend time together outside of school. This suggests that there is negative communication among students, which could negatively impact their social skill development. Another reason for social skill deficiencies was attributed to family factors. It was found that due to the families' socio-economic status, they were unable to participate in social activities and different environments, showed a lack of interest, and had negative family relationships.

The model also revealed the social skills exhibited by students and the reasons for acquiring these skills. The social skills demonstrated by students included managing aggressive behaviors, initiating and maintaining relationships, emotional skills, planning and problem-solving, and coping with stress. The most frequently coded skill in managing aggressive behaviors was sharing. It was also found that students demonstrated skills such as standing up for themselves, asking for permission, coping with teasing, and using humor. Another category of social skills identified was initiating and maintaining relationships, which included helping others, following instructions, speaking comfortably in groups, listening, and expressing oneself. Emotional skills such as understanding others' emotions, expressing positive feelings, and expressing their own emotions were also coded. In addition, planning, problem-solving, and coping with stress were observed as social skills exhibited by students. The reason for the acquisition of these social skills was attributed to students spending time together outside of school. This interaction among peers can be considered a positive function of the hidden curriculum in the process of acquiring social skills.

### **Conclusion, Discussion, and Recommendations**

This study was conducted to investigate the function of the hidden curriculum in the process of developing social skills. In the first stage, a social skills scale developed by the researcher was administered to a total of 2,348 fifth-grade students from 25 schools. The results showed that the total skill scores ranged from 146.27 to 130.99, indicating a high level of social skills. Based on these scores, two schools with the highest and lowest total skill scores were selected for the second stage of the study. In this stage, qualitative methods were employed. Through extended observations and subsequent interviews with teachers, students, and parents, the hidden curriculum of both schools was uncovered. The results related to the school, teacher, and student dimensions of the hidden curriculum were obtained for both schools.

In the school dimension, the hidden curriculum was found to function in the development of social skills through general classroom conditions, school events and ceremonies, communication processes within the school, physical structure, and incidents of conflict. In the school with a high level of social skills, it was found that classroom rules were primed, creating an environment that encouraged the development of social skills and effectively resolved negative situations. This suggests that general classroom conditions are a supportive factor in the process of developing social skills. In addition, the events, ceremonies, and

communication processes between teachers and between the school and families were found to have positive functions in the acquisition of social skills. However, negative functions were also identified, such as overcrowded classrooms and conflicts observed among students within the school grounds.

In the school with a low level of social skills, it was found that general classroom conditions had negative functions in skill development. There was generally chaos and a lack of rules in the classroom, students were reluctant to participate in lessons and classroom activities, they used nicknames for each other, and seating arrangements were based on academic achievement. Regarding school events and ceremonies, it was found that there were deficiencies in social activities and organization. Furthermore, negative functions of the hidden curriculum were observed in terms of communication between students and administrators, and between teachers. Frequent conflicts were reported in the schoolyard and hallways, and large fights involving outsiders occurred after school, with all students witnessing these incidents. It can be said that students were negatively affected in their skill development due to learning aggressive behaviors through observation. The physical inadequacies of the school were also noted, including overcrowded classrooms, insufficient schoolyard facilities for developing social skills, and security issues. These conditions may have contributed to the lack of safe spaces for play and socialization, potentially leading to social skill deficiencies.

One of the key findings of the study was the role of the hidden curriculum in developing social skills through the teacher's influence. In the school with a high level of social skills, the hidden curriculum in the teacher dimension was found to support the development of social skills. The teacher was shown to support students in expressing themselves, coping with failure, assigning tasks and responsibilities, participating in group activities, dealing with embarrassing situations, encouraging research, overcoming shyness, resolving conflicts, promoting sharing, and avoiding conflicts. Furthermore, the teacher was attentive to students' needs and emphasized the importance of friendship.

Besides supporting social skills, the teacher was found to have specific expectations regarding these skills. These expectations were seen to promote the development of social skills. The expectations included listening, completing homework regularly, participating in group work, avoiding conflicts, showing respect, engaging in class, focusing on tasks, making decisions and planning, participating in discussions, following classroom rules, trusting themselves and their teachers, planning, maintaining attendance, and refraining from mocking others. Teacher expectations often emerge naturally in daily school life and are effective in developing students' potential (Babad, 1990; Good, Sterzinger, & Lavigne, 2018) and fostering academic motivation (Wei, 2024). Similarly, İğde (2021) concluded in a review that teacher expectations positively influence academic achievement and social behavior, and that these expectations should be set at a high level. Based on these studies, it can be concluded that expectations within the hidden curriculum may have positive functions in the process of developing social skills.

Another function of the hidden curriculum in the teacher dimension was the positive communication between the teacher and both students and families. Gürgen (2019) found significant relationships between the teacher-student relationship and children's social skills. Another study identified teacher-student interaction as the most influential factor in the in-school socialization process (Uslu & Genç, 2021). These findings support the results of the present study. In addition, results indicated the teacher's role as a positive role model. Considering that social skills are often learned through modeling (Bacanlı, 2012; Karataş, 2020), being a role model can be seen as another function of the hidden curriculum in the teacher dimension.

The study also revealed findings related to the teacher's use of disciplinary measures. It was found that the teacher primarily issued warnings, using verbal and body language cues to address negative behaviors, and if the behavior persisted, the teacher employed deprivation and assigning lengthy writing tasks as punishments. The hidden curriculum was also found to have functions related to time management. It was observed that the teacher spent a significant amount of time with students, even using break periods for time-

consuming group projects, assignments, and preparation for the next class. This suggests that the teacher effectively used time to engage with students in ways that supported the development of social skills, leading to the conclusion that the teacher positively influenced the students' social skill development.

In the school with low social skill levels, both positive and negative functions of the hidden curriculum in the teacher dimension were identified. However, it was found that negative functions were predominant. The teacher's role as a model revealed many negative aspects. The teacher was found to ignore problems, disregard students, threaten them, belittle them, use slang and profanity, show favoritism, and exert pressure on students. It was also determined that the behaviors the teacher ignored included fighting, arguing, teasing, not listening, using slang, and not following classroom rules. As a result, it can be concluded that the teacher's failure to intervene in negative behaviors and tendency to ignore them led to an increase and reinforcement of these behaviors. In addition, it was found that the teacher did not prioritize social skills but instead focused on academic success.

Although the amount was quite low, there were some instances where the teacher supported social skills by encouraging group work, organizing social activities, and helping students cope with failure. The teacher also had positive expectations, such as listening, avoiding conflicts, and participating in class. However, the disciplinary methods used by the teacher were found to have negative effects on the process of acquiring social skills. The teacher was reported to use punishments such as physical discipline, expelling students from the classroom, changing their seats, making them stand on one foot, and lowering their grades. It was also found that the teacher frequently arrived late to class, left immediately when the bell rang, and spent little time with the students. This resulted in poor communication between the teacher and students. Consequently, the teacher was likely ineffective in getting to know the students, intervening in negative behaviors, and reinforcing positive behaviors.

The study also revealed the functions of the hidden curriculum in the student dimension for both schools. The findings related to students' social skills and skill deficiencies, as well as the reasons for these deficiencies, were identified. In the school with high social skill levels, students demonstrated a high level of social skills, including managing aggressive behavior, initiating and maintaining relationships, emotional skills, planning and problem-solving, working with a group, and coping with stress. The reasons for these social skills were attributed to student communication and family influences. Since social skills are often learned through modeling and unsystematic methods within peer groups and families (Avcıoğlu, 2012), the high number of social behaviors demonstrated by students across various skill categories suggests that the hidden curriculum had a positive functional role. In conjunction with the demonstrated social skills, the research also identified skill deficiencies. The students were found to have deficiencies in managing aggressive behaviors and working with a group. The primary reason for these social skill deficiencies was attributed to family influences.

In the school with low social skill levels, the hidden curriculum in the student dimension revealed that students predominantly exhibited social skill deficiencies. The identified deficiencies were related to managing aggressive behaviors, initiating and maintaining relationships, emotional skills, coping with stress, working with a group, and planning and problem-solving. The causes of these social skill deficiencies were attributed to negative student-to-student communication and family-related factors. The negative communication processes among students may result in adverse outcomes during the process of acquiring social skills. Family influences were also found to be a significant cause of social skill deficiencies, with factors such as low socio-economic status, lack of participation in social activities and diverse environments, indifference, and negative family relationships playing a role. The literature suggests a significant relationship between positive parental attitudes and social skills, with children of parents who exhibit positive attitudes

having higher social skill levels (Parsak, 2015). Similarly, another study found a significant relationship between parents' personality traits and their children's social skills (Gger, 2018).

Considering the results of this study, it is evident that the hidden curriculum plays a highly functional role in the process of acquiring social skills. At this point, it is recommended that teachers and administrators increase their awareness of the hidden curriculum and ensure that the official and hidden curricula work together to promote social skill development. Schools should address physical inadequacies and create environments that provide students with opportunities to develop social skills. Furthermore, interpersonal interactions should be enhanced, and events and ceremonies should be made more effective in supporting social skills. Teachers should also improve their competencies in social skill education. Finally, new studies should be conducted to explore the functionality of the hidden curriculum from different perspectives and to emphasize its importance in the development of social skills.

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# Prospective Teachers' Views on the Hidden Curriculum: A Mixed Research Model

Research Article

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## ABSTRACT

The main purpose of this research is to determine the opinions of prospective teachers about the hidden curriculum and to examine these opinions in terms of various variables. The embedded pattern from mixed approaches was used in the research. The Sample of the research consists of 945 students attending 9 different departments of Elazığ Firat University Faculty of Education in the fall semester of the 2021/2022 academic year. A total of 27 prospective teachers were reached for the qualitative dimension of the research. The principle of volunteerism was taken as the basis in both dimensions of the research. The "Hidden Curriculum Scale", a reliable and valid scale developed by Akbulut and Aslan (2016), was used as a data collection tool in the research. An interview form developed by the researchers was used as a qualitative data tool. Kolmogorov-Smirnov (K-S) normality test was performed on the obtained quantitative data and it was found that the distribution of the data was normal. For this reason, independent groups t-test was used in two-variable comparisons, and one-way analysis of variance was used in cases with more than two variables. In the analysis of qualitative data; content analysis method was used in accordance with the phenomenological pattern. When the results of the research were examined, significant differences were observed in some demographic characteristics of prospective teachers. Various suggestions have been developed in connection with the findings of the research.

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## Keywords:

Hidden curriculum, prospective teacher, curriculum

## Introduction

The hidden curriculum covers all the achievements, opinions, feelings and practices achieved by students in the classroom, extracurricular activities that are not explicitly stated outside of the formal, written curriculum (Gürol, 2004: p.108). The hidden curriculum refers to norm values and beliefs that are transmitted to students but not explicitly stated. It has the power to influence students as much as the official curriculum.

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It also has an impact on teachers in terms of evaluating students. One of the negative effects of the hidden curriculum is that it prevents solidarity and unity among students (Giroux, 1978: p. 148). Posner (1995: p. 11) stated that the power of hidden curriculum to influence is more than the official curriculum.

When the relevant literature is reviewed, it is seen that the hidden curriculum was first used as a concept in 1968 (Jackson, 1968: p.34). Previously, Dewey (1916: p. 298) by talking about the increasing orientation towards democracy in schools, while Durkheim (1961: p.148), they referred to the hidden curriculum as the content, arguing that more is being taught than the official curriculum. The hidden curriculum has been defined many times by emphasizing its various functions by different researchers in its historical development (Vallance, 1974; Martin, 1976; Apple, 1982; Mariani, 1999; Parmar and Makwana, 2013). The word hidden itself is also used by some researchers in the literature in the sense of intentional harm, while others have used it only in the sense that it is not clearly visible or indicated (Hubbard, 2010: p. 11).

When looking at all the definitions of the hidden curriculum, a number of common features emerge (Gürol and Yıldırım, 2022: p. 59). These are that the hidden curriculum appears intentionally or unintentionally, has no definite boundaries, is influenced by the dominant norms of society and is part of the acculturation process. The fact that each school has a different hidden curriculum is one of these common features.

Demirel (2014: p. 7) defined the hidden curriculum as a broad concept that also covers extracurricular activities. A number of organizational, relational and institutional resources are taken into account when creating hidden curriculum activities. These are; time, opportunities, relationships, policies and routines. Yüksel (2004: p. 57-71) explained the organizational resource as school rules, school architecture, classroom formation, time and extracurricular activities. Relational resources include social norms and values, ideology and textbooks. On the other hand, the institutional resource includes teacher opinions, expectations and prejudices, classroom rules and teacher behaviours. The hidden curriculum meets the requirements of education/training activities mostly in the educational dimension (Gürol, 2004: p. 108). More moral rules and values are transferred through the hidden curriculum (Jachim, 1987: p. 84, Bacanlı, 2011: p. 46: Kohlberg, 1983: p.76). It is the curriculum that has the strongest impact on the performance of values (Gaikwad, 2004: p. 10).

Bowles and Gintis emphasized its capitalist function by moving the hidden curriculum not into the educational system, but into social life (1976). Another author who argues that the school serves capitalism through a hidden curriculum is Apple (1996). Apple claimed that some important information was not given to low-status students and that they were trained to obey authority (2019: p. 236).

The hidden curriculum can be associated not only with one level of education, but also with all levels and types of institutionalized education (Yüksel, 2002b: s. 364). Teachers consciously or unconsciously make informal demands and do not express it clearly. Although these requests are made for the benefit of the students, in such cases, students enter into an unsafe and uncertain relationship with their teachers. This type of relationship is also evaluated among the negative outputs of the hidden curriculum (Bergenhengouwen, 1987: p. 535). In such a case, we come across two different universities: an ideal university created with an official curriculum and a real university formed with a hidden curriculum. In order to be successful, students also have to meet the hidden demands in the hidden curriculum (Ahola, 2000). The contradiction between the hidden curriculum and the demands of the official curriculum (Bergenhengouwen, 1987: p. 541) is another inevitable situation (Bacanlı, 2011: p. 46).

Curriculum development specialists should understand the importance of the hidden curriculum and take it under control so that it does not function incorrectly (McNeil, 1981: p. 236). Teachers should also not neglect it in order to avoid the negative effects of the hidden curriculum (Massialas, 199: p. 67). Only teachers and curriculum developers are not responsible for the omission or misuse of the hidden curriculum. Students

also do not have an awareness of the hidden curriculum and therefore cannot use it effectively (Alsubaie, 2015: p. 125).

Another example of the high impact power of the hidden curriculum in universities is that although they apply almost the same official curriculum, some universities are very popular and some of them are ordinary. What makes these universities popular are the opportunities they offer, the qualities that appear in the hidden curriculum, such as the incoming student profile (Eisner, 1994: p. 95). The hidden curriculum is more effective in university preferences than the official curriculum (Doğan and Türkmen, 2019: p. 863; Çatı, İstar and Özcan; 2016: p. 175).

Different authors (Giroux, 1983; Skelton, 1997; Lynch, 1989) have discussed the theoretical foundations of the hidden curriculum in different groups (Yüksel, 2004: p. 15). It is a more effective way to give by hiding ideas and ideologies in education. The dominant ideology and ideas in Turkey from the 1950s to the present have been given secretly through education (Yüksel, 2004: p. 106)

The centralized educational structure in Turkey has been insufficient to meet the needs of different regions. This situation has led to the neglect of the official curriculum and the formation of educational activities with a hidden curriculum. The curriculum development studies were focused on the official curriculum and the hidden curriculum was not included in these studies (Yüksel, 2004: p. 106). Academic studies related to the hidden curriculum in Turkey started with Bacanlı (1998) and Demirel (1999, cited in Yüksel, 2004). Subsequently, Yüksel (2002a) and Tezcan (2003) carried out studies aimed at introducing this curriculum (Yüksel, 2004: p. 109). Compared to other countries, these dates are very late for Turkey (Öztürk and Taşpınar, 2021: p. 285)

In the Türkiye Century Maarif Model (Milli Eğitim Bakanlığı, 2004), a multifaceted, holistic educational approach was adopted, the scope of the official curriculum was expanded with “school-based planning” and “extracurricular activities”, and the area of influence of the hidden curriculum was partially controlled. It is aimed to raise a “competent and virtuous person” in the student profile, which aims to develop spiritual and physical qualities. In the model, learning environments are planned in which social and intellectual tendencies can be clearly revealed and observed, not hiddenly. Decoupling social-emotional learning skills, which are one of the inter-program components of the model and the most important element of the hidden curriculum, not as a separate content or learning output, but by penetrating all educational curriculum is an important step within the scope of hidden programming. Again, the hidden provision of literacy skills from these components in a spiral manner is an important development in hidden programming. The contribution of the Research Report on 21st Century Skills and Values published in 2023 (Türel, Şimşek, Şengül Vautier, Şimşek and Kızıltepe, 2023) to the inclusion of these skills in the model is undeniable. This report lists 46 sub-skills and 11 values.

The curriculum of higher education institutions in Turkey are not as detailed and overly centralized as primary and secondary education. The higher education law is planned and programmed within the framework of general objectives and basic principles (Yükseköğretim Kanunu, 1981). The general objectives of the higher education law also include many achievements from the affective field and it is stated that it corresponds to advanced steps in both cognitive and affective field taxonomy (Krathwohl, Bloom and Masia, 1964). Yüksel (2002b: p. 367) considers it debatable whether some of these goals have been realized. He stated that some of them could not be realized. The fact that these goals are affective field gains and correspond to the last steps in taxonomy makes them difficult to measure and evaluate, and therefore the dynamics of curriculum development. Another difficulty is that affective field achievements are not a criterion for passing to the upper class or graduating. The achievements of the cognitive field are taken into account in passing the class and graduating (Nartgün, 2010: p. 144). In a report published by the Organization for Economic Development and Cooperation (OECD) in 2023, schools aim at the emotional and social development of their

students, but do not include them in their activities. Moreover, they do not perform measurement and evaluation procedures for this. Although it is thought that the measurement evaluation of affective field gains is difficult, there are actually many methods and techniques for measuring and evaluating these gains (Bacanlı, 2006: p. 103; Turgut and Baykul, 2015: p. 331).

The main purpose of this research is to determine the opinions of prospective teachers about the hidden curriculum and to examine these opinions in terms of various variables. In this research, which is carried out in a sequential descriptive pattern in a mixed approach, the sub-objectives of the research, which are considered in two different dimensions, qualitative and quantitative, are as follows:

Objectives related to the quantitative dimension

1. Is there a significant difference in prospective teachers' opinions about the hidden curriculum according to the gender variable?
2. Is there a significant difference in prospective teachers' views about the hidden curriculum according to the grade level variable?
3. Is there a significant difference in prospective teachers' opinions about the hidden curriculum according to the department variable?
4. What are the items with the highest and lowest averages in the hidden curriculum perception levels of prospective teachers?

Objectives related to the qualitative dimension

The aim of the qualitative dimension of the research is to determine the opinions of prospective teachers about the hidden curriculum and to determine the factors affecting them. In order to realize this purpose, a semi-structured interview form from qualitative data collection techniques was used. The research questions that meet the sub-objectives related to the qualitative dimension of the research are listed below:

1. What kind of situations do prospective teachers usually encounter in educational life within the scope of the hidden curriculum, and what are their views on these situations?
2. What are the opinions of prospective teachers about what their reaction is in a negative situation they encounter within the scope of the hidden curriculum and the ways they apply to correct this situation?
3. What are the opinions of prospective teachers about the power of the hidden curriculum to influence university students and to what level is this power?

The mixed purpose of the research

1. What kind of hidden curriculum perceptions do prospective teachers have?

## Methodology

### The Research Model

In this research, which aims to determine the opinions of prospective teachers about the hidden curriculum and to examine these opinions in terms of various variables, a mixed research model was used, in which quantitative and qualitative research patterns were used. As a pattern, an embedded (integrated) pattern was used, which allows quantitative data to be supported and explained (Yıldırım and Şimşek, 2016: p. 326). The single screening model, which is one of the general survey models in the quantitative dimension of the research (Karasar, 2014: p.79), and the phenomenological pattern was used in its qualitative dimension (Yıldırım and Şimşek, 2016: p.69).

### Study Group

The population of the research consists of 945 prospective teachers who are continuing their education in the 2<sup>nd</sup>, 3<sup>rd</sup> and 4<sup>th</sup> grades at the Faculty of Education of Fırat University. It is believed that prospective teachers studying in the 1<sup>st</sup> grade do not have a rich classroom and school atmosphere experience due to the fact that they have just started their studies at the educational institution. In order to obtain a valid and healthy data set, pre-service teachers who studied in the first grade were not included in the research. Since the aim of the research was to reach the entire universe, there was also no sample selection.

For the research group of the qualitative research, 27 prospective teachers were selected for 9 departments, including 1 prospective teacher from each grade level, based on volunteerism. Therefore, the maximum diversity sampling technique was used in the qualitative research sample selection. The demographic data of the prospective teachers participating in the quantitative and qualitative dimension of the research are given in Table 1.

**Table 1.** Demographic characteristics of the study group

The research dimension	Variable	Variable level	f	Percentage	Total	
Quantitative	Gender	Female	688	72,8	945	
		Male	257	27,2		
	Grade	2 <sup>nd</sup> grade	328	34,7		
		3 <sup>rd</sup> grade	334	35,3		
		4 <sup>th</sup> grade	283	29,9		
	Department	Guidance and Psychological Counselling		137		14,5
		Art Teaching		59		6,2
		Science Teaching		60		6,3
		Elementary Mathematics Teaching		101		10,7
		Preschool Teaching		113		12,0
		Primary School Teaching		120		12,7
		Social Studies Teaching		120		12,7
		Turkish Teaching		138		14,6
	English Language Teaching		97	10,3		
<b>Total</b>	<b>3</b>	<b>17</b>	<b>945</b>	<b>100</b>	<b>945</b>	
Qualitative	Gender	Female	18	66,7	27	
		Male	9	33,3		
	Grade	2 <sup>nd</sup> grade	9	33,3		
		3 <sup>rd</sup> grade	9	33,3		
		4 <sup>th</sup> grade	9	33,3		
	Department	Guidance and Psychological Counselling		3		11,1
		Art Teaching		3		11,1
		Science Teaching		3		11,1
		Elementary Mathematics Teaching		3		11,1
		Preschool Teaching		3		11,1
		Primary School Teaching		3		11,1
		Social Studies Teaching		3		11,1
		Turkish Teaching		3		11,1
	English Language Teaching		3	11,1		
<b>Total</b>	<b>3</b>	<b>17</b>	<b>27</b>	<b>100</b>	<b>27</b>	

688 female and 257 male prospective teachers participated in the quantitative dimension of the research. 328 prospective teachers from the 2<sup>nd</sup> grade, 334 from the 3<sup>rd</sup> grade and 283 from the 4<sup>th</sup> grade participated. 137 prospective teachers from the Department of Guidance and Psychological Counselling, 59 from Art Teaching, 60 from Science Teaching, 101 from Elementary Mathematics Teaching, 113 from Preschool Teaching, 120 from Primary School Teaching, 120 from Social Studies Teaching, 138 from Turkish Teaching, and 97 from English Language Teaching participated in the research. 18 female and 9 male prospective teachers participated in the qualitative dimension of the research. 9 prospective teachers from each grade level participated. 3 prospective teachers from each department participated in the research.

### Data Collection Tools

In order to obtain the quantitative data of the research, the "Hidden curriculum Scale", a reliable and valid scale developed by Akbulut and Aslan (2016), was used. The scale consists of 21 items and 3 sub-dimensions. Cronbach Alpha internal consistency reliability coefficients for the whole scale .88, for the sub-dimension of the content .84, for the sub-dimension of the learning-teaching process .87 and for the sub-dimension of the evaluation .61 have been found. In the current research, Cronbach Alpha internal consistency reliability coefficients for the whole scale .92, for the sub-dimension of the content .88, for the sub-dimension of the learning-teaching process .86 and for the evaluation sub-dimension .61 have been found. In the confirmatory factor analysis, the fit values of the three-dimensional model were found to be good ( $\chi^2= 844.57$ ,  $sd= 186$ ,  $RMSEA= .074$ ,  $NNFI=.94$ ,  $NFI= .94$ ,  $CFI= .95$ ,  $IFI= .95$ ,  $RFI= .93$ ,  $SRMR=.063$ ,  $CN=188.04$ ,  $IFI=0.95$ ,  $GFI=0.89$ ,  $AGFI=0.86$ ).

The scale was prepared in five-point likert style. The scale interval is "I Absolutely Agree", "I agree", "I am undecided", "I Disagree", "I Strongly Disagree". The "Absolutely agree" option on the scale corresponds to values between 4.21-5.00, "I agree" option corresponds to values between 3.41-4.20, "I am undecided" option corresponds to values between 2.61-3.40, "I disagree" option corresponds to values between 1.81-2.60 and "I strongly disagree" option corresponds to values between 1.00-1.80. One negative item on the scale was scored backwards. The necessary permissions have been obtained for the use of the scale from the researchers who developed the scale.

The "Hidden curriculum Interview Form" developed by the researchers was used to obtain the qualitative data set. The interview form was created by the researchers after the relevant literature was reviewed. Before starting the application of the research, an expert opinion was obtained in the field of educational sciences, an associate professor, two faculty members were interviewed in this context and the necessary corrections were made. The focus was on the intelligibility of the questions with 3 prospective teachers. In addition, additional explanations were made to the participants during the interview.

### Data Collection

The necessary permits have been obtained from the relevant institution in order to conduct the research. The researchers made the necessary explanations to the prospective teachers in the classroom environment, then distributed the data collection tools to the prospective teachers by hand, collected them in the same way after they were given the necessary time to fill in. One-on-one interviews were conducted with the students in order to collect qualitative data.

### Data Analysis

The data were analysed by the researcher using a computer-aided statistical package program. Firstly, the missing value analysis was performed on the data set and the lost data were not random (.000) were observed, so these data were not included in the analysis. Reverse coding of an item on the scale was

performed. Then, the reliability test was performed and the reliability coefficient numbers of the overall scale and each factor were determined. Then, a normality test was performed to determine whether the obtained data set was parametric or nonparametric. Since the group size is larger than 50 ( $50 < 945$ ), the Kolmogorov-Smirnov (K-S) test was used to make a decision about the normality of the distribution (Büyüköztürk, 2016). Since the skewness and kurtosis (skewness-kurtosis) values also give an idea about whether the data show a normal distribution in normal distribution evaluations, these values were also taken into account in the research. The skewness, kurtosis values and K-S test results of the data are given in Table 2.

**Table 2.** The Skewness-Kurtosis values of the scores and the results of the Kolmogorov-Smirnov test

Scale	N	Skewness	Kurtosis	P
<b>Total score of the scale</b>		1.20	2.07	.000
<b>Content</b>	945	.983	1.45	.000
<b>Learning - Teaching Process</b>		1.36	2.19	.000
<b>Evaluation</b>		.786	.916	.000

When Table 2 is examined, the values obtained in the K-S test are significant across the scale and in all sub-dimensions ( $p < .05$ ) has been seen. Therefore, it seems that the normality assumption is violated throughout the scale and in its three sub-dimensions. But since this condition is often observed in large samples, the skewness and kurtosis values, which are another criterion for determining the normal distribution, were examined. Tabachnick and Fidell (2013) indicate that the scores do not deviate much from the normal with a skewness and kurtosis value between  $\pm 1.5$ . George and Mallery (2003), on the other hand, indicate that a skewness and kurtosis value between  $\pm 2.0$  can be accepted for a normal distribution. West, Finch and Curran (1995: p. 60) stated that the kurtosis value for a normal distribution should be three and that this value can vary between two and four. It is observed that the total and sub-dimension, kurtosis and skewness values of the scale within the range of values accepted for normal distribution in the literature. By looking at these values, it can be said that the data show a normal distribution. For this reason, independent groups t test was used in the comparison of the scores obtained from the scale with two variables, and one-way analysis of variance was used in cases with more than two variables. Post-hoc tests were used to determine the source of the significant difference in the comparison of more than two variables. By looking at the results of the Levene test, the Welch test results were taken into account instead of Anova in cases where the variances were not homogeneous. From the post-hoc tests, the Games-Howell test was used when the equality of variances was achieved, and when it was not achieved, the Hochberg test was used because the number of samples in the groups was far from each other.

In the analysis of the qualitative data; content analysis was performed in accordance with the phenomenological pattern. The analysis of the data was carried out by the research team. Prospective teachers' opinions about the hidden curriculum have been turned into codes and these codes have been categorized within appropriate thematic groups. These codes and themes are presented visually through tables. In order to ensure the reliability of the research, direct quotations from the participants are included. In order to ensure the validity, the expert examination technique and detailed description strategies of Lincon and Guba (1985) were used (Akt. Yıldırım and Şimşek, 2016: p. 276).

### Findings

In this section, the analysis of the quantitative data obtained during the research process and the findings related to it are given.



Table 3. Comparison of hidden curriculum scores according to the gender of participants

Sub-dimension	Group	n	$\bar{x}$	sd	df	Levene	t	p
Content	Female	688	2,12	,669	943	F	-3,892*	0,000
	Male	257	3,35	,848		18,33		
Learning - Teaching Process	Female	688	1,80	,756	943	F	-3,343	0,001
	Male	257	2,03	,974		22,34		
Evaluation	Female	688	2,09	,713	943	F	-3,175	0,002
	Male	257	2,28	,857		9,106		
Total		945						

\*p&lt;0.05

According to the table in which the hidden curriculum perceptions of prospective teachers were examined according to gender variable, it is seen that there is a significant difference between male and female prospective teachers in the sub-dimensions of content ( $t_{943}=-3,892$ ;  $p<0.05$ ), learning -teaching process ( $t_{943}=-3,343$ ;  $p<0.05$ ) and evaluation ( $t_{943}=-3,175$ ;  $p<0.05$ ). When the average scores of the females' and males' groups are examined, it is seen that the differentiation in the sub-dimensions of content ( $\bar{x}=3.35$ ), learning -teaching process ( $\bar{x}=2.03$ ) and evaluation ( $\bar{x}=2.28$ ) is in favor of male prospective teachers.

Table 4. Comparison of the content score according to the grade of the participants

Sub-dimension	Grade	n	$\bar{x}$	sd	The source of the variance	Sum of squares	df	Mean of square	F	p	Difference
Content	2 <sup>nd</sup> grade	328	2,11	0,73	Between groups	2,950	2	1,475	2,783	0,062	-
	3 <sup>rd</sup> grade	334	2,19	0,74							
	4 <sup>th</sup> grade	283	2,25	0,69	Within groups	499,245	942	,530			
	Total	945	2,18	0,72	Total	502,194	944				

When the table is examined, it is seen that the scores of prospective teachers obtained in the content sub-dimension of the scale do not differ significantly according to their classes ( $F_{(2-942)}=2.783$ ;  $p>0.05$ ). While the group with the highest average in the content sub-dimension is the 4<sup>th</sup> grade prospective teachers ( $\bar{x}=2.25$ ), the group with the lowest average in this sub-dimension is the 2<sup>nd</sup> grade prospective teachers ( $\bar{x}=2.11$ ).

Table 5. Comparison of the learning - teaching process score according to the grade of the participants

Sub-dimension	Grade	n	$\bar{x}$	sd	The source of the variance	Sum of squares	df	Mean of square	F	p	Difference
Learning - teaching process	2 <sup>nd</sup> grade	328	1,83	0,83	Between groups	,826	2	,413	,602	0,548	-
	3 <sup>rd</sup> grade	334	1,90	0,85							
	4 <sup>th</sup> grade	283	1,85	0,77	Within groups	645,631	942	,685			
	Total	945	1,86	0,82	Total	646,456	944				

When the table is examined, it is seen that the scores of prospective teachers obtained in the learning -teaching process sub-dimension of the scale do not differ significantly according to their classes  $F_{(2-942)}= 602$ ;  $p> 0.05$ ). While the group with the highest average in the learning -teaching process sub-dimension is the 3<sup>rd</sup> grade prospective teachers ( $\bar{x}=1.90$ ), the group with the lowest average in this sub-dimension is the 2<sup>nd</sup> grade prospective teachers ( $\bar{x}=1.83$ ).

**Table 6.** Comparison of the evaluation score according to the grade of the participants

Sub-dimension	Grade	n	$\bar{x}$	ss	The source of the variance	Sum of squares	df	Mean of square	F	p	Difference
Evaluation	2 <sup>nd</sup> grade	328	2,18	0,76	Between groups	1,075	2	,538	,931	0,394	-
	3 <sup>rd</sup> grade	334	2,10	0,76							
	4 <sup>th</sup> grade	283	2,15	0,74	Within groups	543,766	942	,577			
	Total	945	2,15	0,75	Total	544,841	944				

When examining the table, it can be seen that the scores of prospective teachers in the evaluation sub-dimension do not significantly differ by class  $F_{(2-942)}= ,931$ ;  $p> 0.05$ ). The group with the highest average in the evaluation sub-dimension is the 2<sup>nd</sup> grade prospective teachers ( $\bar{x}=2.18$ ), while the group with the lowest average in this sub-dimension is the 3<sup>rd</sup> grade prospective teachers ( $\bar{x}=2.10$ ).

**Table 7.** Comparison of content sub-dimension scores by participants' department

Sub-dimension	Department	n	$\bar{x}$	sd	The source of the variance	Sum of squares	df	Mean of square	F	p	Difference (Games - Howell)
Content	Guidance and Psychological Counseling	13 7	1,95	0,58	Between groups	21,116	8	2,639	5,135	0,000	GPC-SST, TT, ELT
	Art Teaching	59	2,20	0,67							ST-ELT
	Science Teaching	60	2,05	0,59							PT -TT, ELT
	Elementary Mathematics Teaching	10 1	2,18	0,67							SST-GPC
	Preschool Teaching	11 3	2,05	0,58	TT-GPC, PT						
	Primary School Teaching	12 0	2,16	0,85	Within groups	481,078	936	,514			ELT-GPC, ST, PT

Social Studies Teaching	120	2,25	0,74			
Turkish Teaching	138	2,36	0,75			
English Language Teaching	97	2,42	0,86			
<b>Total</b>	<b>945</b>	<b>2,18</b>	<b>0,72</b>	<b>Total</b>	<b>502,194</b>	<b>944</b>

Levene= 3,691 p= 0,000

\* Since the condition of homogeneity of variances could not be met, the results of the welch test, not anova, were taken into account.

When the table is examined, it is seen that the prospective teachers' scores obtained in the content sub-dimension of the scale differ significantly according to their department  $F_{(2-942)}= 5.135$ ;  $p 0.05$ ). It is seen that the differentiation in content scores of prospective teachers is between Guidance and Psychological Counselling and Social Studies Teaching, Turkish Teaching, English Language Teaching; Science Teaching and English Language Teaching; Preschool Teaching and Turkish Teaching, English Language Teaching; Social Studies Teaching and Guidance and Psychological Counselling; Turkish Teaching and Guidance and Psychological Counselling, Preschool Teaching; English Language Teaching and Guidance and Psychological Counselling, Science Teaching, Preschool Teaching departments' prospective teachers. The group with the highest average in the content sub-dimension is the English language prospective teachers ( $\bar{x}=2.42$ ), while the group with the lowest average in this sub-dimension is the Guidance and Psychological Counselling prospective teachers ( $\bar{x}=1.95$ ).

**Table 8.** Comparison of the learning -teaching process sub-dimension score according to the section of the participants

Sub-dimension	Department	n	$\bar{x}$	sd	The source of the variance	Sum of squares	df	Mean of square	F	p	Difference (Games - Howell)
The learning-teaching process	Guidance and Psychological Counselling	137	1,72	0,60	Between groups	23,667	8	2,958	4,446	0,000	GPC-ELT
	Art Teaching	59	1,91	0,72							ST-ELT
	Science Teaching	60	1,73	0,59							EMT - ELT
	Elementary Mathematics Teaching	101	1,80	0,79							PT-TT, ELT
											TT-PT
											ELT-GPC, ST, EMT, PT

Preschool Teaching	113	1,68	0,65						
Primary School Teaching	120	1,87	0,94						
Social Studies Teaching	120	1,86	0,96						
Turkish Teaching	138	1,99	0,86	Within groups	481,078	936	,665		
English Language Teaching	97	2,23	0,95						
<b>Total</b>	<b>945</b>	<b>1,86</b>	<b>0,82</b>	<b>Total</b>	<b>646,456</b>	<b>944</b>			

Levene= 4,597 p= 0,000

\* Since the condition of homogeneity of variances could not be met, the results of the welch test, not anova, were taken into account.

When the table is looked at, it is seen that the prospective teachers' scores obtained in the learning-teaching process sub-dimension of the scale differ significantly according to their sections  $F_{(8-936)}= 4.446$ ;  $p < 0.05$ ). It is seen that the differentiation in content scores of prospective teachers is between Guidance and Psychological Counselling and English Language Teaching; Science Teaching and English Language Teaching; Elementary Mathematics Teaching and English Language Teaching; Preschool Teaching and Turkish Teaching, English Language Teaching; Turkish Teaching and Preschool Teaching; English Language Teaching and Guidance and Psychological Counselling, Science Teaching, Elementary Mathematics Teaching, Preschool Teaching departments' prospective teachers. The group with the highest average in the learning -teaching process sub-dimension is English prospective teachers ( $\bar{x}=2.23$ ), while the group with the lowest average in this sub-dimension is preschool prospective teachers ( $\bar{x}=1.68$ ).

**Table 9.** Comparison of the evaluation sub-dimension score according to the department of the participants

Sub-dimension	Department	n	$\bar{x}$	sd	The source of the variance	Sum of squares	df	Mean of square	F	p	Difference (Hochberg)
Evaluation	Guidance and Psychological Counselling	137	2,03	0,70	Between groups	20,443	8	2,555	4,561	0,000	GPC-ELT
	Art Teaching	59	2,03	0,72							ST-ELT
	Science Teaching	60	2,06	0,68							EMT-ELT
											PT-ELT

Elementary Mathematics Teaching	10	2,00	0,68					SST-ELT
Preschool Teaching	11	2,07	0,70					ELT-GPC, AT, ST, EMT,
Primary School Teaching	12	2,17	0,80					PT, PST, SST
Social Studies Teaching	12	2,11	0,80					
Turkish Teaching	13	2,28	0,74					
English Language Teaching	97	2,50	0,82					
<b>Total</b>	94	2,15	0,75	<b>Total</b>	544,084	944		
	5				1			
				Within groups	524,399	936	,560	

Levene= 0,852 p= 0,000

When the table is examined, it is seen that the prospective teachers' scores obtained in the evaluation sub-dimension of the scale differ significantly according to their sections  $F_{(8-936)}= 4.561$ ;  $p < 0.05$ ). It is seen that the differentiation in content scores of prospective teachers is between Guidance and Psychological Counselling and English Language Teaching; Science Teaching and English Language Teaching; Elementary Mathematics Teaching and English Language Teaching; Preschool Teaching and English Language Teaching; Social Studies Teaching and English Language Teaching; English Language Teaching and Guidance and Psychological Counselling, Art Teaching, Science Teaching, Elementary Mathematics Teaching, Preschool Teaching, Primary School Teaching, Social Studies Teaching departments' prospective teachers. The group with the highest average in the evaluation sub-dimension is prospective English language teachers ( $\bar{x} = 2.50$ ), while the group with the lowest average in this sub-dimension is prospective mathematics teachers ( $\bar{x} = 2.00$ ).

**Table 10.** The highest and lowest averages in the hidden curriculum perception levels

Level	Items	$\bar{x}$	sd
The highest	21. Faculty members specify the criteria they will evaluate before the exam or homework.	2,84	1,27
	1. During the course, faculty members criticize ideas that are not compatible with their own ideologies.	2,79	1,16
	3. Faculty members criticize books that contradict their own ideas.	2,61	1,13
The lowest	11. During the course, faculty members give some students more say due to financial income, family and social opportunities.	1,63	,93
	10. Faculty members give higher grades to some students due to income, family and social opportunities.	1,68	1,02
	13. During the course, faculty members provide tolerance to students who have the same opinion as themselves, allowing them to pass the course without studying	1,73	1,00

Within the scope of the scale, prospective teachers most often stated that lecturers are exposed to the hidden curriculum in relation to the uncertainty of the evaluation criteria (reverse item). This is followed by

teachers criticizing ideas and books that contradict their own ideologies. Within the scope of the scale, the situations in which prospective teachers are least exposed to the hidden curriculum are; it is that faculty members give students the right to speak and grade in terms of their demographic characteristics, and it is that they give tolerance to students who agree with them and pass them without studying.

**Qualitative Findings**

Regarding the hidden curriculum, prospective teachers were examined under 3 main headings: what kind of situations they encountered within the scope of the hidden curriculum, their reactions to the negative situations they encountered within the scope of this curriculum and the solutions they created, their views on the power of the hidden curriculum to affect them. The findings obtained are visualized through the tables. Direct quotations from the participants are included to ensure reliability.

Abbreviations were used for the demographic information of the prospective teachers. PT-1 for the numbers given to prospective teachers; F for female teachers, M for male teachers, g next to the grade levels for their classes, were put. The abbreviations GPC for Guidance and Psychological Counselling department, AT for Art Teaching, ST for Science Teaching, EMT for Elementary Mathematics Teaching, PT for Preschool Teaching, PST for Primary School Teaching, SST for Social Studies Teaching, TT for Turkish Teaching and ELT for English Language Teaching were used. The situations that prospective teachers encounter within the scope of the hidden curriculum and their opinions about these situations are given in Table 11.

**Table 11.** The views of prospective teachers on the situations they faced within the scope of the hidden curriculum

Category	Subcategory	Views	Sub-views	f	Total
Situation	Faculty member	Opinions/ideologies	Chat, memory, experience, current events, environmental examples	17	55
			Attitude	Right to have a say, discrimination, fairness, equal treatment, openness to criticism, nice attitude, controllability	
		Evaluation	Unclear evaluation criteria	2	
	Educational situations	School activities	Interview, conference, trip	6	
		Limited events	Pandemic impact, material, environmental conditions, burden of responsibility	4	
		Inequality of opportunity	Pandemic, general	4	
		Cultural transfer	Cultural elements, moral principles, social issues	4	
	Student	Individual	Social activities, reflection with art, videos, movies, books, ideological thoughts, opinions	6	
		Friendship	Othering, grouping, peer bullying, relationships	4	
	Attitude	Cognitive	Attitude	Disadvantage, stereotypical informative, enrichment	

		Application	Non-imposition, not going out of class, showing sensitivity	5	
	Behavioural	Behavioural	Avoiding polemics, ensuring interaction	2	
	Affective	Affective	Finding nice/beautiful, keeping it alive	3	
Total	6	13	13	75	75

\*Since prospective teachers express more than one opinion in more than one category and in one category, the number of opinions may be higher than the number of participants.

The situations that prospective teachers encountered within the scope of the hidden curriculum and their opinions about them were examined in two separate categories, namely, situation and attitude. In the status category, the situations arising from the faculty member, educational situations and the student are given. In cases arising from the faculty member, the conversation in which the faculty members stated their opinions and ideologies; memory; experience; current events and examples they gave from the environment are included.

In the attitude category, the hidden curriculum elements that arise through the attitudes of faculty members are mentioned. In this context, positive and negative opinions such as not giving students enough or no say, discrimination among students, faculty members being fair and egalitarian in the classroom, being open to criticism, adopting a pleasant attitude towards the student and passing the course under the control of the faculty member were included.

In cases arising from educational situations, prospective teachers stated that they participated in school activities such as interviews, conferences, trips. Prospective teachers expressed the opinion that school activities are insufficient or limited due to reasons such as pandemic effect, financial insufficiency, environmental conditions and the burden of responsibility imposed by activities. In cases caused by the student, prospective teachers stated that they participated in social activities, were involved in the hidden curriculum by watching videos/movies or reading books. A prospective teacher stated that the hidden curriculum reflects the world of emotions and thoughts she forms into the pictures it makes, and thus affects the hidden curriculum her own.

The attitude category has been examined under three headings: cognitive, behavioural and affective. In the cognitive category, pre-service teachers stated that they found the situations they encountered disadvantageous and that stereotypical ideas were transmitted. Again, in the same category, prospective teachers stated that they found the hidden curriculum situations they encountered informative and useful; these enriched the worlds of thought and emotion. In the attitudes of prospective teachers towards the application of the cognitive category, prospective teachers stated that they should avoid imposition, avoid going out of class and show sensitivity on such issues when conveying the opinions of faculty members.

Regarding behavioural attitudes, pre-service teachers stated that they avoid polemics in hidden curriculum situations and that hidden curriculum situations provide interpersonal interaction. Regarding affective attitudes, prospective teachers expressed the opinion that they found the situations they encountered pleasant and nice, and that such situations kept the lesson alive.

Referring to the opinions of faculty members and social events, a prospective teacher (PT12, GPC, 3g, M) expressed his opinion by saying *"I have encountered the opinions and attitudes of faculty members about life experiences, experiences, information related to daily life, current issues. In addition to these, I also participated in events*

such as interviews, conferences, trips. I think these events are very insufficient in terms of number. One of the reasons for this may be a pandemic.” Referring to friendship relations, a prospective teacher (PT-12, EMT, 4g, F) said, “In general, I have witnessed examples of grouping and excluding among students. While the faculty members instil their own ideas, they also try to show an attitude that is open to criticism.” Emphasizing that ideological thoughts should not be imposed, a prospective teacher (PT-25, ELT, 2g, K) expressed his thoughts by saying “Sometimes we can face situations where people talk about their own ideologies. It should be said, but I think it should be said without very sharp lines and imposing this on people.”

The opinions of the prospective teachers regarding their reactions to the negative situations they encountered within the scope of the hidden curriculum are given in Table 12.

**Table 12.** Views of prospective teachers on their reactions to negative situations

Category	Sub-Category	Views	f	Total
Reaction	A way out	Self-expression, taking care of yourself, exchange of ideas, research/understanding, search for solutions, CIMER	18	43
	Applicants	Authorized/interested person, faculty member, consultant, head of department, dean	17	
	Reaction techniques	Constructive criticism, observation, discussion, explanation	5	
	Reaction criteria	Impact value, state of interest, invariance	5	
Attitude	Attitude	Hopelessness, abstention, respect/dialogue, proper style, calm, caution, fear of confrontation, optimism	14	14
Unresponsiveness	Unresponsiveness	Silence, isolation, fear of confrontation, despair	11	11
Total	6	6	58	58

Prospective teachers' opinions about their reactions to negative situations they encountered within the scope of the hidden curriculum were examined within the categories of reaction, attitude and unresponsiveness. As a way of solution in the reaction category, prospective teachers expressed their opinion that they express themselves directly, solve the problem on their own, exchange ideas, try to understand the situation at the first moment, research the situation, try to create a solution, and if they can't solve it, write to CIMER (Presidential Communication Center). They stated that the people they applied to were an authorized or related person, the faculty members themselves, their advisors, the heads of departments and the dean.

The reaction techniques used by prospective teachers in the face of negative situations are to make constructive criticisms, to make observations, to enter into discussions and to make explanations. Prospective teachers stated that they react according to certain criteria in relation to the negative situations they encounter. These criteria are the size of the influencing power of the negative situation, the invariance of the result, and whether the negative situations affect themselves. They stated that they react if the negative situation has a high influencing power or if the negative situation affects them. They also stated that they reacted according to the criterion of whether the result changed in the reaction state.

Prospective teachers stated that they adopted a desperate attitude that they could not change the result in the negative situations they faced, that they abstained for fear of confrontation with faculty members and



for other reasons. They also stated that the prospective teachers entered into the dialogue respectfully regarding the positive attitudes they adopted in the negative situations they faced, used a proper style, remained calm, and acted carefully in the face of the situation. They stated that since these positive attitudes help them to overcome the negative situation, they adopt an optimistic attitude to change the negative situation. In the category of unresponsiveness, prospective teachers expressed that they were unresponsive in the face of negative situations of the hidden curriculum and isolated themselves from the environment because they adopted a hopeless attitude about the fear of confrontation with faculty members and the immutability of the result.

A prospective teacher (PT-21, SST, 4g, M) said, *"I don't react or make an effort to correct. I have no faith that I can change the situation."* by saying that, he has shown that he has adopted a desperate attitude towards the negative situation. A prospective teacher (PT-7, ST, 2g, M) who applies for consultant support in adverse situations says *"My reaction is usually to be calm and careful. I will investigate the causes of the negative situation and find a solution according to him. I get support from my consultant teacher to solve the problem."* Another prospective teacher PT-17, PST, 3g, F) mentioned the reaction techniques he uses by saying *"When I encounter a negative situation, I take into account the environment and conditions directly and react accordingly. I make constructive criticism. The ways I refer to are discussion, explanation."*

Prospective teachers' views on the power of the hidden curriculum to affect university students were examined under three categories: effective, ineffective/weak and relative. The opinions of the prospective teachers stated in these categories are given in Table 13.

**Table 13.** Prospective teachers' views on the power of the hidden curriculum to influence

Category	Sub-category	Views	Sub-views	f	Total	
Effective	Domain	Psychological	Motivation, interest, attention, self-confidence, psychological pressure, consciousness, assertiveness, psychological influence, power of expression	21	78	
			Social	Communication, interaction, socialization, exchange of ideas, social values, political values, moral values		21
				Education		Commitment to the lesson, school attendance, willingness to learn, permanent learning, professional preparation, cooling off from the lesson, adaptation to school, cognitive effect
		Individual	Worldview, mentality, destruction of mold thoughts, imposing opinions	4		
		Quality of influence	Quality of influence	Hidden effect, indirect effect, complementary effect, critical effect, high effect		18
		Result of influence	Impact Result	Guidance, sampling, blocking		4

Ineffective/weak	Weak	Weak	Insufficient activity, mature students, critical system, critical listener, reasoning ability, idealistic ideas, poor impact, low impact	20	22
	Ineffective	Ineffective	Insufficient activity, mature students, idealistic ideas	2	
Relative	The affected variable	Person	It depends on the person	4	9
		curriculum	More effective than other curriculum	3	
		Level	Less effective than primary and secondary education levels	2	
Total	6	11	11	109	109

Prospective teachers shared 78 opinions about the effect of the hidden curriculum on university students. These opinions were examined under the categories of domain, quality of influence and result of influence. The areas of influence are divided into 4 categories: psychological, social, educational and individual. Prospective teachers stated that the hidden curriculum positively affects the motivation, interest, attention and self-confidence of university students. They said that the hidden curriculum makes university students more conscious and assertive, increases their potential to express themselves. They also stated that the hidden curriculum affects students psychologically and arouses psychological pressure. Nine opinions have been reported on the psychological impact of the hidden curriculum on university students.

Ten opinions on the social impact of the hidden curriculum on university students were reported. Prospective teachers expressed the opinion that the hidden curriculum provides interaction and communication between students, allows them to socialize and exchange ideas. They stated that social, political and moral values are transferred through the hidden curriculum. Prospective teachers stated that the hidden curriculum affects the worldview and mentality of students, breaks down their thoughts and imposes ideas through the hidden curriculum in the individual dimension.

Regarding the nature of the effect of the hidden curriculum, prospective teachers stated that the effect of the hidden curriculum is hidden and indirect. They declared that the effect of the hidden curriculum is critical and high, and it is complementary to other curriculum. As a result of the effect of the hidden curriculum, prospective teachers stated that students took the example of faculty members through the hidden curriculum, pushed students to wrong or correct directions, and that the hidden curriculum could interfere with some positive characteristics that students have.

Prospective teachers stated that due to the pandemic and other reasons, the number of activities conducted both at school and in social life is insufficient, so the effect of the hidden curriculum is low. In addition, they stated that the effect of the hidden curriculum on students is weak or low due to the fact that students who have reached the university level are now mature, have their own ideas and reasoning abilities, the university environment allows for the criticality of ideas, and students are critical listeners. Some prospective teachers, on the other hand, have stated that the hidden curriculum is completely ineffective for the same reasons.

Prospective teachers stated that the effect of the hidden curriculum varies according to the person, curriculum and teaching level. Prospective teachers stated that the direction and level of the hidden curriculum's impact on students may vary from person to person, and the hidden curriculum affects students

more than other types of curriculum. In addition, they stated that the effect of the hidden curriculum is greater in primary and secondary education compared to higher education.

A prospective teacher (PT-15, PT, 4g, F) who thinks that the hidden curriculum does not have an impact on university students supported his opinion by saying *"I don't think the hidden curriculum will have an impact because university students are adults who determine their own idealism. In general, the ideas of university students are formed, they do not change. I also don't think there are enough social events being held."* Another prospective teacher (PT-13 PT, 2g, F) who mentioned the effect of the hidden curriculum on fixed thoughts said, *"I think that individuals who have reached the university level have more fixed thoughts and it is more difficult to change them, but with the hidden curriculum, students can be made to question and perhaps change their own ideas."* Comparing the hidden curriculum with other types of curriculum, another prospective teacher (PT-9, ST, 4g, F) said, *"Universities are at a high level for socialization. Students are influenced by each other. They try to impose their own views. The effect of the hidden curriculum on students is greater than other curriculum. The hidden curriculum can affect students positively or negatively."*

### Conclusion, Discussion and Recommendations

In the research, it was found that the hidden curriculum perceptions of male prospective teachers were higher than those of female teachers in all three sub-dimensions. In the comparison made according to the grades of the prospective teachers, no significant differences were found in all sub-dimensions. In Duran's (2023) research, it was found that the hidden curriculum perception level of prospective teachers in upper grades was higher. In the research of Orgun, Özkütük and Akçakoca (2019), as the grade level increased, the hidden curriculum perception also increased. In the same research, male students' perception of hidden curriculum was higher than female students. In the comparison made according to the department studied by the prospective teachers, significant differences were found in all sub-dimensions. In Duran's (2023) research, the hidden curriculum perceptions of prospective teachers were higher than those of female prospective teachers.

English Language Teaching department was the department with the highest hidden curriculum perception in the content sub-dimension of the comparison made by the prospective teachers according to the department they studied, and a significant difference was found between Guidance and Psychological Counselling, Science, Preschool Teaching departments. Guidance and Psychological Counselling was found to be the lowest department with hidden curriculum perception and a significant difference was found between Social Studies, Turkish and English Language Teaching departments. In other departments, significant differences have also been reached between them.

Significant differences were found in the sub-dimension of the learning -teaching process according to the department studied Preschool Teaching teachers. The English teaching department was identified as the department with the highest hidden curriculum perception, and a significant difference was found between the Guidance and Psychological Counselling, Mathematics, Science, Preschool departments. Preschool Teaching was found to have the lowest hidden curriculum perception, and a significant difference was found between them and the Elementary Mathematics Teaching and English Language Teaching departments.

Significant differences were also found in the evaluation sub-dimension according to the department that the prospective teachers studied. The English Language Teaching department was identified as the department with the highest hidden curriculum perception and a significant difference was found between the Guidance and Psychological Counselling, Art Teaching, Elementary Mathematics Teaching, Science, Preschool, Primary School Teaching, and Social Studies departments. Elementary Mathematics Teaching department was found to have the lowest hidden curriculum perception and there was a significant difference

between the department of English Language Teaching. In Duran's (2023) research, the level of hidden curriculum perception of prospective teachers also showed differences according to departments.

Within the scope of the scale, prospective teachers most often stated that lecturers are exposed to the hidden curriculum in relation to the uncertainty of the evaluation criteria (reverse item). This is followed by teachers criticizing ideas and books that contradict their own ideologies. Within the scope of the scale, the situations in which prospective teachers are least exposed to the hidden curriculum are; it is that faculty members give students the right to speak and grade in terms of their demographic characteristics, and it is that they give tolerance to students who agree with them and pass them without studying. Akbulut and Aslan (2016) stated that hidden curriculum awareness increased as the total score obtained from the scale increased. Accordingly, when looking at these findings, it can be said that the hidden curriculum is felt more intensely in these 3 items where it has the highest average. The items with the lowest average of the research and the items with the lowest average of Orgun, Özkütük and Akçakoca's (2019) research are the same. In the same research and Duran's research (2023), the 1<sup>st</sup> and 21<sup>st</sup> items with the highest average turned out to be the same. In Duran's (2023) research, the 10<sup>th</sup>, 11<sup>th</sup> and 13<sup>th</sup> items with the lowest average also turned out to be exactly the same.

One of the hidden curriculum elements that prospective teachers feel the most intensely is that the evaluation criterion is unclear, which constitutes one of the negative effects of the hidden curriculum. On the other hand, the items with the highest average that faculty members criticize ideas and course content that contradict their own ideologies can be considered among the neutral, positive or negative effects of the hidden curriculum due to factors such as critical environment, critical listener, mature individuals expressed by prospective teachers in the qualitative dimension of the research. The nature of this effect may differ due to unrelated variables that have not been controlled.

The hidden curriculum items that prospective teachers are least exposed to are that faculty members conduct courses and assessment-evaluation activities according to the demographic characteristics of prospective teachers, such as financial income, family. At the same time, it is the recognition of tolerance to students who feel close to him mentally. All three of these items have the negative effects of the hidden curriculum, and although it is ethically desirable to have a low average, it can also be said that it contradicts the official curriculum in the opposite case.

In the research, it was concluded that prospective teachers have extracurricular conversations with faculty members, encounter positive and negative attitudes of faculty members in the classroom, evaluation criteria are unclear, social activities are limited for various reasons, morality and social norms are transferred to them within the scope of the hidden curriculum. As a result of the research, it was found that prospective teachers find the situations they encounter within the scope of the hidden curriculum natural and positive, provided that there is no imposition, sensitive treatment, and not going out of class. Prospective teachers believe that hidden curriculum elements provide interaction, and they generally avoid conflict.

As a result of the research, it has been seen that prospective teachers develop three different types of reactions in the face of negative situations. These are; staying silent due to despair or fear, entering into a dialogue with an appropriate style, and contacting the authorities. Reacting by looking at the impact value or continuity of the problem is also among the results reached.

As a result of the research, it was concluded that a group of prospective teachers found that the hidden curriculum affected them socially and psychologically. Prospective teachers think that hidden elements affect themselves in their education and individual lives. Prospective teachers believe that the hidden curriculum increases their attention, self-confidence, interest and motivation, provides socialization. Prospective teachers

think that this effect is hidden and indirect, as well as that the critical and impact value is high. They think that this effect directs them according to the situation or hinders them in some matters.

A group of prospective teachers believe that the effect of the hidden curriculum is weak or completely ineffective due to insufficient activities, the fact that university students are mature individuals with advanced reasoning abilities, have idealistic ideas, listen critically, and the system is open to a critical structure. Another group of prospective teachers believes that the effect of the hidden curriculum is relative. According to these prospective teachers, the effect of the hidden curriculum varies from person to person. The hidden curriculum is more effective than the official curriculum. The hidden curriculum is more effective at primary and secondary education levels than higher education.

Some of the codes and categories reached as a result of the research show similarities with the codes and categories obtained by Öztürk and Taşpınar in the meta-analysis research (cultural capital, ideological transmission, teacher behaviour, attitude) (2021: p. 266). The results of discrimination, the hidden influence of the socio-economic structure of the school on the hidden curriculum and the transfer of values by teachers obtained in the same research also show similarities with the research. In Bergenhenegouwen's research, although one group of students specifically avoided getting into conflict with teachers, another group stated that expressing their own thoughts was more important than getting a good mark (1987: p. 538). This situation is in parallel with the results of the current research.

Özaslan (2019: p.145) in his research, he concluded that most of the prospective teachers were able to establish a healthy relationship with the faculty members, and that the faculty members were open and sincere to extracurricular communication. In this research, it was also found that the faculty members did not discriminate among the prospective teachers, adopted a rote educational approach to them, the characteristics of being democratic outweighed, and the extra curriculum activities were incomplete or insufficient. These results are in parallel with the research findings. Coşkun, (2016: p. 238) in his research with prospective teachers, he concluded that they take faculty members as role models. Kumral's (2009: p. 98) the results of communication with faculty members and sharing their experiences reached in his research with prospective teachers show similarities with the current research. Tuncel (2007: p. 62) concluded in his research that students develop a positive or negative attitude towards the lesson by being emotionally affected by the behavior of the teaching staff within the scope of the hidden curriculum.

Demirel's (2014: p. 7) views are also in parallel with the results of the research. Demirel stated that the hidden curriculum is effective at all levels of education, affects the cognitive skills of students and is at least as effective as other educational curriculum. Nevertheless, he stated that the hidden curriculum is neglected by educators in educational settings. Türedi (2008) stated in her research that, similar to the results of the current research, the hidden curriculum is used as a tool to convey the dominant culture and ideology. In the research of Çobanoğlu and Engin Demir (782), it was concluded that the effect of the hidden curriculum on students can be positive or negative. Although it occurs mostly through undemocratic practices in Turkey, it has been emphasized that students have developed appropriate strategies to cope with such negative situations. These results are similar to the results of the current research.

Based on the results of the research, the following recommendations have been developed.

- Guidance activities should be organized to give students awareness of the negative effects of the hidden curriculum.
- Educational studies should be carried out so that faculty members can use the hidden curriculum more effectively and efficiently and take it under control.

- Guidance studies should be carried out in order for faculty members to gain self-awareness about the hidden curriculum they are applying and to be able to conduct self-criticism.
- The higher education institution should take more actions to objectively measure and evaluate the outputs of the hidden curriculum.
- The study groups of academic studies related to the hidden curriculum should be diversified and enriched.
- The data collection tools used in academic studies related to the hidden curriculum should be diversified and enriched.

**Ethics Committee Approval:**

This research was carried out in accordance with the permission of the ethics committee dated 29.07.2020 and numbered 97132852/302.14.01/ document obtained from the Ethics Committee of Social and Humanities Research of Fırat University.

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# Instructional Adaptations and Professional Development with Different Approaches: Preschool Teachers in Turkey\*

Research Article

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## ABSTRACT

Preschool education, which is equivalent to the first six years of early childhood, is a critical education stage that offers the opportunity to support mathematical, theoretical, social, emotional, language, motor, and self-care development. It is the most suitable stage for the distribution of children's development. The integration/integration application naturally prevents the exclusion of the child in and out of the classroom and ensures their social development. At the same time, it is also prominent in determining the need for restructuring according to the parts showing developmental delay or deficiency in different areas and in meeting these developments. As it is included in different applications and intervention programs regarding educational adaptations, a successful education process is undoubtedly not a single fragmentary teacher, program or special purpose child. Although the teacher process is an important device, the program features, order, the school administrator's program and the officers working in the same period will need to be filled in this process. In addition to this situation, the physical conditions of the classroom, the environment included in the education and the socioeconomic status will also guide the planning style of teaching activities. The family's perception of care, the information and methods of other families regarding special education are equally important. Considering this product in all its products, communicating and marketing it in a market is valuable in terms of achieving satisfactory growth.

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### Keywords:

Current issues in early childhood education, teaching adaptations, educational methods in preschool education, professional development

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## **Introduction**

Preschool education, which corresponds to okul the first six years of early childhood, is a critical education stage that offers the opportunity to support the child's cognitive, social-emotional, language, motor and self-care development areas. This stage can be developed by supporting the developmental areas in which normally developing children show deficiencies, and it is also the most suitable stage for supporting the development of children with special needs. The practice of inclusion/integration supports the social development of the child by naturally preventing him/her from being excluded inside and outside. At the same time, since it can be restructured according to children who show developmental delays or deficiencies in different areas, it also stands out in determining needs and meeting these needs (Demirbilek and Levent, 2020). In addition to making it easier for normally developing children to live with differences, this situation also allows them to learn by experiencing peer interaction in a much richer learning environment (Bredenkamp, 2015; UNESCO, 2005).

Teachers' needs in this direction require practical solutions in terms of transferring theory to practice. When the common approaches in the world are examined, it is seen that teachers mostly benefit from support through guidance with the highest efficiency (McCollum, Hemmeter, & Hsieh, 2013; Onchwari & Keengwe, 2010). It is seen that there are studies on the use of various methods in classroom environments (McBride & Schwartz, 2003; Schepis, Reid, Ownbey, & Parsons, 2001) and on working with children with autism (Strain & Bovey, 2011; Wilson, Dykstra, Watson, Boyd, & Crais, 2012). Based on existing studies, the frequency of use of instructional adaptations in inclusive classrooms in younger age groups is remarkable because they are flexible, practical, and observable.

### **Instructional Adaptations in the Preschool Curriculum**

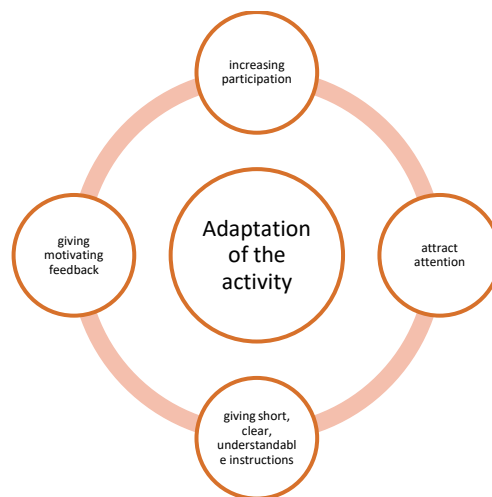
In all educational programs created in our country to date, the protection of the right to education of individuals with special needs has been taken as a basis. In this context, educational adaptations that are put into practice so that children with special needs receive the highest benefit during the education process together with their peers also appear under different headings in the program (MEB, 2013). With the publication of the 2013 Pre-School Education Program, the necessity of making plans for children with special needs in pre-school education has been explained within the scope of plan formats. In this program, the statement "Includes adaptations for children with special needs" was included under the title of basic features of the program. In addition, there is an evaluation heading in the Pre-School Education Program Monthly Education Plan Format of the Ministry of National Education. Evaluations to be made at the end of the month are generally made in terms of child, program and teacher dimensions by taking daily evaluations into consideration. There is an adaptation heading in the "Pre-School Education Program Activity Plan Format" of the Ministry of National Education. Under this heading, it has been stated that teachers who have children with special needs in their classes in should write down the arrangements to be made in the implementation of this activity, the materials used and the learning process, and the points to be considered. Again in the same way; In the current program, children with special needs are grouped according to their developmental disabilities and separate recommendations are made for each group. This section includes detailed explanations from the adaptation of activities to the materials to be used. Although there is no specific heading regarding the educational environment, information regarding the role of the learning environment in the process is also included under these headings. In this context, it is possible to say that the preschool education program attaches importance to, encourages and provides guidance for the inclusion of children with special needs in the learning process (MEB, 2013).

This incentive initiated by the preschool education program has been expanded with scientific studies conducted on this subject. In the academic studies conducted during the same period, the adaptation process has been brought to a simpler form for teachers to understand (Temiz and Rakap-Parlak, 2018). When the

studies conducted between 2000-2024 within the scope of the current research are grouped in general, the titles of adaptation of the activity, adaptation of the learning environment and adaptation of teaching methods and techniques are encountered..

### Event Adaptation

The title of activity adaptation was created based on the preschool education program. Under this title, the revision of the achievements and indicators under the program title according to the needs of the child with special needs is taken as a basis (Özdemir, 2010). In activity adaptation, it is important for the teacher to monitor the child's development, make plans and adapt it to the daily flow in a practical way in determining the quality of the activity adaptation (Metin, 2013). Sandall and Schwartz (2014, p. 56), who adopt a contemporary approach to educational adaptations, have adopted a more practical approach in this regard. In this direction, it is desired for children to be informed about the program as much as determining the child's interest and preparing the program. Creating the program in visual forms rather than written according to the child's developmental characteristics, increasing the font size and hanging it at the child's eye level are also important details. Charts and programs are very important auxiliary materials in children's understanding of the process and effective use of time (McClannahan and Krantz, 1999). Studies have shown that using schedules for adults has a positive effect on self-regulation and increases the productivity level of the individual. In this context, schedules and programs can also be used for school personnel.



**Figure 1.** Stages of Adaptation of the Activity (Sandall and Schwartz, 2014)

Sandall and Schwartz (2014) emphasized that activities can be expanded with unlimited variations, provided that the items mentioned above remain constant. However, there are also different intervention methods for adaptation. Atkin (2013) stated that in addition to simplifying the activity; additional teaching objectives can be determined or teaching can be differentiated.

Approaches such as dividing the activity into stages (dividing), giving clear instructions or counting certain sections as completed according to the areas the child has difficulty with will also support the highest participation of the child with special needs (Sandall and Schwartz, 2014, pp. 68-70). Orkwis and McLane (1998) have drawn attention to some developmental characteristics in this process, which we can generally call intervention. They have drawn attention to the fact that the simplification of the activity should also include skills such as seeing, hearing, speaking, moving, reading, writing, understanding, participating, organizing and remembering. In other words; while simplifying, the teacher should not only show flexibility in the areas the child has difficulty with sırabut also make an effort to develop the areas he has difficulty with. This effort should not be at a level that is challenging and demotivating for the child with special needs; it should progress at the child's pace.

*Are activities the only learning tools in an inclusive preschool classroom?*

Successful transitions to an inclusive classroom are very valuable in terms of providing natural learning. Teachers can use transitions within the classroom to support participation by ensuring that children participate in more activities and continue participation, and thus to make adaptations in the activity. In the literature, transitions within the classroom are defined as “changes or mobility within the classroom made by the teacher to complete a task and start another activity” (Banerjee and Horn, 2013; Connell et al., 1993; Mathews, 2012). The times when children move from one activity to another or every movement from one activity to another is a transition experience (Mathews, 2012). According to Banerjee and Horn (2013, 4), transition is not only a physical change of place, but also a movement with an educational purpose. Although transitions are often perceived as “lost time”, they are very valuable times when the child makes social observations, learns social rules, establishes social bonds, and develops self-care skills. However, in order for these transitions to be used well, strategies must be put to work correctly (Ergin and Bakkaloğlu, 2015). In order to use transition times effectively, the teacher must plan. Planning is very important for the child to gain routines because it increases their capacity to predict (Beban and McCormilla, 2012). It is also important for the teacher to be a model during transition times and to provide feedback by observing the children's behavior. With this approach, transitions turn from "lost time" into valuable learning times (Pica and Bouvier, 2012). The way the classroom is designed is also very important in turning transitions into learning routines. At this point, the physical conditions of the classroom also come to the fore.

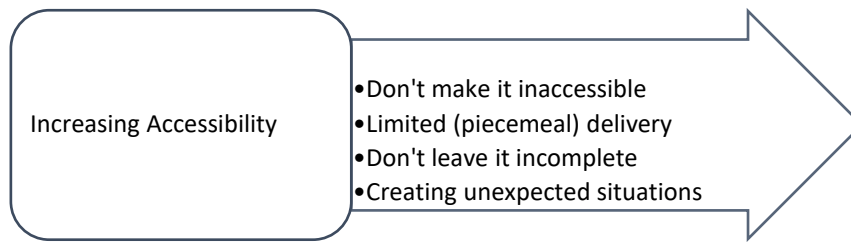
**The physical environment of inclusive classrooms**

The environment has stood out with its effect on learning since the first studies on learning were conducted. Children with special needs are often more sensitive to the environment due to their developmental characteristics. The environment offers a rich learning environment not only with its supportive feature but also with the challenges it sometimes creates (Acarlar, 2019).

The environment should be educational as well as supportive of the child's independent movement. Deitz et al. (2002) stated that a negative environment will first create a feeling of inadequacy in the child, and then this feeling will evolve into learned helplessness. This information emphasizes the importance of the environment being stimulating and not inhibiting (Temiz and Parlak-Rakap, 2018). Regulations regarding the physical environment are roughly divided into two categories. The first of these is physical environment regulations based on permanent interventions in the learning environment, the second is material adaptation and temporary regulations aimed at increasing the child's participation in the activity process. While environmental regulations are more general regulations concerning the physical structure of the classroom, temporary regulations are more specific regulations requiring special field knowledge and practical thinking skills (Sandall and Schwartz, 2014, p. 61).

**Environmental Regulations**

Educational interventions that transform physical environments into learning environments are included in the literature under the name of environmental regulations. The aim of environmental arrangements is to meet the learning needs of the child. In order for learning to be healthy, there is a principle of increasing the accessibility of the environment according to its developmental characteristics, especially its safety (Bowe, 2000). When the literature is examined, it is seen that increasing accessibility is generally gathered under four headings. These can be listed as making it inaccessible, providing it in a limited amount (in parts), leaving it incomplete, creating unexpected situations.



**Figure 2.** Increasing accessibility (Bowe, 2000).

The aim of making the material inaccessible is to force the special needs child to communicate with the teacher or other children by making the desired material inaccessible. A similar approach is also valid in giving in limited amounts (piece by piece). The child will ask the adult for the missing parts in order to complete the activity as needed. The last arrangement, which is creating surprising unexpected situations, is based on breaking the routine. Here, the aim is to use different skills and learning areas such as problem solving skills, communication skills, in unexpected situations such as a different material added to the environment, transition to a different game, changing playmates.

Physical arrangements are important not only for children with special needs but also for other children. In a correctly designed classroom, the educational program will undoubtedly be implemented more effectively. At this point, the concept of universal design, which is also very important for different disciplines, comes to the fore. Universal design, which has been used in the field of architecture for many years, has also come to the fore in the field of early childhood with the discovery of its contributions in supporting the independence of preschool children, whose speech skills are still in the development stage. After scientific studies have proven that well-organized classrooms reduce anxiety, increase interaction, increase exploratory behaviors and support independence, it has become a remarkable concept for the special field of inclusive education. At this point, UDECE (Universal Design for Early Childhood Education), which has become quite popular in recent years, has developed (Darragh, 2007).

There are seven basic principles of universal design. Within the scope of the principle related to the physical environment, it has been emphasized that; equal access should be provided for all individuals with equal use, flexibility of use should be arranged according to individual preferences and abilities, design should be easy to understand with simplicity and intuitiveness, understandable information should be presented to individuals effectively using pictorial, verbal, tactile support, design should minimize the dangers and negative effects that individuals may encounter with error tolerance, design should be used efficiently and comfortably with low physical effort and with minimum fatigue, size and space usage for learning should be in a way that supports the provision of appropriate size and space for the individual's body size, posture or mobility (Conn-Powers, Cross, & Zapf, 2006).

### **Adaptation of materials**

Material adaptation is a type of adaptation that allows the child to participate in the activity independently. The teacher allows the child to participate in the activity simultaneously with other children by adding or removing materials according to the child's disability. These adaptations may include the teacher placing the materials prepared for the child at the appropriate height, using tape to fix the material, using non-slip supports such as velcro, simplifying the skills required for the child, and making the materials larger and brighter to attract the child's attention (Sandal & Schwartz, 2014).

Apart from this, materials can also be adapted using technological devices. Adaptation can be done with high-tech devices as well as low-tech devices. Recently, phone applications have been developed as scientific project outputs on this subject. Plastic stabilizers made according to the child's height for bookshelves

and silicones that will thicken the grip area of the pencil to support pencil grasp will be important in terms of educational activities. It is not possible to give a uniform guidance on material adaptation (İpek, 2024).

### **Special materials**

The use of special materials and equipment is preferred in cases where existing materials cannot be adapted. In other words, if the child's developmental limitations are too advanced to allow for the normal flow in the inclusion process, it is recommended to use special materials. The use of special materials has a very important place in the inclusive education approach (Sandall & Schwartz, 2014).

In cases of advanced deformation where children with normal development and children with special needs cannot receive simultaneous education, the child with special needs is separated from the process and receives individual education (Kargin et al., 2010; İpek, 2024). However, small interventions in the process with special materials produce very positive results. In this respect, for example; if a child using a wheelchair cannot access the sensory motor table, he/she can sit on the table if the table is sturdy, or the teacher can provide sensory motor materials in an individual box. If the child's hand muscles are not strong enough to use scissors, the teacher gives the opportunity to use long loop scissors or supporting scissors (Sandal, Schwartz, 2014, 74-75). The use of these materials in the inclusion process varies according to the needs of the child with special needs. For this reason, the teacher should be informed about the characteristics of the special materials and equipment used according to the child's disability and should organize the environment in accordance with the use of these materials.

### **Adaptation of Methods and Techniques**

For an effective learning process in inclusive classrooms, teachers should pay attention to the adaptation of methods and techniques as well as the adaptation of materials and activities. In some cases, the child may lag behind the learning pace of the class or may need more clues. In such cases, the teacher should sometimes choose to be a model with narration and sometimes be in the classroom with an approach where the child is completely at the center (Temiz and Parlak-Rakap, 2018). Undoubtedly, the selection, implementation and evaluation of the appropriate method in the learning-teaching process requires field knowledge and equipment (Sucuoğlu and Kargin, 2006). This adaptation is the process of explaining the targeted information and skills with different methods and techniques according to the needs of the child, trying a different method in case of failure, and continuing this process until the target achievement is achieved. Kargin (2019) lists some of the methods used in the classroom environment as follows: Direct instruction, collaborative instruction, discovery instruction and embedded instruction. These methods and techniques can be diversified or used together according to the teacher's initiative.

Sandall and Schwartz (2014) gave the name "strategy" to the methods and techniques used by the teacher within the scope of instructional adaptations. Strategies refer to the approaches that the teacher can use practically in the adaptation process. These strategies are peer support, adult support, covert support and basic instructional strategies. Peer support is a strategy that allows children to participate in more activities in the learning process and allows them to continue their participation. Organizing this learning through modeling prepares the basis for permanent and desired learning. In this respect, the special work that the teacher will do to provide peer support is valuable in terms of facilitating the learning of the child (Metin, 2013). The process of children learning from their peers can be shaped through joint attention, object sharing, imitation and mediation. Studies have shown that children in classrooms where peer support is provided tend to regulate their behaviors mutually (Ferreira and Mäkinen, 2017).

Another type of support is adult support. Adult support is the process of providing help to a special child at different stages of the learning process and when necessary. This process of providing help can be expanded according to the child's needs, but the basic element at this point is the expansion of the child's

behaviors. The teacher's standing next to the child during the activity, providing help when he/she asks for help, and making praise and motivating speeches can be listed within the scope of adult support. Finally, covert support, which is another type of support used in this process, is the process of organizing the situations that naturally develop in the activity process for educational purposes. It is important in terms of increasing the child's active participation. Covert support can be offered in ways such as adding or removing materials to the environment, changing the order of participation in the game, changing the play partner, simplifying the game, joining and leaving the game, reducing the activity steps (passing if unsuccessful), etc. (Sandall & Schwartz, 2014).

### **Basic Instructional Strategies**

Basic instructional strategies are strategies aimed at increasing the child's participation. These strategies can be grouped as giving instructions, hints, and consequences strategies (Sandall & Schwartz, 2014). The instructions are to clearly tell the child what is expected from the child during the activity. The first of these steps is to attract the child's attention and make sure that his/her attention is on the teacher. Then, care should be taken to ensure that the instructions given are clear, understandable and short, and that one instruction is given at a time. Implementable, realistic and positive expressions should be used, and these expressions should be expressed using imperative sentences, not questions. Finally, children should be reinforced appropriately when they fulfill the instructions (Yücesoy-Özkan, 2019).

The outcome is the situation that occurs as a result of an event. The "outcome" used in the expression in outcome strategies refers to the child's behavior that occurs at the end of the intervention. The outcomes that emerge may be affected by environmental factors and may change. The most frequently preferred strategy to ensure continuity among outcome strategies is positive reinforcement. Apart from this, differential reinforcement and corrective/supportive feedback are also used (Sandall & Schwartz, 2014). Positive reinforcement is important in terms of ensuring the continuity of the behavior and increasing its frequency (Rakap Yücesoy-Özkan & Kalkan, 2019). When using this method, it is important to emphasize and appreciate the behavior. This approach is also important in terms of showing the expected behaviors. Drawing attention to positive behavior is a much more effective method than punishing negative behaviors (Clunies-Ross et al., 2008). For this reason, the use of positive reinforcement in inclusive classes is very important. Another important outcome strategy is differential reinforcement. Differential reinforcement is based on focusing on the process rather than evaluating the child's educational process in a result-oriented manner. Even if the child does not completely succeed in a behavior, the moments and areas where he/she is successful or makes an effort are determined and positive reinforcement is provided. Differential reinforcement is a very useful and motivating approach for children with low focus time, such as children with special needs. Corrective feedback includes guiding and supportive notifications for the development of areas where differential reinforcement is provided. Corrective feedback is very valuable in terms of the child's behavioral progress (Clunies-Ross et al., 2008; Sandall and Schwartz, 2008).

### **Instructional adaptations and teachers in preschool education**

Inclusive education is affected by many variables, from the physical conditions of the school to the region where it is located; from the use of special materials to the way the school administration is involved in the process; from the availability of support services to the level of knowledge of the child's family (Odluyurt and Batu, 2009; Duman-Sever, 2007). However, the teacher has a very different role among these variables. The teacher is not a part of the process, but rather is at the center of the process and dominates the entire educational flow. It is very valuable for a child with special needs to receive education in the same environment with a well-equipped teacher and peers in terms of supporting different developmental areas simultaneously (Dikici Sığırtmaç et al., 2011). In this respect, the first alternative for the child should not be individual/one-to-one/segregated education, but inclusive education (Kaygusuz, 2007).



In the context of inclusive education, when the last five years are considered throughout our country, geçmiş döneme göre bazı positive changes are seen. When the 2018-2019 formal education data is examined, the low number of children participating in integration is striking. Another striking situation is that the participation of girls is low, especially in the eastern provinces, and completely absent in Kars. When the disabilities of children participating in integration are considered, it is striking that children with mental disabilities (497 children) are in first place. Orthopedic disabilities (293 children) come in second place, and speech and language disorders (267 children) come in third place.

**Table 1**National Education Statistics Formal Education 2022/2023.

Type of school	School	Total number of students	Schoolgirl	Male Student
Special education formal education total	1859	507,804	321,312	186,492
number of schools				
Special education preschool total	378	8799	5925	2874
A special education school with a kindergarten class	136	1146	722	424
Inclusive education	-	1187	760	427

Source:[https://sgb.meb.gov.tr/www/icerik\\_goruntule.php?KNO=508](https://sgb.meb.gov.tr/www/icerik_goruntule.php?KNO=508)

When the current data in Table 1 is examined, it is seen that there is an increase in the total number of children and the participation in the number of girls has increased in all types of schools. With this situation, it is seen that inclusive education is preferred rather than individual education if the child's developmental characteristics are suitable. However, when considered on the basis of total figures, another result reflected in the table is that special education schools are preferred at a much higher rate than inclusive classes. Although there are improvements at this point, it also reveals the necessity of steps to be taken to spread inclusive education. When current studies are examined, it is also supported by the current data that inclusive education is not at the desired level (Akmeşe and Kayhan, 2016; Yılmaz, 2020).

### **The importance of instructional adaptations in the context of equal opportunities**

Every individual has the right to education " included in the Universal Declaration of Human Rights, the principle of equal opportunity in education has become one of the fundamental priorities of education. Thus, the right to education has been guaranteed by law in all developed and developing countries (Bayar, Özaşkın, & Bardak, 2015; Broderick, Mehta-Parekh, & Reid, 2005). Considering this universal principle, students who need special education should also be in regular education environments and benefit from the same educational opportunities that other individuals benefit from (Bayar, Özaşkın, & Bardak, 2015; Sakallı-Gümüş, 2013). In other words, individuals with special needs can adapt to the society they live in and continue their lives independently, depending on their ability to acquire and apply academic and non-academic skills at a general level. In order for them to gain these skills, teachers must first determine the educational needs of these individuals by taking their characteristics into account and provide qualified educational opportunities in general education institutions or special education institutions according to these needs ( McLeskey and Waldron, 2011). In particular, when it comes to the education of individuals with special needs who can benefit from educational opportunities in general education classes, inclusive practices come to the fore.

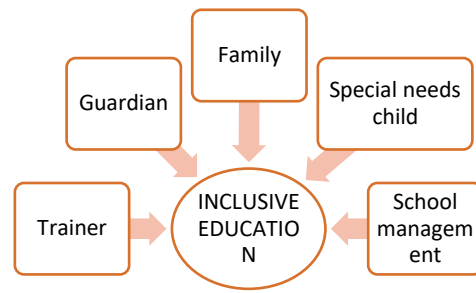


Figure 3. Components of inclusive education

In the light of literature data (Batu, 2010; Batu and Kircaali İftar, 2010; McLeskey and Waldron, 2011), the components of inclusive education can be shown as in Figure 2. The components in question are teachers, students with normal development, students with special needs, school management, teamwork, individualized education programs (IEP), support special education services and additional services, and educational adaptations ı kapsamakta.

For the implementation of a successful inclusive education process, education programs have been studied for many years. Teacher and family education has been planned based on what these programs should include. EASNI (2017), an agency that conducts studies on inclusive education [European Agency for Special Needs and Inclusive Education], has collected data through a comprehensive project carried out in 32 countries and aimed at developing inclusive education activities. As a result of this data, the Inclusive Early Childhood Education Ecosystem Model was created, inspired by Bronferbrenner's (1979) ecological system theory.

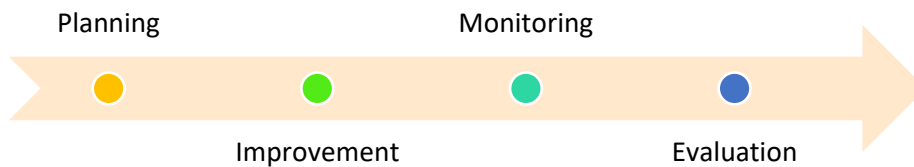
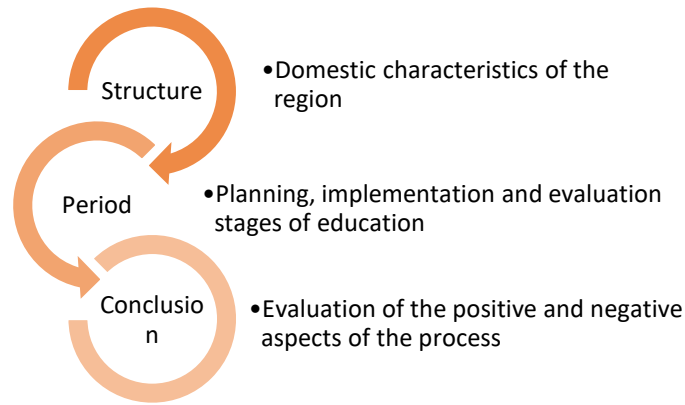


Figure 4. Inclusive Early Childhood Education Ecosystem Model

This approach *eğitimin planlanması, iyileştirilmesi, izlenmesi ve değerlendirilmesi* olmak üzere is based on four basic elements: . In order to be successful in implementing these four elements, it is suggested that each application be customized. This customization is carried out with *the structure-process-result* framework. While structure refers to taking into account the structural characteristics, climate and environmental conditions, and cultural context of the country in question, process refers to the interaction established with the child with special needs, other children, and implementers, and the harmony of these groups with the physical environment. The result refers to the correct and systematic evaluation of the effect of the structure and process on the child with special needs. In this model, the change of different components affects the other components, and as a result, the child with special needs, like a dynamo system. Therefore, it is carried out with a more holistic perspective and interdisciplinary studies.



**Figure 5.** Inclusive Early Childhood Education Ecosystem Model Operation

As scientific data on special education for children in early childhood increases, effective methods that can be applied in inclusive classrooms have also become a topic of discussion. These discussions have also brought about scientific studies on applications that include practical and permanent learning. Among the effective approaches of recent times is the Building Blocks System for Teaching Preschool Children with Special Needs, which Sandall and Schwartz (2008) created with an approach similar to the Inclusive Early Childhood Education Ecosystem Model approach for inclusive education.

The Basic Building Blocks System is formed with a ladder system where the steps cover each other from bottom to top. The first step is a high-quality early childhood education program. The second step includes curriculum changes and adaptations. The third step includes embedded teaching opportunities. The fourth step includes direct child-focused teaching strategies (Sandall and Schwartz, 2008). The starting point in this system is an educational program with broad gains and a flexible approach. Second-step adaptations will only be possible with a program that allows movement. The embedded teaching opportunities in the third step require a talented teacher and a well-equipped physical environment to put an effective program into practice. The child-focused teaching strategies in the last step include setting a roadmap and goals for each child and taking action. The steps in this system follow each other. In other words, strategies directly targeting preschool children cannot be applied in a school with a successful education program. Because the prerequisites for these strategies require a talented teacher and a well-equipped physical environment. Therefore, a long-term and permanent learning environment will be possible after each stage is successfully passed (Sandall and Schwartz, 2008). It is recommended that program makers, teachers, administrators and families cooperate and cooperate in this process.

The teacher can make flexible plans according to the needs of the region, school and child. At this point, two basic philosophies should be mentioned. The first of the important approaches that stand out in terms of instructional adaptations is the Response to Intervention approach. The Response to Intervention (RT) approach is based on the principle of action and reaction. In this approach, the educator follows a response-based flow by re-planning after each reaction given by the child. In other words, the child with special needs determines the pace and form of education (Fletcher & Vaughn, 2009). The time spent with the child is as important as the professional equipment of the educator in the success of this approach. Crowded classes are not suitable for successful RT (Bradley, Danielson, & Doolittle, 2005).

Another approach is the Multi-Tiered System of Supports. The Multi-Tiered System of Supports (ÇADS) focuses on the developmental area that needs to be specifically developed, in addition to the child's general development, and progresses with a goal-based approach. The important step in the success of ÇADS is to know the child and not to ignore cultural characteristics. For example, when evaluating the developmental progress of a child whose mother tongue is different and who has a diagnosis of language and speech disorder,

the fact that their mother tongue is different should definitely be considered. ÇADS basically progresses in three stages. In the first stage, the developmental practices in the current curriculum are presented with a game-based approach by making them fun in order to increase the child's participation (Barton et al., 2015). In the second stage, if there is a child who is unsuccessful in the current practice, either support is provided for them or instructional adaptations are made with practices such as simplification. The third and final stage is applied if the child has such a developmental disability that they cannot participate in the first two practices. In this stage, the teacher works with the child through one-on-one practices. The third stage of the CHADS is not suitable for large classes and can be presented with discrete or multiple teaching trials (Barton & Smith, 2015).

Barton and Smith (2015) stated that a quality inclusive education is a practice that supports children's development, increases their access to educational activities, and offers educational opportunities that are not fixed by adhering to the curriculum but with supportive interventions. These interventions can be providing special materials or organizing the environment. In its simplest form, it refers to reducing obstacles and increasing access. Another concept that is frequently used side by side with the concept of instructional adaptation is the concept of "participation". It has been stated that instructional adaptations include the facilitating and supportive interventions of the teacher, but the effectiveness of this intervention is related to the child's interest and attention and involvement in the process. In this respect, participation refers to the child's behavior of engaging in line with his/her own desires and interests after access opportunities are created. Another concept used side by side with the concept of participation is the focus period. Similarly, this concept refers to the duration of the child's undirected engagement behavior. The main element in the implementation of these concepts is the teacher. It is very important for the teacher to be aware of the concepts and to be able to include them in the activities in the classroom. All these components are important criteria in measuring the success of an educational process that serves its purpose (Aguilar, Moiterio, & Pimentel, 2010; Raspa, McWilliam, & Ridley, 2001).

Another basic concept in instructional adaptations is support. One of the important prerequisites for support is personnel. The professional competence, collaborative working capacity, problem-solving skills and practicality of the personnel are important (Winton, 2016). There is no doubt that being an educator is not the only variable in the healthy application of these concepts. Considering the importance of the country, region and even socioeconomic conditions and general education level where the school is located, even the environment where the school is located at the micro level will be decisive in the quality of the interventions. In this respect, it is essential for the reliability of the studies to take into account the differences arising from human characteristics in the evaluations made regarding instructional adaptations.

The education process in this age group is dynamic, variable and flexible. In addition to characteristics such as children's attention span and memory, the special child's mood that day, being sick or an element in the classroom that will affect his/her attention will completely affect the activities during the day. At this point, it is very important for the teacher to observe the process and make the right decisions, and for these decisions to be practical and applicable. The operation of this decision mechanism can only be possible with the knowledge, motivation and ability of the teacher (Fukkink and Lont, 2007). In this respect, as has been emphasized in the literature for a long time (Fukkink and Lont, 2007; Egert, Fukkink and Eckhardt, 2018), the quality of education in inclusive classes is still directly affected by the teacher's competencies in a century-long process.

In the circular of the General Directorate of Special Education Guidance Services (2012) regarding educational practices through inclusive education, the duties and responsibilities of teachers assigned in inclusive classes are mentioned. It is recommended that teachers be aware of the interests, talents, competencies and deficiencies of students with special needs, make preliminary preparations for this

awareness and record them. In addition, teachers should be aware of the individual differences and educational needs of students. Instead of a new plan based on responsible education programs, the content to be taught should be simplified. In this process, the individual differences and educational needs of all students should be taken into consideration by teachers (General Directorate of Special Education and Guidance Services, 2012).

### **Teacher Competence in Instructional Adaptations**

As the importance of inclusive education practices in preschool education is supported by scientific studies, the nature and quality of inclusive education practices have become a subject of discussion (Odom et al., 2011). When evaluated specifically in our country, inclusive education is based on simultaneous education in classes with different interests, needs and family structures in close age groups (MEB, 2013). It is possible to say that especially taking educational efficiency to the highest level in such classes requires high performance from the teacher's perspective.

Studies have shown that teachers working in schools that provide inclusive education need intervention programs and inclusive education programs. It is observed that teachers mostly provide unsystematic individual social skills training in classes (Sucuoğlu & Kargin, 2006). It is emphasized that teachers who have difficulty in classroom management, in particular, need intervention programs to improve classroom practices (Aydın & Tuğluk, 2020). As a result, teachers voluntarily want to participate in inclusive education programs (Gettinger, Hamre, & Oyler, 2004; Harvey, Yssel, Bauserman, & Merbler, 2010; Voss & Bufkin, 2011). Closely related to this result, there are also studies on the effect of inclusive education programs on teachers' attitudes towards inclusion. Studies have shown that teachers have different thoughts about students with special needs in inclusive practices (Karaca, 2018). Many studies state that teachers initially have concerns and negative views towards children with disabilities. Teachers' attitudes towards students with special needs vary depending on the teacher's age, the level of support teachers receive from school administration and other personnel. At this point, although the teacher's professional equipment, the conditions of the school he/she works in and his/her teaching skills are important, it is seen that the most decisive factor is the teacher's equipment and experience in how to intervene with the child (Dikici- Sığırtmaç, Hoş and Abbak, 2011; Dolapçı, 2013, Öncül, 2014; Evins, 2015).

### **Recommendations for enhancing the professional development of preschool teachers in the context of instructional adaptations**

Children with special needs are an important part of society, just like normally developing children. Therefore, it is within the scope of the right of a child with special needs to receive education simultaneously with their peers for children who are deemed suitable for inclusion by medical and educational diagnoses. In order for this education to be successful, the teacher must have sufficient field knowledge regarding when, how and to whom instructional adaptations will be applied. The finding that increasing teachers' awareness on this issue directly and positively affects the quality of inclusive education activities in many studies (Artan & Uyanık-Balat, 2003; Bricker, 2000; McLeskey, Rossenberg, & Westling, 2012; Kale, Sığırtmaç, Nur, & Abbak, 2016; Güven, 2016) supports this argument.

It is known that teachers working in inclusive classes feel anxious and inadequate towards children with special needs in their classes. It is seen that teachers do not know what to do in their negative emotional states, neglect other children in the class while dealing with the special child, neglect the special child while dealing with other children in the class, and have difficulty in providing classroom management are effective (Akman, Uzun, & Yazıcı, 2018; Sucuoğlu et al., 2014). It is seen that teachers in related studies structure the classroom processes based on "one-on-one" care with the child with special needs, and even if writing an individual education plan is not mentioned, they include statements such as "they cannot spare one-on-one

time” (Varlier, 2004). In the study conducted by Dođarođlu and Dümenci (2015), a preschool teacher stated that she could not spend one-on-one time with the child with special needs, even though she should have, because she was worried that spending one-on-one time with the child with special needs would create jealousy in normally developing children. These findings are based on the teachers' perception that the difficulties they experience in the classroom are due to the fact that they think that they can provide the right education only ,when they deal with special children one-on-one. In this respect, educational adaptations provide teachers with the support they need by allowing all children to learn simultaneously, in the same environment but at their own pace. While the teacher includes the child with special needs in the activities with the support he/she will provide within the flow, he/she also supports the educational process of other children in the class. In addition, since all children focus on the teachers at the same time, classroom management loses its challenging feature in a moderate learning environment.

Preschool teachers in inclusive classes should create an ideal learning environment for both normally developing and special needs children simultaneously. Therefore, instead of creating a separate daily routine for both groups, an effort should be made to create a common learning environment by making arrangements in the existing daily routine according to the needs of the special needs child. Article 23, subparagraph i of the Special Education Services Regulation, which entered into force in 2006, includes the phrase “...necessary measures are taken and arrangements are made in the tools, educational materials, teaching methods and techniques, and measurement and evaluation according to the type of disability, educational performance and needs of the students who continue their education through integration.” Therefore, educational adaptations are not a choice for preschool teachers, but rather a necessity. In this sense, it is very important for preschool teachers, who play a key role in this process, to be supported in terms of both professional competence and professional motivation. In order to both increase and evaluate the quality and effects of the teaching profession in the recent period, professional skills ;have been grouped under the categories of general culture, field knowledge and teaching professional knowledge (Demiral and Kaya, 2003; Şişman, 2009). However, beyond this theoretical knowledge, it is observed that teachers who start working in the field develop repetitive behavioral patterns after a while and adopt their own professional routines (Karataş, 2020). If the working environments of teachers in this routine are also parallel to this routine flow, it is possible that they do not develop awareness on this issue and continue their current false beliefs and practices. This situation is also a situation that forms the basis of adult learning. Öğretmenlerin alanyazında sıklıkla yer alan ve yetersiz oldukları belirtilen konularda hizmet içi eğitimlerle desteklenmeleri bu açıdan çok önemlidir. These issues are listed as evidence-based practices that can be easily reflected in the inclusive education-training process, preparation of Individualized Education Programs (IEP), preventing and coping with problem behaviors, effective educational adaptations and interaction with families (Boyd, Kucharczyk and Wong, 2016).

In the studies in which teachers' opinions were sought in the literature, it was stated that teachers had problems in including families in the process, establishing a bond of trust with them and supporting the child after school (Öncül, 2014; Aslan, 2016). Including the support of adults other than the teacher in instructional adaptations and encouraging family members to be a part of the process is a strong alternative in terms of including families in the process. In addition, it is important as an up-to-date guide for studies on including teachers in the process in studies to be planned for instructional adaptations in the field of preschool education.

The great contributions of quality inclusive education activities on child development have been recognized all over the world, especially in the last decade (Shonkoff, 2010; Shonkoff and Philips, 2000). The positive effects of inclusive education on children with special needs are observed in different developmental areas, especially in their social development (Frawley, 2014). In a study conducted with teachers in a preschool institution in Switzerland, Ginner Hau, Selenius and Björck Åkesson (2022) drew attention to an important issue regarding the quality of inclusive education. The researchers stated that a child with special needs

receiving education in a classroom ideally arranged for them or using a special program does not indicate that they are receiving inclusive education. They stated that it can be claimed that the child is receiving inclusive education only if they consistently participate in activities (attendance) and are included with a sense of belonging (involvement). Imms (2017) emphasized that the mere presence of the child in the classroom is not evidence that they are receiving inclusive education, and that changes in the child's development should be monitored. Therefore, in producing scientific data on inclusive education activities, not only programs and teachers but also the positions of children with special needs in the process should be taken into account. For this purpose, forms to be used without obtaining information from families and face-to-face meetings will be effective methods. In addition, the teacher's observations of the child's areas of interest and the experiences he/she will gain by participating in the child's games will also be healthy data sources for the instructional planning process.

As is also included in different approaches and intervention programs regarding instructional adaptations, the only component of a successful education process is undoubtedly not the teacher, program or special needs child. Although the teacher is the most important component of the process, the characteristics of the program he/she is expected to adapt, his/her philosophy, the attitude of the school administrator and his/her colleagues at the same school will also be decisive in the process. In addition to this situation, the physical conditions of the classroom, the environment where the school is located and the socioeconomic status will also implicitly guide the teaching activities. The family's perception of the child, the knowledge and approaches of other families regarding special education are equally important. In this context, determining an interactive and supportive approach by considering all the components of the process is valuable in terms of achieving satisfactory educational success.

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