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Contents

Research Article

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Research Article

Disaster Preparedness: Beliefs of Physical Education Teacher Education Majors

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Abstract: This study examined the differences in disaster preparedness beliefs among physical education teacher candidates based on gender and grade level. A total of one hundred and forty-nine physical education teacher candidates, 61 male and 88 female took part in the study. The General Disaster Preparedness Belief Scale, which encompasses six sub-dimensions (Self-efficacy, Cues to Action, Perceived Susceptibility, Perceived Barriers, Perceived Benefits, and Perceived Severity) was used to collect data. An independent samples t-test was used to analyze normally distributed data to determine whether physical education teacher candidates' beliefs on general disaster preparedness sub-dimensions differed by gender, and a one-way analysis of variance (ANOVA) was used to determine whether they differed by grade level (1st, 2nd, 3rd, and 4th). The results indicated significant variations between genders in almost all aspects of general disaster preparedness beliefs, with female physical education teacher candidates scoring higher in Self-efficacy, Cues to Action, Perceived Susceptibility, Perceived Barriers, Perceived Severity, and general disaster preparedness. However, Perceived Benefits scores were similar across genders. No notable differences were found in the general disaster preparedness beliefs and sub-dimension scores of physical education teacher candidates based on the grade level of the candidates. The findings indicate that, except for Perceived Benefits, physical education teacher candidates' general disaster preparedness beliefs and beliefs regarding sub-dimensions differed by gender but not by grade level studied, which may indicate that gender is related to disaster preparedness beliefs. The study underscores the importance of addressing gender disparities in disaster preparedness beliefs to ensure equitable societal preparedness efforts. Efforts should focus on enhancing disaster preparedness beliefs among all individuals, irrespective of gender, to foster a more resilient and prepared community.

Keywords: Disaster Preparedness Belief, Teacher Candidate, Physical Education

1. Introduction

A disaster, whether natural, man-made, or a combination, is a sudden, widespread, and often severe event or occurrence that disrupts the normal functioning of a community or society and causes significant damage, destruction, and loss (Caldera & Wirasinghe, 2022; Wisner & Adams, 2002; World Health Organization [WHO], 2002). Earthquakes, volcanoes, hurricanes, floods, and fires are natural disasters, while wars, pollution, nuclear explosions, fires, exposure to hazardous substances, explosions, and transport accidents are man-made disasters (Zibulewsky, 2001). Disasters, whether they are man-made or natural, can have profound effects on individuals and communities across various dimensions. From the immediate physical harm caused by the event itself to the long-term consequences on mental health, infrastructure, and economic stability, the impact can be devastating (Lichterman, 2000).

Disasters, which are unpredictable and often uncertain in location and timing, are common worldwide (Assar, 1971; Lindell, 2013; Sawada, 2007). For example, the Emergency Event Database reports 387 natural disasters and hazards worldwide in 2022, resulting in 30,704 deaths and affecting 185 million people (Center for Research on the Epidemiology of Disasters, 2023). Türkiye is another disaster-prone region of the world, with 905 reported natural disasters in 2020 alone, according to national data (Ministry of Interior Disaster and Emergency Management Presidency [AFAD], 2021).

The severity and impact of a disaster are influenced by its size, duration, location, population density, and level of preparedness, among other factors (Naghii, 2005). Effective disaster management requires preparedness, response, and mitigation to reduce disaster risk and impact (Moe et al., 2007). While it is impossible to completely prevent disasters from occurring, steps such as developing response strategies by assessing disaster-related risks, evacuating people from disaster-prone areas before disaster strikes, developing early warning systems for impending disasters, informing people about what to do before,

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during, and after a disaster, developing durable infrastructure systems for construction, preventing settlement in disaster-prone areas through appropriate zoning, taking measures to protect the environment that help prevent disasters, training well-equipped personnel to respond to disasters, establishing communication networks between all institutions and organizations in society for cooperation and coordinated response, and continuously monitoring and evaluating disaster preparedness can help minimize the adverse effects of disasters (McEntire, 2015; Paton et al., 2000; Steigenberger, 2016). Since a disaster is simply defined as any event that exceeds the capacity of affected individuals or communities to relieve their suffering or meet their needs without outside help (Lindell & Prater, 2003), disaster preparedness at the national and personal level is essential to minimizing the risks of such events in disaster-prone regions such as Türkiye.

Disaster preparedness is an ongoing process of assessment, planning, and training to prepare a coordinated response. It involves anticipating, preventing, and responding to disasters to reduce their adverse effects (Keeney, 2004). Disaster preparedness is primarily about improving the ability to respond effectively to emergencies, mitigate damage, and protect lives and property. Through the implementation of these strategies, people, communities, and organizations can improve their ability to respond to and recover from disasters, minimize the loss of life and property, and promote resilience in the face of adversity (United Nations Development Program, 2016). Research highlights the importance of personal disaster preparedness in reducing the negative impact of disasters and the need for responsible and empowered bodies to prepare for and respond to disasters (Levac et al., 2012). Research on disaster preparedness suggests that individuals and families are likely to be "on their own" in the first 72 hours following a disaster, that the regular flow of products and services is disrupted, and that emergency services are unable to meet all the demands. This has led to an emphasis on self-sufficiency at the community, family, and individual levels, which is critical to filling the gaps in what agencies are supposed to do in the first three days following a regional disaster (Kohn et al., 2012; Russell et al., 1995). Despite these important insights, both national and international studies of personal disaster preparedness have shown that it is not sufficient (Cretikos et al., 2008; Çelik & Gündoğdu, 2022; Kapucu, 2008; Loke et al., 2012; Şahin et al., 2018).

Given the multifaceted nature of preparing for and coping with disasters, many factors influence disaster preparedness. The literature has identified several factors as barriers to disaster preparedness, including a lack of prior disaster experience, a lack of disaster awareness and knowledge of protection, trait anxiety, an external locus of control, being a female, low socioeconomic status, weak social ties, and a lack of community involvement (Mishra & Mazumdar, 2015). According to Kohn et al. (2012), who conducted a thorough literature review of individuals' disaster preparedness behaviors, numerous factors influence disaster preparedness behaviors, including demographic characteristics such as gender, age, education, and race; whether the person has experienced a disaster or not; the number of dependents at home; trust in authorities; level of risk awareness; preparedness responsibility; and threat construction in cognition. Another component that was found to influence individuals' disaster preparedness activities was "beliefs" about disasters, which were found to include hazard beliefs, preparedness beliefs, and personal beliefs. Beliefs about disaster preparedness were those that were closely related to "risk perceptions," people's perceptions of what it means to be prepared and how effective it is, and individuals' personal beliefs about how disasters affect them and how to deal with them (Becker et al., 2013). In the process of scale development, Inal, Altintas, and Dogan (2018) examined disaster preparedness beliefs in Turkish culture. The researchers found that disaster preparedness consists of people's views of their ability to cope with a disaster, their perception of vulnerability to experiencing a disaster, their perception of the severity of a disaster, their perception of the benefits of being prepared for a disaster, their perception of barriers to being prepared and their perception of action cues for being prepared for a disaster.

Disaster preparedness beliefs of different samples have been investigated in several studies. One of the national studies examined healthcare students' disaster preparedness beliefs and found that students' overall disaster preparedness beliefs were above average, with females scoring higher than males. It was also found that students who had been trained in disaster preparedness believed that they were better prepared to deal with a disaster than those who had not received such training (Ertuğrul & Ünal, 2020). Another study investigating the disaster preparedness beliefs of academic and administrative staff in universities found that those with higher monthly incomes, higher professional status, and more experience with disasters and emergency or disaster training had higher levels of beliefs (Inal et al., 2019). An extensive study was conducted on the disaster preparedness beliefs of teachers in the field of education with the participation of 19,723 teachers across Türkiye and it was found that the level of disaster preparedness beliefs did not differ based on the gender of the teachers; the level of disaster preparedness beliefs increased with increasing age; the level of disaster preparedness beliefs of teachers who received disaster training was higher than that of those who did not; and the level of disaster preparedness beliefs of teachers did not differ based on the geographical region where the teachers worked (Dasci-Sonmez & Gokmenoglu, 2023). In another study, Altıntaş Çolak (2023) examined the disaster preparedness beliefs of primary school teachers and found that teachers' general disaster preparedness beliefs were above the average and reported that female teachers' disaster preparedness beliefs were higher than those of male teachers. Disaster preparedness beliefs of nurse educators were investigated in another study conducted in the field of education and the study results showed that the level of disaster preparedness beliefs among nurse educators was above the average and similar between the sexes (Arkan Üner & Erkin, 2023). The strong belief in disaster preparedness was also found in a study conducted with the participation of emergency and disaster management students studying to become experts in this area (Demirbilek & Gökkaya, 2022). The gender variable was reconsidered in this study because, according to the literature reviewed, it is not clear whether individuals' disaster preparedness beliefs differ based on gender. In addition, the fact that almost no studies have been conducted on the study variable of grade level concerning disaster preparedness beliefs influenced the decision to include this variable in this study.

Türkiye is a country with a long history of frequent disasters of various kinds. The most recent was on 6 February 2023, when 50,783 people died in the 7.7 and 7.6 magnitude earthquakes centered on Kahramanmaraş (Ministry of Interior, 2023). Earthquake awareness has increased across Türkiye among people from all walks of life since these earthquakes. In addition, research on disasters and the factors associated with them has become increasingly important. By identifying the earthquake preparedness beliefs of physical education teacher candidates who are part of society, this study is likely to contribute to the relevant literature. In addition, although the provinces where the participants in this study live were not declared disaster areas, they were neighbors of the earthquake-affected regions; they felt the 7.7 and 7.6 magnitudes of earthquakes strongly; and they lived in provinces where many earthquake survivors migrated after the quake and witnessed the experiences of earthquake migrants. Regarding these characteristics, this study will contribute to the relevant literature by comparing similar findings with those that include disaster preparedness beliefs of those who have experienced earthquakes. Disaster preparedness is also of vital importance for all key stakeholders, whether they are directly involved or not when a disaster occurs. Since the first step in disaster preparation is to believe in preparing for a disaster, it is important to examine disaster preparedness beliefs among university students, which are likely to play a primary role in responding to and recovering from a major disaster. It is critical that teachers, and in this study specifically physical education teacher candidates, are examined for their beliefs about earthquake preparedness since they will serve as role models for students and society. Moreover, schools are living environments where students, teachers, and administrators spend most of their time away from their homes (Shah et al., 2020). As schoolchildren are vulnerable to natural disasters, they need the protection of those who care for them (family,

teachers, school administrators, etc.). For this reason, to respond effectively and on time, and to minimize the damage to students and society, school preparedness for natural disasters is crucial (Dasci-Sonmez & Gokmenoglu, 2023). In this study, it was deemed necessary to examine teacher candidates' disaster preparedness beliefs, which will influence their disaster preparedness behaviors, because disaster preparedness must involve all stakeholders in the school, and teacher candidates are one of these stakeholders (Bhebhe et al., 2019). Examining disaster preparedness beliefs is crucial as teacher candidates will be actively contributing to society's fight against potential adverse effects of disasters, so it is important to examine their beliefs about disaster preparedness. Given that teacher candidates will be role models of disaster preparedness for students and society when they become teachers, it is suggested that examining their beliefs about disaster preparedness during the process of becoming a teacher candidate will enable precautions to be taken against possible negative outcomes (Kawasaki et al., 2022). To conclude, it can be said that beliefs about disaster preparedness are an important issue for physical education teacher candidates, as for all individuals in society, as they have a direct impact on disaster preparedness behaviors. Furthermore, an important component of an effective learning environment is the safety of those involved within the school (students, teachers, administrators, staff, etc.) and those involved outside the school (families, community, etc.). Physical educators, like all educators, have responsibility for the welfare of their students during school activities, including in the event of emergencies, and for keeping students safe and prepared for emergencies outside of school. Although not directly related to disasters, physical education teachers, like all other subject teachers, attend courses (Health Knowledge and First Aid, Classroom Management) in teacher training programs to acquire the knowledge and skills to deal with emergencies and unexpected events appropriately (Council of Higher Education [CoHE], 2018). The use of the knowledge and skills acquired in these courses in emergencies is linked to teachers' and teacher candidates' beliefs about disaster preparedness. Furthermore, in first aid-related courses (e.g. first aid and traffic culture) in schools (Ministry of National Education [MoNE], 2018), physical education teachers can promote a sense of responsibility and resilience in students by demonstrating leadership in preparedness, particularly by supporting the provision of information on how to prevent situations requiring emergency help. Based on this research, it will be possible to take several steps to help change negative beliefs into positive ones. With the information from this study, it will also be possible to develop earthquake preparedness plans for the educational sector as well.

Based on these contributions, this study sought to determine whether physical education teacher candidates hold different beliefs about disaster preparedness depending on their gender and grade level. The research questions of this study are as follows:

a. What is the difference in disaster preparedness beliefs of female and male physical education teacher candidates?

b. What is the difference in disaster preparedness beliefs of 1st, 2nd, 3rd, and 4th-grade physical education teacher candidates?

2. Method

2.1. Research design

In the current study, a cross-sectional descriptive survey was conducted using quantitative research techniques. It also used a research model known as correlational research, which examines the relationship between variables in various groups or conditions. Correlational research examines whether there is a relationship between two or more variables and how this relationship varies between groups (Fraenkel et al., 2012).

2.2. Participants

The participants in this study were undergraduate students in the Department of Physical Education and Sport who were selected using a convenient sampling method. Of the 149 participants, 59.1% were female and 40.9% were male; 23.5% were in the first grade, 23.5% were in the second grade, 25.5% were in the third grade, and 27.5% were in the fourth grade (Table 1). The mean age of the participants was 21.79 (*SD* = 2.30) years, 21.86 (*SD*= 2.37) years for the women, and 21.67 (*SD*= 2.22) years for the men. 44% of participants resided in the provinces that were declared as disaster zones (Hatay, Osmaniye, Gaziantep, Adana, Diyarbakır, Şanlıurfa, Kayseri, Mardin, Niğde, Batman) after the Kahramanmaraş Earthquakes on 6 February 2023, while 52% of participants resided in Mersin. Additionally, during the Kahramanmaraş earthquakes, 46% of the participants were in the cities in the disaster zone (Kahramanmaraş, Hatay, Osmaniye, Gaziantep, Adana, Diyarbakır, Şanlıurfa, Kayseri, Mardin, Niğde, Batman) and 50% of the participants were in Mersin, which is on the border of the disaster zone city of Adana. The remaining 4% of the participants lived outside the affected provinces and were in these provinces at the time of the earthquake.

Table 1

Demographic Characteristics of Study Participants

Demographics		n	%
Gender	Female	88	59.1
	Male	61	40.9
Grade	1st grade	35	23.5
	2nd grade	35	23.5
	3rd grade	38	25.5
	4th grade	41	27.5

2.3. Data collection instruments

2.3.1. Demographic information form

The researchers developed the demographic information form that was used in this study, which included questions about the gender of the participants, their age, and their grade level. The participants also provided information about their hometown and about where they had been during the earthquakes in Kahramanmaraş.

2.3.2. General disaster preparedness belief scale

In this study, participants' beliefs about disaster preparedness were examined using a General Disaster Preparedness Belief Scale (Inal et al., 2018). The scale has a total of 31 items and 6 subscales named Self-efficacy (8 items), Cues to Action (5 items), Perceived Susceptibility (6 items), Perceived Barriers (6 items), Perceived Benefits (3 items), and Perceived Severity (3 items). The scores for each item range from 1 (strongly disagree) to 5 (strongly agree) on a 5-point Likert scale. The total scale and sub-dimension scores are derived by summing the scores of each item and dividing by the number of items. While the possible scores range from 1 to 5, a high score indicates that the individual has a strong belief in the preparedness for earthquakes. The Cronbach's alpha reliability coefficients were calculated to be between .74 and .90 for the sub-dimensions and .90 for the total scale. In this study, the alpha reliability coefficients ranged from .64 to .77 for the subscales and .81 for the overall scale.

2.4. Data collection procedures

Before the start of the research, approval was obtained from the Ethics Committee of Sports Science (05/06/2023-029) and official permission was obtained from the institution where the data would be collected. Due to the decision of the Council of Higher Education [CoHE] (2023) to allow distance learning due to the Kahramanmaraş earthquakes, the data collection procedures were conducted

remotely. Following this, the data collection instruments were transferred to an application that would allow for the digital collection of data. A link from the digital data collection instruments was sent to students' digital contact addresses (e-mail, message, chat, etc.) with information about the study and a statement that participation was voluntary. It took the participants an average of 5 minutes to complete the data collection tools.

2.5. Data analysis

To ensure that the assumption of normality of the distribution was not violated, a preliminary analysis was performed before data analysis. The results of the normality test were that all the data had a normal distribution. The skewness (Self-efficacy= .294, Cues to Action= -.072, Perceived Susceptibility= -.657, Perceived Barriers= .041, Perceived Benefits= -.977, and Perceived Severity= -.452; Overall scale= -.017) and kurtosis values (Self-efficacy= .058, Cues to Action= -.178, Perceived Susceptibility= .519, Perceived Barriers= -.365, Perceived Benefits= .567, and Perceived Severity= -.313; Overall scale= -.049) were between +1 and −1, which is an indication that the distribution of the data could be considered normal. As suggested by Mertler and Reinhart (2017), skewness and kurtosis values lying between -1 and +1 were used as an acceptable range for normality. Due to the normal distribution of research data, an independent samples *t*-test was used to determine whether participants' disaster preparedness beliefs differed by gender, and a one-way analysis of variance (ANOVA) with post hoc analysis using Scheffe's test was used to determine whether participants' earthquake preparedness beliefs differed by grade level. Statistical analysis was performed using the Statistical Package for Social Sciences (SPSS) version 20.0.

3. Results

The research analyzed the scores of the physical education teacher candidates that were derived from the General Disaster Preparedness Belief Scale and presented the means and standard deviations in Table 2.

Table 2

Results of Participants' Beliefs in Subdimensions of General Disaster Preparedness

Scale Sub-Dimensions	*n*	$\bar{x}$	*SD*
Self-efficacy	149	3.38	0.36
Cues to Action	149	3.64	0.58
Perceived Susceptibility	149	3.81	0.45
Perceived Barriers	149	3.63	0.63
Perceived Benefits	149	4.15	0.75
Perceived Severity	149	3.86	0.80
Overall Scale	149	3.68	0.37

As shown in Table 2, the sub-dimensions and total scale scores of physical education teacher candidates' general disaster preparedness beliefs were higher than the mean scores.

An independent samples *t*-test was used to determine whether there were gender differences in the beliefs of the physical education teacher candidates on the sub-dimensions and the total scores derived from the General Disaster Preparedness Belief Scale. The analysis of the results is presented in Table 3.

Table 3

Results of t-test Comparing Participants' Beliefs on Sub-dimensions of General Disaster Preparedness by Gender

Scale Sub-Dimensions	Gender	*n*	$\bar{x}$	*SD*	*t*
Self-efficacy	Female	88	3.44	0.36	2.83*
	Male	61	3.28	0.33	
Cues to Action	Female	88	3.75	0.51	2.72*
	Male	61	3.49	0.64	
Perceived Susceptibility	Female	88	3.89	0.39	2.53**
	Male	61	3.70	0.50	
Perceived Barriers	Female	88	3.74	0.62	2.52**
	Male	61	3.48	0.61	
Perceived Benefits	Female	88	4.21	0.68	1.31
	Male	61	4.05	0.83	
Perceived Severity	Female	88	4.01	0.80	2.77*
	Male	61	3.65	0.76	
Overall Scale	Female	88	3.77	0.37	3.79*
	Male	61	3.54	0.34	

*p<.01
**p<.05

The results of the independent samples *t*-test showed that the Self-efficacy [$t(147)= 2.83$, $p= .005$], Cues to Action [$t(147)= 2.72$, $p= .007$], Perceived Susceptibility [$t(147)= 2.53$, $p= .013$], Perceived Barriers [$t(147)= 2.52$, $p= .13$], Perceived Severity [$t(147)= 2.77$, $p= .006$] and total scale scores [$t(147)= 3.79$, $p= .001$] of female and male physical education teacher candidates were statistically different. One of the other sub-dimensions of the scale, Perceived Benefits, showed no gender differences in the scores of the physical education teacher candidates [$t(147)= 1.31$, $p= .192$] (Table 3). According to these findings, it was observed that Self-efficacy ($\bar{x}_{female}= 3.44$, $SD_{female}= .36$; $\bar{x}_{male}= 3.28$, $SD_{male}= .33$), Cues to Action ($\bar{x}_{female}= 3.75$, $SD_{female}= .51$; $\bar{x}_{male}= 3.49$, $SD_{male}= .64$), Perceived Susceptibility ($\bar{x}_{female}= 3.89$, $SD_{female}= .39$; $\bar{x}_{male}= 3.70$, $SD_{male}= .50$), Perceived Barriers ($\bar{x}_{female}= 3.74$, $SD_{female}= .62$; $\bar{x}_{male}= 3.48$, $SD_{male}= .61$), Perceived Severity ($\bar{x}_{female}= 4.01$, $SD_{female}= .80$; $\bar{x}_{male}= 3.65$, $SD_{male}= .76$) and totall scale scores ($\bar{x}_{female}= 3.77$, $SD_{female}= .37$; $\bar{x}_{male}= 3.54$, $SD_{male}= .34$) of female physical education teacher candidates were higher than those of males. The scores of the male and female candidates on the Perceived Benefits sub-dimension of the scale were similar ($\bar{x}_{female}= 4.21$, $SD_{female}= .68$; $\bar{x}_{male}= 4.05$, $SD_{male}= .83$).

A one-way ANOVA followed by a Scheffe post hoc analysis was used to determine whether the sub-dimensions of general disaster preparedness beliefs and the overall scores of the male and female physical education teacher candidates differed by grade level (1st, 2nd, 3rd, and 4th grade). The results of the analysis are presented in Table 4.

Table 4

Results of the ANOVA Comparing Participants' Beliefs on Sub-dimensions of General Disaster Preparedness by Grade Level

		n	$\bar{x}$	*SD*	*F*
Self-efficacy	1st Grade	35	3.30	0.39	0.83
	2nd Grade	35	3.38	0.36	
	3rd Grade	38	3.38	0.32	
	4th Grade	41	3.43	0.36	
	Total	149	3.38	0.36	
Cues to Action	1st Grade	35	3.52	0.53	1.21
	2nd Grade	35	3.69	0.67	
	3rd Grade	38	3.59	0.51	
	4th Grade	41	3.76	0.58	
	Total	149	3.64	0.58	
Perceived Susceptibility	1st Grade	35	3.92	0.38	2.70*
	2nd Grade	35	3.66	0.62	
	3rd Grade	38	3.76	0.48	
	4th Grade	41	3.89	0.37	
	Total	149	3.81	0.45	
Perceived Barriers	1st Grade	35	3.65	0.60	2.00
	2nd Grade	35	3.43	0.68	
	3rd Grade	38	3.64	0.55	
	4th Grade	41	3.78	0.66	
	Total	149	3.63	0.63	
Perceived Benefits	1st Grade	35	4.32	0.68	3.20*
	2nd Grade	35	3.89	0.95	
	3rd Grade	38	4.04	0.69	
	4th Grade	41	4.32	0.59	
	Total	149	4.15	0.75	
Perceived Severity	1st Grade	35	3.96	0.82	1.64
	2nd Grade	35	3.66	0.81	
	3rd Grade	38	3.79	0.85	
	4th Grade	41	4.02	0.70	
	Total	149	3.86	0.80	
Overall Scale	1st Grade	35	3.69	0.32	2.12
	2nd Grade	35	3.59	0.45	
	3rd Grade	38	3.64	0.34	
	4th Grade	41	3.78	0.35	
	Total	149	3.68	0.37	

*p< .05

According to the results of the one-way ANOVA, there was no statistically significant difference in the scores for Self-efficacy [F(3, 148)= .83, p= .482], Cues to Action [F(3, 148)= 1.21, p= .308], Perceived Barriers [F(3, 148)= 2.00, p= .116]. There was a significant difference in the Perceived Severity [F(3, 148)= 1.64, p= .184], and total scale scores [F(3, 148)= 2.12, p= .100] of physical education teacher candidates based on the grade level, but there was a significant difference in the Perceived Susceptibility [F(3, 148)= 2.70, p= .048] and Perceived Benefits scores [F(3, 148)= 3.20, p= .025]. As a result of the Scheffe post hoc analysis carried out to determine the difference between the scores of the students studying in which grade, it was found that the scores for Perceived Susceptibility and Perceived Benefits did not differ by grade level studied, p> .05.

4. Discussion

The results of this study, designed to examine whether the general disaster preparedness beliefs of physical education teacher candidates differed by gender and grade level, showed that the levels of Self-efficacy, Cues to Action, Perceived Susceptibility, Perceived Barriers, Perceived Severity, and general disaster preparedness beliefs were higher among female physical education teacher candidates than among males.

One of the components of general disaster preparedness beliefs is self-efficacy, which is the belief that one can cope with a crisis or disaster on one's own. Female physical education teacher candidates had stronger self-efficacy beliefs about preparing for disasters than male candidates, and self-efficacy beliefs about disaster preparedness did not change by grade level studied, according to the results of this study. Research suggests that traditional gender roles contribute to the lack of self-efficacy of women in preparing for disasters (Scanlon, 1997). In the event of a disaster, women do a better job than men preparing their families and communities for disasters by doing work that is attributed to gender inequality rather than physical strength, such as making homes habitable again, serving food in shelters, and caring for their children and the elderly in shelters and temporary homes (Ashraf & Azad, 2015; Fothergill, 1996; Fujii & Kanbara, 2019; Okay & İlkkaracan, 2018; WHO, 2002). Given that keeping the family together and meeting its basic needs in the event of a disaster is a major responsibility and burden, women's efficacy beliefs about disaster preparedness may have been higher than those of men, reflecting these factors (Cvetković et al., 2018). Türkiye is a country where traditional gender roles are reflected in society and where women have to fight for acceptance in many areas that are dominated by men (Sakallı-Uğurlu et al., 2018). Based on these conditions, female participants in this study may have expressed their self-efficacy beliefs more dominantly than male participants. In addition, the participants in this study are physical education teacher candidates and participants are qualified, skilled, and able to take part in physical education and sports activities. Although not directly asked, the candidates had at some point in their lives experienced physical education and sports-related activities. With a special physical talent test, they entered the Department of Physical Education and Sports. Their physical capacity and competence can be predicted from these athletic life events in their lives. Furthermore, these physical attributes, which provide opportunities for individuals to develop their skills through physical activity and sports, positively influenced study participants' disaster preparedness self-efficacy beliefs, as research has shown that self-efficacy is an individual's belief in their ability to perform tasks or achieve goals (Bandura, 1997). Women who are active in physical education and sports are faced with societal constraints and expectations that may make it difficult for them to be accepted in sports based on established traditional gender roles. An additional reason for the greater self-efficacy of women in this study compared to men may be their success in navigating the complicated social acceptance process of becoming a physical education teacher, balancing societal expectations, and overcoming sexist attitudes and practices in society. In addition to these findings, some other studies have found that men tend to have higher self-efficacy for coping with disasters compared to women. In one of these studies, Cuesta et al. (2022) found that men's self-efficacy for disasters such as extreme weather, fire, earthquakes, and terrorist attacks was higher than that of women when they examined the levels of disaster preparedness of the citizens in Spain, France, Poland, Sweden, and Italy, all European Union member states. Although the researchers found that women had lower levels of self-efficacy than men, they attributed this to women having a more realistic assessment of their abilities. Another study examining the general disaster preparedness beliefs among Turkish teachers found that male teachers had higher self-efficacy beliefs for disaster preparedness than female teachers (Tın et al., 2021). Dasci-Sonmez and Gokmenoglu (2023) found that the self-efficacy beliefs of female and male teachers for earthquake preparedness were higher than the average and were similar when assessing the level of earthquake preparedness of teachers in the Turkish sample. Contrary to these findings, studies show that men have higher self-efficacy beliefs for disaster preparedness

compared to women. Newnham et al. (2017) examined perceptions of disaster preparedness self-efficacy of participants in a sample of Hong Kong and found that the self-efficacy beliefs of male participants were higher than those of females. Cvetković et al. (2018) conducted another study on disaster preparedness self-confidence and found that men's perceptions of disaster preparedness self-confidence were higher than those of women. While the demographic characteristics of the participants (such as age, education level, knowledge level, training, and disaster experience) can be used to assess the differences between the findings of these studies, it should also be noted that the relationship between self-efficacy belief about disaster preparedness and gender variables is not clear.

One of the other sub-dimensions of general disaster preparedness is the concept of cues to action, which refers to occasions, people, or things that prompt people to change their behavior concerning disaster preparedness (Haraoka et al., 2012; Inal et al., 2018). Cues to action concerning disaster preparedness can include a variety of things that encourage people to participate in preparedness activities, including receiving warnings, seeing others take action, or becoming aware of their vulnerability to disasters (Champion & Skinner, 2008; Rosenstock, 2000). In this study, female physical education teacher candidates reported higher levels of beliefs in action cues than male counterparts and beliefs in action cues related to disaster preparedness did not differ by their grade level studied. These results demonstrated that social cues and messages emphasizing collective action and the protection of others are essential in encouraging women's participation in disaster preparedness activities. In other words, if women receive warnings or see others taking precautions, they are more likely to perceive the threat as serious and to act on it accordingly. Furthermore, cues highlighting potential impacts on vulnerable populations, such as children or older adults, can significantly influence women's disaster preparedness (Fothergill, 1996; 1998). Research suggests that gender is an important factor in the relationship between gender and cues to action (Fothergill, 1998; Fothergill, 2003). According to related literature, men and women do not hear, believe, or personalize disaster warnings in the same way. Women are more likely than men to receive risk messages and respond with protective behaviors such as evacuation because of their social networks. Because of their social networks and roles, women are more likely than men to receive warnings from their peers, such as friends, neighbors, and family members (Enarson, 2000). However, males are more skeptical about the recommendations of their peers. Women are more likely than men to believe in disaster warnings and more likely to take emergency messages seriously. Women are also more likely than men to interpret, accept, and personalize warnings as legitimate. In the majority of the disaster situations, women are more likely than men to respond to warnings and alerts (Enarson et al., 2007; Fothergill & Peek, 2004; Tierney, 2007). In an educational setting, researchers examined the general disaster preparedness beliefs of teachers across Türkiye, and the results showed no difference between men and women in the cues to action sub-domain, and the score obtained was high (Dasci-Sonmez & Gokmenoglu, 2023).

Perceived susceptibility, which examines an individual's perception of the risk of experiencing a disaster or emergency, is another sub-dimension of general the disaster preparedness belief. Research on this issue shows that the perceived amount of risk has an impact on the level of individual disaster preparedness. People need to first feel that there is a risk for them to prepare, and if they feel that the risk is low, they will not think that they should do any preparation (Becker et al., 2013). According to the current study, gender has an impact on risk perception, and female physical education teacher candidates perceived disaster risk to be higher than male candidates. However, teacher candidates' perceptions of their susceptibility to disaster preparedness did not differ by grade level studied. Related literature on gender norms, with implications for disaster preparedness and safety, suggests that they may encourage greater "risk-taking" by men and "risk avoidance" by women. As a result, women's perceived risks were significantly higher than those of men (Enarson, 2006). Consistent with previous findings, female physical education teacher candidates in this study showed higher levels of perceived susceptibility than males. The likelihood of women perceiving a disaster or hazard as serious or

dangerous is higher than that of men, particularly when their family is at risk (Flynn et al., 1994). One of the studies carried out in this area examined the level of disaster preparedness among EU citizens and found that women's perceptions of the negative effects of disasters were higher than men's (Cuesta et al., 2022). The majority of the physical education teacher candidates participating in this study were either residents of Mersin, a province adjacent to those declared disaster zones following the 7.7 and 7.6 magnitude Kahramanmaraş earthquakes of 6 February, and experienced the adverse physical and psychological effects of the earthquake, or residents of the declared disaster zones, also experienced the earthquake in these zones, contributing to a higher level of perceived disaster risk. The literature on the subject has shown that people who have experienced and been affected by an earthquake have an increased perception of the risk of the disaster, and they have a higher perception of fear and life-threatening risk, depending on their perception of the possibility of the earthquake recurring (Espina & Teng-Calleja, 2015; Kung & Chen, 2012). Regarding gender, studies have found that women are more fearful and have more perceptions of life-threatening situations than men who have experienced an earthquake before (Ho et al., 2008; Kung & Chen, 2012). Tang and Feng (2018), examined the views of earthquake survivors on disaster preparedness in a sample from Taiwan and found that women had more behavioral intentions for disaster preparedness than men because they were more sensitive to risk, tended to perceive risk more than men, were more concerned about the safety of the environment in which they lived, and felt that they were at risk from earthquakes. After the Kahramanmaraş earthquakes, which caused more than 58,000 deaths in Türkiye alone, women's perception of the risk of earthquakes was higher than that of men. This is likely due to the higher risk perception of women and their recent exposure to earthquakes.

As a further sub-dimension of earthquake preparedness beliefs, Perceived Barriers include obstacles that are likely to hinder the person's perceived preparedness for earthquakes. The barriers perceived by physical education teacher candidates participating in this study differed by gender, but not by grade level studied, and the barriers perceived by females were more significant than those perceived by males. In a study that assessed the level of preparedness for earthquakes among people who had already been through an earthquake, participants' perceptions of barriers did not vary by gender (Arslanoğlu et al., 2023). Financial considerations, a lack of knowledge and skills, a lack of time, physical barriers, and a lack of importance were identified as barriers to disaster preparedness by participants in a study in the Philippines (Bollettino et al., 2018). Women face challenges in accessing knowledge and resources preparing for, responding to, and coping with disasters, including early warning, shelter, and bank accounts for protection and income (Erman et al., 2021). Cox (2022), investigating barriers to disaster preparedness among university students in the United States, found that time constraints were cited as a barrier to disaster preparedness by more than half of the students surveyed. According to the results of the Canadian sample, the main barriers perceived by university students to prepare for disasters are short-term shelter in the area where they currently live, cost, lack of experience, and the belief that the property will never be used (Tanner & Doberstein, 2015). Barriers to preparedness for unforeseen emergencies, including disasters, were explored in the American sample, and confusion about preparing for an unknown situation, not having the financial ability to cover the cost of the materials needed for preparation, not believing it is necessary to be prepared where they live, not knowing where to begin the preparation, and finding it difficult to work with the family on preparation were all identified as barriers that prevent participants from preparing for an emergency (Kruger et al., 2020). A study of Hong Kong disaster preparedness reported that barriers to better disaster preparedness included a lack of knowledge of where to access information, a belief that Hong Kong is relatively safe from disaster and that education to support this belief is unnecessary, and a lack of time for disaster preparedness (Lam et al., 2017). Tanner and Doberstein (2015) examined the disaster preparedness of university students in a Canadian sample and found that nearly half of the students, regardless of gender, grade level, or previous disaster experience, reported that there were barriers that prevented them from preparing for

disasters: living in a residential area for a short period, not being able to afford the cost of preparation, and believing that the preparedness materials will never be used again. In addition, research has shown that women's lower status in society and households, and the restrictions placed on women's freedom by traditional gender roles, prevent them from playing an active role in earthquake preparedness (Fothergill, 1996; Plan International, 2021; Petraroli & Baars, 2022). This evidence, together with data from the literature, suggests that men and women face different barriers to preparing for disasters. The nature of these barriers varies according to the characteristics of the sample being analyzed. According to the findings of this study, the unequal distribution of power and economic opportunities reflected in the traditional gender roles of Turkish culture is the reason why women's perceived barriers to disaster preparedness beliefs are higher than men's (The Global Facility for Disaster Reduction and Recovery, 2018).

Concerning another sub-dimension of disaster preparedness beliefs, the Perceived Benefits beliefs of physical education teacher candidates did not differ according to the gender of the physical education teacher candidates' gender or according to the grade level they studied. Disaster preparedness was perceived to be of greater benefit to physical education teacher candidates than average. Studies have shown that people's belief in the benefits of disaster preparedness and their belief in the possibility of disasters are among the factors that significantly influence their preparedness for disasters. In other words, the higher one believes in the likelihood of experiencing a disaster, the higher one believes in the benefits and likelihood of preparing for disaster (Motoyoshi, 2006). After the experience of the 7.7 and 7.6 magnitude earthquakes in Kahramanmaraş, physical education teacher candidates, regardless of gender or grade level, are expected to have positive perceptions of the benefits of disaster preparedness. These findings are supported by national and international research. Dasci-Sonmez and Gokmenoglu (2023), investigating the general beliefs of teachers in Türkiye regarding disaster preparedness, found that the perceived benefits of the participating teachers, regardless of gender, were higher than the national average.

Another sub-dimension of disaster preparedness included in the research was Perceived Severity, and it was found that the perceived severity scores of female physical education teacher candidates were higher than those of male teacher candidates, but there was no difference between the perceived severity scores of the teacher candidates based on the grade level studied. In addition to women having a higher perceived severity score, both men and women had a higher-than-average perceived severity score. Perceived Severity is a subjective assessment of the severity of the impact and potential consequences of a disaster. This theory suggests that people are more likely to take action to prevent (or reduce the severity of) the negative effects of a disaster if they perceive those effects to be severe. The perceived severity scores of the physical education teacher candidates in this study were more significant than the norm, as they had recently experienced the severe Kahramanmaraş 7.7 and 7.6 magnitudes earthquakes, which killed more than 50,000 people. Espina and Teng-Calleja (2015), in one of the studies on this topic, reported that the severity of the disaster experienced is an important factor in preparing for earthquakes. In the Turkish sample, the results of Dasci-Sonmez and Gokmenoglu (2023), who examined teachers' earthquake preparedness, showed no difference in perceived severity between male and female teachers, while the perceived severity level was moderate. The fact that the participants in this study had recently experienced the devastating Kahramanmaraş earthquakes on 6 February may explain the difference between the mean score perceived severity score obtained in the results of the study conducted by Dasci-Sonmez and Gokmenoglu (2023) and the mean score obtained in this study.

The findings regarding the general level of disaster preparedness beliefs of the physical education teacher candidates participating in the study showed that the level of beliefs of female teacher candidates was higher than that of the male teacher candidates. Meanwhile, the beliefs of the female and male teacher candidates about disaster preparedness did not vary by grade level. Furthermore, the

general disaster preparedness belief levels were found to be higher than average for both genders. Some of the studies conducted on this subject have found differences in disaster preparedness beliefs according to gender, while others have found no difference. One of the studies that found no difference between men and women in their disaster preparedness beliefs was carried out on a sample of university staff (Inal, Altintas, & Dogan, 2019). A further study, which found no difference between the general disaster preparedness levels of women and men, was carried out with the participation of teachers (Dasci-Sonmez & Gokmenoglu, 2023). However, Ertuğrul and Ünal (2020), examining the disaster preparedness beliefs of university students studying health, found that female students had a higher disaster preparedness beliefs level than male students. Yiğit et al. (2020), examining the disaster preparedness beliefs of medical and engineering students, found a gender difference in the disaster preparedness beliefs of the students participating in their research, with women having higher disaster preparedness beliefs than men. Similarly, international studies have found no gender difference in disaster preparedness beliefs. In the Philippine sample, perceived levels of disaster preparedness beliefs were similar for women and men (Bollettino et al., 2020). Cuesta et al. (2022) also found similar attitudes toward disaster preparedness between genders. Though studies on how gender affects preparedness behavior are scarce, Fothergill (1996) notes that some evidence suggests that women tend to be better than men at making their families and communities more disaster-resistant.

The latest natural disasters have highlighted the importance of disaster preparedness in all segments of society. The study suggests that raising awareness through direct or interdisciplinary courses is crucial, although disaster preparedness is not a top priority in the curriculum of higher education institutions (Coveleski, 2014; Dikmenli & Yakar, 2019; Matunhay, 2022). The research suggests that there is no significant difference in disaster preparedness beliefs among teacher candidates based on their grade level studied, emphasizing that the teacher training program lacks any information about disaster preparedness (Ozkazanc & Duman-Yuksel, 2015; Tekin & Dikmenli, 2021).

5. Limitations

The findings of the study have to be considered in light of some important limitations. One limitation was the selection bias of the sample regarding the population, as the majority of the participants lived or were, at the time of the study, in an earthquake zone or county where the serious negative effects of the quake are strongly felt. The small sample size and restriction to one university represent two of the study's limitations. Another limitation is that the convenience sample of participants is not necessarily representative of the wider community of potential physical education teachers. The sample for this study consisted of students intending to pursue a career in physical education teaching, and therefore, the findings of this study may only apply to university students with this status. Although this study provides valuable insights into the relationship between disaster preparedness beliefs, gender, and grade level studied, it does not consider the impact of other possible influencing variables. This study relies on the use of questionnaires for data collection, and errors or misunderstandings could affect the validity of the data collected. The study did not consider the effect of individual characteristics on disaster preparedness, such as prior knowledge, training, or motivation.

6. Conclusions

In conclusion, the physical education teacher candidates participating in this study were above average in their disaster preparedness beliefs, both in the sub-dimensions and the overall scale. Regarding general disaster preparedness beliefs and the sub-dimensions of Self-efficacy, Cues to Action, Perceived Susceptibility, Perceived Barriers, and Perceived Severity, it was found that females had stronger beliefs than males and there was no difference between the two sexes regarding Perceived Benefits beliefs. When physical education teacher candidates were examined in the grade level they are studying, it was found that the general disaster preparedness beliefs, Self-efficacy, Cues to Action, Perceived

Susceptibility, Perceived Barriers, Perceived Benefits, and Perceived Severity beliefs did not differ according to the grade level.

7. Recommendations

Future research should utilize larger samples to confirm the disaster preparedness beliefs of physical education teacher candidates. Additionally, future research ought to include a more extensive and diverse sample of university students from various backgrounds to allow for a more thorough assessment of disaster preparedness beliefs across the student population. Incorporating the other data collection methods, such as interviews, focus groups, and observations, could provide qualitative insights into the reasons for different disaster preparedness beliefs. Moreover, future research should investigate the relationships between students' demographic characteristics (e.g., age, faculty, department, and areas of residence) and disaster preparedness beliefs to determine if notable differences exist based on these criteria. Furthermore, the effectiveness of specific programs in increasing disaster preparedness beliefs should be explored in future studies. Given that the majority of participants in this study had experienced the effects of an earthquake, future research could address an important gap in the literature by comparing the earthquake preparedness beliefs of individuals with and without earthquake experience.

The results of this research have unveiled significant findings regarding the expression of beliefs about earthquake preparedness. For governments and policymakers in teacher education, the gender difference in the sub-dimensions of disaster preparation beliefs revealed by the research is noteworthy. To minimize gender differences in disaster preparedness beliefs, policymakers should take the necessary measures at both social and educational levels. Furthermore, to foster positive disaster preparedness beliefs to the fullest extent possible, relevant training, public service announcements, seminars, and general education should be made accessible to all segments of society. Additionally, the results of this study suggest that the knowledge and positive beliefs of teacher candidates towards disaster preparedness should be enhanced through materials provided directly or indirectly in teacher education programs.

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Research Article

Evaluation of Interventions for Individuals with Special Needs After an Earthquake: Teacher Perspective

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Abstract: Türkiye is in a geography where many large and small-scale earthquakes occur due to its location in the earthquake zone. The Kahramanmaraş earthquake on February 6, 2023, and the Hatay earthquake on February 20, 2023, affected individuals with special needs and their families as well as individuals with typical development. This research aims to determine the experiences of experts who meet/support individuals with special needs and their families in the earthquake zone or any province and their recommendations regarding future disasters. Therefore, focus group interviews were conducted with five special education teachers and a psychological counsellor. According to the results of the research, four themes were reached: the needs, the difficulties, the positive aspects of interventions for individuals with special needs after the earthquake and recommendations for a future earthquake. The results obtained from the findings of this study were discussed together with previous studies in the literature and suggestions were made regarding before, during and after disasters.

Keywords: Earthquake, Türkiye, Disability, Disaster, Teachers, Special Education Teacher, Focus Group Interview, Individuals with Special Needs

1. Introduction

Earthquakes are natural disasters that cause serious consequences in many regions of the world. Earthquakes often present traumatic experiences to living beings and affect their lives (Turcotte, 1991). Türkiye, located in the zone of Northern Anatolia, Eastern Anatolia and Western Anatolia fault lines, is a country that has experienced many earthquakes. According to the report of the Strategy and Budget Directorate of the Presidency of the Republic of Türkiye, on February 6, 2023, two earthquakes with magnitudes Mw7.7 (focal depth = 8.6km) and Mw7.6 (focal depth = 7km) occurred at 04:17 and 13:24, with the epicentre in Pazarcık and Elbistan districts of Kahramanmaraş. On February 20, 2023, at 20:04 Türkiye time, an earthquake of Mw6.4 magnitude occurred with the epicentre in Hatay Yayladağı. These earthquakes caused great destruction in 11 provinces in total. As a result of the earthquakes, more than 48.000 people lost their lives, more than half a million buildings were damaged, communication and energy infrastructure were damaged, and significant financial losses occurred. In addition, the report includes the number of individuals with special needs registered in the earthquake zone; the total number is 2,511,950, including 1,414,643 men and 1,097,307 women. The number of people with severe disabilities and special needs is 775,012. In the region, 5,252 people receive services in 66 disabled and elderly care centres affiliated with the Ministry of Family and Social Services. Considering the numbers, there are a significant number of individuals with special needs and their families affected by earthquakes, as well as experts working with individuals with special needs. Disaster experiences of individuals with special needs may be more severe and longer lasting than those of populations without special needs. When disasters occur, individuals with special needs face inequalities in accessing housing or assistance, and their educational processes become more difficult (Alexander, 2015).

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According to the report of Ankara Yıldırım Beyazıt University, Migration Policy and Research Center (2023), the size of the population leaving the region after the earthquake is larger than the human mobility subject to internal migration within Türkiye throughout 2021. It was determined that approximately half of the population of Adıyaman and more than one-third of the population of Hatay, Kahramanmaraş and Malatya were displaced. With this wave of migration, there are individuals with special needs and their families who migrate to other cities, as well as individuals with special needs and their families who stay in the earthquake zone and continue their lives in this region. While there are special education teachers who work voluntarily with individuals with special needs in the cities of migration, there are also special education teachers and counsellors assigned to children with special needs and their families in the earthquake region by the Ministry of National Education and the Ministry of Family and Social Policies. In addition to the assigned teachers, there are also special education teachers, counsellors and subject teachers who provide education to individuals with special needs and support families in the earthquake zone voluntarily (Özer, 2023). The purpose of this study is to specify the experiences of experts who meet/support individuals with special needs and their families in the earthquake zone or any province and their recommendations regarding future disasters. For this purpose, in the first six months after the earthquake, teachers working with individuals with special needs or their families in the earthquake region or in the provinces where individuals with special needs migrated were contacted. In addition, the research conducted in Türkiye and the world regarding individuals with special needs and disasters was considered. According to the studies conducted in Türkiye, spatial planning for individuals with special needs during the disaster process (Orhan & Keskinok, 2019), the safety of individuals with special needs in disasters and the importance of dogs in reducing disaster damages (Biçkin, 2020), disaster management model for earthquakes sensitive to individuals with disabilities (Türk, 2022), safety of individuals with special needs during an earthquake (Pakalın & Mersin, 2023), use of geographical information systems and network analysis methods in access solutions for individuals with disabilities (Tün et al., 2019), disaster challenges for individuals with special needs and their parents: 2011 Van Earthquake example (Bilik & Akdağ, 2023), determination of the intervention process of the national medical rescue team (UMKE) for individuals with special needs in disasters and emergencies (Gönen, 2022), the effectiveness of video model on teaching earthquake safety skills to individuals with mental disabilities (Musaoğlu, 2022), the effectiveness of video modeling in teaching earthquake and postearthquake evacuation safety skills for children with autism (Kurt et al., 2024) are included. Moreover, the international studies were about the participation and quality of life of individuals with physical disabilities due to earthquakes (Nunnerley et al., 2015), investigation of the abilities of individuals with special needs to cope with disasters (Ton et al., 2020), preparation and intervention for individuals with special needs in times of disaster after the great East Japan earthquake and difficulties encountered in relief efforts (Tatsuki, 2012), changes in the social relations of individuals with disabilities displaced by disasters (Stough et al., 2017), disability in post-earthquake Haiti: prevalence and inequality in access to services (Danquah et al., 2015), disability and disaster management in New Zealand: examining online media messages (Hay & Pascoe, 2019). When the previous studies are examined, it is seen that they are review studies and designed as fact-finding and suggestions. However, there is no study on the experiences of special education teachers who provide support to individuals with special needs and their families in the earthquake zone after a disaster or earthquake.

This study aims to determine the experiences of teachers who meet/support individuals with special needs and their families in the earthquake zone or any province and their recommendations regarding future disasters. Therefore, the following questions were sought:

1. What are the needs that teachers observe when providing support to individuals with special needs and their families affected by the earthquake?

2. What kind of support did the teachers provide and with whom did they collaborate in the process of meeting the needs?

3. What difficulties did teachers encounter while working with individuals with special needs and their families in the post-earthquake period?

4. What are the good practices observed by teachers when working with individuals with special needs and their families in the post-earthquake period?

5. What kind of experiences did teachers working with individuals with special needs and their families gain in the post-earthquake period?

6. What kind of professional support did teachers need during their work with individuals and families with special needs?

7. What kind of work do teachers think should be planned with individuals with special needs and their families before and after the disaster?

2. Method

In this section, information about the research design, participants, how the data were obtained, how the data were analysed and ethical issues are detailed.

2.1. Research model

This research, which aims to determine the experiences of experts who meet/support individuals with special needs and their families in the earthquake region or any province and their suggestions regarding future disasters, was designed according to the phenomenology model, a qualitative research method. Phenomenological research design is widely used as one of the qualitative research methods that aims to relate people's perspectives, perceptions and experiences between phenomena and reveals how participants perceive, define and feel the shared experience (Patton, 2002). In this context, the research was conducted with a focus group interview to discuss teachers' experiences in detail and multi-dimensionally.

2.2. Participants

In this research, a focus group interview was held with six teachers who work in the field of special education, had a bachelor's degree in special education, and had a device and internet connection to conduct online interviews. The names of the participants were coded based on the initials of their names. Information about teachers is given in Table 1.

Table 1

Demographic Information of Teachers

Participants	Gender	Profession
Participant V.	Male	Special Education Teacher
Participant F.	Male	Special Education Teacher
Participant M.	Male	Guidance and Psychological Counselling
Participant Ö.	Female	Special Education Teacher
Participant E.	Female	Special Education Teacher
Participant S.	Female	Special Education Teacher

Five of the teachers are special education teachers while one of them is a guidance and psychological counsellor. All of the teachers temporarily volunteered as teachers in the post-earthquake period.

2.3. Data collection and analysis

The research was designed according to the phenomenological model, which is one of the qualitative research methods. The reason for choosing this model is that it focuses on the experiences of individuals. This research aims to interpret and discuss the experiences of teachers assigned to the earthquake zone. In this direction, it was aimed to examine the experiences of teachers in depth in an interactive way through focus group interviews. One of the techniques frequently used in Qualitative Research is Focus Group Discussions, which are group discussions in which a subject that is of interest to the researcher and under his guidance is examined by a group. In focus group interviews, the answers of the participants emerge through their interactions with each other. Focus group interviews emerge as a preferred research technique in different fields, with many features such as revealing interactions between people and allowing in-depth data to be obtained (Sevim, 2008). The interview questions to be used in the focus group interviews were prepared by the researchers and the opinions of three experts with doctoral degrees working in the field of special education were obtained. Following expert opinions, necessary edits were made, and the questions were finalized. To determine the participants in the research, special education teachers assigned to the earthquake region were interviewed and information was given about the content of the research. Teachers who wanted to participate in the research were contacted and the interview time was determined. The meeting was held online via Zoom application. Before the interview, information was given about the purpose and content of the study and participation approval was obtained for participation in the study. The teachers participating in the research were informed again about the purpose and content of the research at the beginning of the interview, they were told the interviews would be recorded and their names would be kept confidential.

After the focus group meeting, the recordings were transcribed without any changes to the participants' conversations. The transcripts were listened to and checked by an expert with a PhD degree in the field, and it was requested to examine whether there was a match between the voice recordings and the transcription. Based on the investigation, it was observed that there was no discrepancy. Following this process, the interview data was analyzed. Content analysis technique was used in the analysis of the data obtained from the interview. In the analysis, the processes of coding the data, reaching themes from the codes, and rearranging and defining the obtained data according to codes and themes were carried out. As a result of the analysis, four themes and subthemes were reached.

2.4. Validity and reliability

The themes and sub-themes obtained from a focus group interview were re-examined independently by an expert with a PhD in special education. After the review, the themes were reviewed by the experts and the researchers together and the inter-coder reliability compliance percentage was determined. The formula suggested by Miles et al. (2014) was used to calculate inter-coder reliability. Inter-coder reliability was found to be 95%.

2.5. Ethics issues

An Ethics Committee Approval was obtained from the Istanbul Kültür University Ethics Committee for this research, which aims to determine the experiences of experts who meet/support individuals with special needs and their families in the earthquake zone or any province and their recommendations regarding future disasters. The research title is "Evaluation of Interventions for Individuals with Special Needs After the Earthquake: Teacher Perspective", the decision number is 2023/99 and the date information is 21.06.2023.

3. Findings

After the interviews conducted in the research, four main themes and their sub-themes were reached. The main themes are shown in Table 2.

Table 2

Teacher Opinions Main Themes

Main Themes
1. Needs after the earthquake
2. Difficulties after the earthquake
3. Positive aspects of interventions for individuals with special needs after the earthquake
4. Recommendations after an earthquake

The main themes were handled as sub-themes and codes. Firstly, the theme of needs after the earthquake and sub-themes of this theme are given.

3.1. Needs After the Earthquake

As a result of the content analysis, one of the main themes was identified as needs after the earthquake. The needs expressed by the participants are grouped under the headings of needs for individuals with special needs, needs of families and needs of volunteers. The sub-themes are shown in Table 3.

Table 3

Needs After the Earthquake

Sub- Themes
1. Needs for individuals with special needs
2. Needs of families
3. Needs of volunteers

Sub-themes and codes related to needs after the earthquake are given in detail. Firstly, the needs of individuals with special needs are addressed.

3.1.1. Needs of individuals with special needs

In the process after the earthquake, individuals with special needs were affected in many ways. Two prioritized needs stood out in the interview conducted with the participants. Considering the post-earthquake conditions, participants stated that it is important to organize routines and provide access to devices designed specifically for individuals with special needs, after meeting the priority needs of each individual, such as shelter and nutrition. The codes are shown in Table 4.

Table 4

Needs of Individuals with Special Needs

Codes	f
1. Organize routines	6
2. Provide access to devices	4

Stating the role of routines in regulating emotions and behaviours for individuals with special needs, Participant V. emphasized the effect of creating routines on the "acceptance of life there". Participant E. said "routine" was the most important need, and then, due to the constant change of volunteer teachers assigned to special needs, he emphasized the importance of organizing individuals' routines. In addition, the statement: "We were having difficulty accessing devices" by Participant Ö. shows that the need for devices came forward, especially in the third week after the earthquake.

3.1.2. Needs of families

In the period after the earthquake, not only individuals with special needs but also their families were affected in many ways. Two needs are prioritized by the participants. The needs of families are grouped under the headings of accommodation conditions and psychosocial support. The codes are shown in Table 5.

Table 5

Needs of Families

Codes	f
1. Accommodation conditions	5
2. Psychosocial support	3

The most basic consequence of the earthquake is the housing problem, which is also a primary need for families with children with special needs. Making children with special needs feel comfortable and safe in their routines has an important role in their learning and development. On the other hand, having to leave their safe areas has further increased the difficulties for individuals with special needs and, as a result, their families. For this reason, the importance of the need for shelter has increased even more. Participant E., based on his own tent city experience, emphasized the negative impact of the process on individuals with special needs by saying "...There was also wind blowing for 4 days. We couldn't sleep, and as much as we were affected, the children with special needs were even more affected". On the other hand, the inadequacy of accessibility regulations in shelter areas was expressed by participant Ö. with these words:"... I worked hard to build a ramp in my camp.". Families of individuals with special needs have needed priority accommodation arrangements due to the special needs of their children. Participant S., while expressing the needs of the families, said, "You know, the families had so many needs that they also had a lot of needs in terms of shelter, food, drink or financial resources." and emphasized the needs of families regarding basic needs. It is seen that the earthquake caused mental/psychological damage as well as financial loss. Regarding the needs of the families, volunteer teachers stated the need for psycho-social support immediately after the need for shelter. Participant M. said "Especially families need psychoeducation. In other words, we saw that they were in the process of making sense of the event." In the words of participant S., "The need for social or psychological support seemed very clear, I can express it as briefly as possible.", the importance of psycho-social support was emphasized.

3.1.3. Needs of volunteers

In the post-earthquake period, many teachers and experts volunteered in the provinces of the earthquake region. Three needs stood out in the prioritized needs of volunteers in the earthquake zone. Participants listed their needs in the earthquake regions where they voluntarily went, and these needs are classified under the headings of training for disasters, psychological support, and training for communication with parents. The codes are shown in Table 6.

Table 6

Needs of Volunteers

Codes	f
1. Training for disasters	6
2. Psychological support	4
3. Training for communication with parents	2

The most highlighted need was disaster training. Participants stated that they should be more prepared about what to do in the earthquake region and who will be responsible and authorized for what. Participant E. said "Training needs to be given. How can it be coordinated? ...Who can take part?" participant F. said, "We need disaster training, no matter what.".

Another need was expressed as the inadequacy of psychological support for those providing support. Regarding the difficulty of the process, participant Ö. said "I was lost for a moment, I mean lost like a state of trauma." Volunteers who did not feel adequately informed and supported stated that they needed psychological support as part of the process. Participant F. said "You know, specifically, my professional needs are not as a special education teacher, but as an individual. I also felt a need to know how to treat people who experience disaster." and emphasized the need for the psychological dimension of the process.

The last need expressed by participants was training for communication with parents. The majority of the teachers who participated in the interview and who had met and worked with individuals with special needs in the earthquake region by assignment were special education teachers. However, since teachers work one-on-one with children with special needs under normal conditions, they stated that difficulties related to the psychological condition and communication with families were observed in the post-earthquake period. Therefore, communication training with parents should be considered as a part of disaster training. Participant Ö. stated the need for support regarding communication with families as follows:

> "... I felt the lack of it a little bit. So, how should we communicate with parents during this disaster period? So, children with special needs are like eating and drinking for us now. We do this very easily, but I think a special education teacher who does not meet parents every day might have a little difficulty in that process. That's why disaster training had to be given to us on a parent basis."

3.2. Difficulties after the earthquake

In the study, the theme of difficulties after the earthquake was identified as the second theme. The difficulties stated by the participants regarding the process were parents' limitations in recognizing and expressing their needs, planning, coordination, and communication. The sub-themes are shown in Table 7.

Table 7

Difficulties After the Earthquake

Sub- Themes
1. Parents' limitation in recognizing and expressing their needs
2. Planning
3. Coordination and communication

Sub-themes and codes related to difficulties after the earthquake are given in detail. First, the limitations of parents in recognising and expressing their needs are included.

3.2.1. Parents' limitations in recognizing and expressing their needs

Families' inability to recognize their needs and inability to express their needs were identified as sub-themes of the theme related to the difficulties experienced after the earthquake. Two headings stood out in this sub-theme. In this region, it was seen that families are not aware that they can demand their needs from the state and that they do not know their rights.

Table 8

Parents' Limitations in Recognizing and Expressing Their Needs

Codes	f
1. Failure to recognise needs	2
2. Inability to express their needs	2

Participant F. summarized this situation with a striking expression regarding the habits before the earthquake with the statement: "The people there naturally learned not to need it before...". Another statement from Participant F. shows that parents of children with special needs experience limitations in recognizing and expressing their needs in rights-based ways:

> "..... You being here right now is the highest quality service I have ever received for my child. ...Families don't need anything. ...We're asking if you don't want a tent, they're sleeping in the car. Well, sir, we are getting by our house has not been demolished here anyway, but we are taking precautionary measures. So, we manage. A child with autism does not stay in a public area. Because it makes noise, they don't even ask for it. So, at this point, we have a little bit of learned helplessness. While it is generally accepted in our country, it is even more hurtful for me to see this in the earthquake zone."

3.2.2. Planning

Another sub-theme of the theme of difficulties after the earthquake is planning. Five headings stood out in the sub-theme of planning. Planning was examined in the dimensions of not having an emergency/action plan, inadequate job descriptions, not having sufficient knowledge and experience, authorities not knowing/understanding the needs of individuals with special needs for the management of resources, and not meeting the psychological support needs of volunteers.

Table 9

Planning

Codes	f
1. Not having an emergency/action plan	6
2. Inadequate job descriptions	3
3. Not having sufficient knowledge and experience	2
4. Authorities not knowing/understanding the needs of individuals with special needs for the management of resources	2
5. Not meeting the psychological support needs of volunteers	2

The lack of an emergency/action plan was stated as the most frequently mentioned difficulty by the participants. Volunteering with limited knowledge and experience about the possible problems of individuals with special needs and their families regarding the situations that may occur before and after the earthquake and the solution to these problems was identified as the most fundamental difficulty of the process. Participant M. "When we look at what can be done about individuals with special needs, crisis management, disaster and emergency management should be a system approach. In other words, any deficiency in the system does not accept mistakes, unfortunately." emphasized the importance of the emergency/action plan in the pre-disaster planning process. Participant F. "We really need a scaffolding on how we will act there. It is prepared in advance. I mean, I will know that when I go there from Istanbul, such and such people can solve my problem there before I even think about it. You know, this is what we needed there...", he emphasized the importance of planning to ensure the healthy functioning of the process in terms of quality volunteer support by defining job descriptions in advance while taking knowledge and experience into consideration. Participant Ö. expressed the inadequacy in job descriptions, which is the second difficulty related to planning, and the obstacle to the correct use of volunteer resources with the expression "I got into a great mission confusion. Maybe we criticize so much, which I criticized a lot when I was there, maybe we were the person there, I mean we were the main person, I mean we were the one who should see the needs of the family there...". The lack of planning also emerged as an important factor in the process of proper resource management and caused volunteers to solve problems by taking the initiative against the lack of specification in their duties and responsibilities. Participant V. summarized this situation with the following statements:

> "In Hatay, we had a special educator unit responsible for the whole province and three or four colleagues who constantly travelled to the field. When we had a shortcoming or a need, we would first share this problem with them. They would meet with the authorized brothers and sisters in quotation marks instead of us. But there was such a density and disconnection that sometimes you had to take the initiative anyway."

One of the main reasons for taking this initiative is the lack of planning based on knowledge and experience, as mentioned before, as well as the insufficient knowledge of the authorities about the needs of individuals with special needs. Participant Ö. exemplified the inadequacy of the authorities in knowing and understanding the needs of this field with the following statements:

> "I mean, for example, a special tent for someone with autism. For me, it was an essential thing, or he wanted the tent next to his grandmother. But his interlocutor, the unit distributing the tents, treated it as a very luxurious need. Apart from that, he wanted a device, or he needed to have his glasses checked, he has a visual impairment, he has low vision, again, this was met as if it was a great need, a great luxury."

Finally, Participant E. emphasized the importance of volunteers receiving psychological support as part of the planning: "I came here to help, I need to recover. ...We are sleepless for four days, but we need to help the children. This is what we need to do. I have seriously suppressed it in my subconscious mind." She stated the importance of the psychological dimension of the process.

3.2.3. Coordination and communication

The last sub-theme of the difficulties after the earthquake is coordination and communication. In this sub-theme, seven headings stood out. These seven headings are as follows: the process proceeding mainly with local resources and personal efforts, failure to establish healthy relations with non-governmental organizations (NGOs) and volunteer organizations, disruptions/conflicts in communication and cooperation between institutions, difficulty in reaching the authorities, the inability

to reach families not in tent cities, difficulties in storing and delivering materials and attempts to intimidate volunteers.

Table 10

Coordination and Communication

Codes	f
1. The process proceeding mainly with local resources and personal efforts	6
2. Failure to establish healthy relations with NGOs and volunteer organizations	5
3. Disruptions/conflicts in communication and cooperation between institutions	4
4. Difficulty in reaching the authorities	3
5. The inability of aid to reach families not in tent cities	1
6. Difficulties in storing and delivering materials	1
7. Attempts to intimidate volunteers	1

The most highlighted difficulty related to coordination and communication is the process proceeding mainly with local resources and personal effort. Participant Ö. explained the importance of personal efforts in the process as follows:

> "We learn from her parents that s/he kidnapped the child underneath. S/he needs more clothes because s/he's lost underneath. Only I can understand that this is a real need. We were forbidden to get the phone number under normal circumstances. I took the initiative and got the phone numbers of the authorities. If I hadn't insisted on that if it had not been my individual effort...
>
> …I asked the governor for the hearing aid of the student I'm talking about with hearing impaired, for example. I stick to the governor. I told the student that he needed a hearing aid, so the governor could supply it. That's how hearing aids came in. I mean, whoever came in like this had to tell him to...But when it was just said and left, that need wasn't addressed. Because there's a lot of need, and only we could see the most necessary needs, and that's the disruptive thing that came somewhere, from my point of view, with an entirely individual effort."

The second most mentioned theme is the failure to establish healthy relations with NGOs and volunteer organizations. For this theme, participants stated that they did not see NGOs working in the field of disability in the region. Participant M. expressed; "I also saw that there were some NGOs in the places I worked, but I had never noticed an NGO directly related to special education. So, I don't remember at all."

Another frequently mentioned theme is disruptions/conflicts in communication and cooperation between institutions. The Participant Ö. emphasized the disruptions/conflicts in the communication and cooperation with the following words:

> "The bureaucracy has a tremendous number of bureaucracies. There's bureaucratic fighting, and we tried to do our job in that fight. Actually, I've used this bureaucratic struggle somewhat in my interest, in the interests of the children. So, I could have crushed it under this, I could be ego and do something, but now we're in a mode where somebody does what my teacher V said, and whoever does whatever. In that bureaucratic struggle, the National Ministry of Education's poster is falling over the tent. Family Social Policies hanging. Aaa minister's coming. He sees the tent. Hoppa (sounds of surprise) tents are changing again. So we've been dealing with these little things."

Another sub-theme identified within the coordination and communication theme is the difficulty in reaching the authorities. Participant V. stated this problem as follows: "There was a problem with the interlocutor. You know, apart from that, everything was there. But I can say that there was no qualified staff to organize this." Participant F., on the other hand, expressed the difficulty in reaching the authorities as follows: "... when we wanted to establish a library... We told everyone, and then someone got the idea and sent a tent. But we told 20 people to get it done." Since it was difficult to reach the authorities, volunteers stated that they exhibited behaviours to solve problems by taking initiative or making more effort.

Other mentioned themes are listed as "failure of aid to reach families not in tent cities", "difficulties in storing and delivering materials" and "attempts to intimidate volunteers ". The tent that the participants expressed under the theme of "difficulties in storing and delivering materials" is also striking in terms of explaining the obstacles in reaching aid to those living outside the city. Participant V. said the following regarding this issue.

Difficulty in coordination and communication is the substantial amount of materials and resources, while there are difficulties in storage, recording the inventory, and rapidly identifying the need. Participant V. "But except that, I saw material that I didn't see in Istanbul. Something's really been sent out. But there's no place to put it or anyone to direct it." The statements illustrate the difficulty in coordination. Under the heading of attempts to intimidate volunteers, Participant E. stated the following; especially long-term assignments were made, and volunteers were told to work on weekends.

3.3. Positive aspects of post-earthquake intervention for persons with special needs

In the study, the positive aspects of interventions for individuals with special needs after the earthquake were identified as the third theme. Three sub-themes were found in this theme. The positive aspects of the interventions are summarized in the subheadings: the positive aspect of the practices presented, the positive aspects of collaborations and the positive aspects of volunteers' contributions. The sub-themes are shown in Table 11. Among these three sub-themes, the sub-theme related to the positive aspect of the interventions and the processes related to the codes of this sub-theme were included in detail.

Table 11

Positive aspects of interventions for individuals with special needs after the earthquake

Sub- Themes
1. The positive aspect of the interventions
2. Positive aspects of collaborations
3. Positive aspects of volunteers' contributions

Firstly, information on the sub-theme related to the positive aspect of the interventions will be given.

3.3.1. The positive aspect of the interventions

When the sub-theme of the positive aspect of the interventions is examined, three headings stand out. The positive aspects of the proposed practices relate to the practices presented, some of which the interviewed teachers considered positive in terms of interventions offered to individuals with special needs after an earthquake. In this context, participants mainly mentioned that the application and the environment are inclusive. The codes are shown in Table 12.

Table 12

The Positive Aspect of The Interventions

Codes	f
1. Inclusive application and environment	5
2. To be supported by counselors	3
3. The effort and dedication shown by the volunteers	3

"In fact, it was the most beautiful encompassing environment I've ever seen in my place," said participant Ö. “There's a handicapped, hearing impaired, small, big. And the activities of the guide teachers are well suited to the already inclusive activities.” that supports the situation. It has been observed that another positive aspect of the presented applications is meeting basic needs. Ö. and E. stated that the basic needs of people and volunteers in the earthquake zone, such as food and clothing, were met. Similarly, it was stated by the participants that there are materials and equipment that can meet special education needs. Participant Ö. explained this situation with the words "The material already has great material support." Other positive aspects of the offered applications were found to be related to volunteers. In this context, the participants stated that they were informed about the difficulties that may be encountered and therefore they went to the earthquake zone prepared.

In addition, participants pointed out that they were supported by guidance counsellors as another positive aspect. F., one of the participants said:

> "We were able to notice this situation immediately when I collapsed, for example, but they (guidance counsellors) might not have noticed it." "If it weren't for them, or if we went there as teachers, maybe we would only have problems as special educators."

The last positive aspect of the practices was found to be related to the effort and dedication shown by the volunteers. About this situation, Participant Ö. expressed: “Because there is so much need. And only we were able to send the essentials for this, this was the hurtful thing, in my opinion, we got somewhere completely with individual efforts” and F. used the expressions:

> “We were a team, if we were going to argue in the evening, we argued. But in the morning, we continued our work where we left off. We proceeded with the mentality that we would continue perfectly. And that's why I can say that we made a difference in the tent city, for example.”

3.3.2. Positive aspects of collaboration

The second sub-theme of this theme is the positive aspects of collaborations. Some of the positive aspects that the participants mentioned regarding the interventions offered to individuals with special needs after the earthquake are related to collaborations. In this context, it was observed that the participants talked about the positive aspects of the cooperation between institutions, organizations, and volunteers. The codes are shown in Table 13.

Table 13

Positive Aspects of Collaboration

Codes	f
1. The positive aspects of the cooperation between institutions and organizations and volunteers	4
2. Strong communication and coordination among volunteers	4

For example, Participant V.: “Well, sir, rather than this issue, there were many organizations around us that I cannot think of right now, such as the ministry institutions, the Ministry of Family and Social Policies, the Ministry of Religious Affairs, and there were many things with them. "We had a nice interaction," he said. Similarly, participant M. said, “We were directing them to state the needs with AFAD, which is responsible for that tent city or container city. We had cooperation with the Red Crescent. We were guiding how to contact the Red Crescent if there was anything related to the archive service in terms of direct logistics…”.

In addition, participants stated that there was strong communication and coordination among volunteers. Participant Ö., for this reason, “My friends and I agreed, so in terms of collaboration in general, having everything together was something I really liked. It's the fact that everyone is helping each other, you bring it to him, it's accessible. You immediately go to the back and say, "Oh, there is such a person." "From there it had a nice accessibility." Participant F. said, “Think of it like a cog in the machine. We entered and exited directly there. We did it for a week and the families all knew it. When they are gone, those who replace them will be just like them. Very good. "There was such an environment." By using these expressions, participants emphasized that volunteers also have a strong interaction with families.

In this context, one of the participants, E., stated that the families are in a better psychological situation because they feel that they are not forgotten, that they have serious interactions with the families and that they still meet with the families. Finally, one of the participants mentioned the positive aspects of cooperating with NGOs. To indicate this, participant V. said, “I worked with NGOs, we worked very actively with one NGO, in particular. The Pikolo Association was founded there and is against child labour. "There was a Pikolo Association in Küçükdalyan, while I was trying to set up the special training tent, we got all our data from them."

3.3.3. Positive aspects of volunteers' contributions

The third sub-theme of this theme is the positive aspects of volunteers' collaboration. Some of the positive aspects of the interventions offered to individuals with special needs after the earthquake are related to the contributions of volunteers. In this context, the volunteers' contributions were directed towards both the families and the volunteers themselves. The codes are shown in Table 14.

Table 14

Positive Aspects of Volunteers' Contributions

Codes	f
1. Contributions of volunteers to families	5
2. Contribution of volunteers to volunteers	3

One of the contributions of volunteers to families was their relief. The expressions in the following lines support this situation:

> "The forty-five-minute session I gave there did not have a great importance for me, but the happiness and peace in those families was a very satisfying feeling for me." (Participant V.);
>
> “The fact that we were able to organize the children in such situations and create an environment to meet with the families made the families very comfortable during that week.” (Participant F.)

Participants also stated that their contributions enabled them to recognize and express the needs of families. Finally, the participants stated that families outside the tent city could not receive aid and that these families also received aid with their contributions.

Participants reported that their volunteer work brought some benefits for them. The first of these was professional satisfaction. V., one of the participants, made the following statement regarding this: "As an individual, I realized that I was really a teacher there. I achieved professional satisfaction." M., one of the participants, said, "I was really satisfied professionally... I really thought I was useful to people." In addition, one of the participants, V., stated that volunteering contributed to making good friends as follows:

> "I made very good friends because that was my idea anyway. The person who comes there has no expectations and is a person who knows himself, thinks and questions. As I said, I made very good friends."

4. Recommendations after the earthquake

Another theme that emerged as a result of the analysis of the data was recommendations. Participants' suggestions for planning or implementation for similar emergency and disaster situations can be listed as NGOs working more and increasing their visibility, politicians, NGOs, and researchers working in cooperation, creating a digital data system, organizing disaster training, and drilling and simulation studies. The codes are shown in Table 15.

Table 15

Recommendations After the Earthquake

Codes	f
1. NGOs working more and increasing their visibility	5
2. Co-operation between policy makers, NGOs and researchers	4
3. Creation of a digital data system	4
4. Organizing disaster education	4
5. Drill and simulation studies	2

The most highlighted recommendation is for NGOs to work more and increase their visibility. Ö., one of the participants, expressed her suggestions that NGOs should work harder and increase their visibility in similar emergencies and disasters:

> "As I said, NGOs will do this, maybe we will do this. Maybe NGOs need to increase their visibility. I don't know, we need to somehow show that we can work together. Or we should be able to do this. This is how we talk when I think about what can be done for the future. It could have been the work of NGOs."

Another suggestion from the participants was that politicians, NGOs and researchers should work in cooperation. The expressions in the following lines support this: "So I think it would be very nice. Other than that, I think all the things we talked about come together in one thing. Policymakers, NGOs, and researchers working together. Researchers are angry with the Ministry of Education. The Ministry of Education has an attitude towards NGOs. Because some things are doing things that make a splash. Of course, these are beautiful. In other words, there are maybe four or five networks in this business. I wish we could work together. I wish we had a common network." (Participant Ö.).

Another suggestion from the participants during the interviews was to create a digital data system. Regarding this, one of the participants, Ö. He used the following expressions.

> "The duty of the Guidance Research Centre (GRC) should have been to give me information. There is a great resource out there. GRC has everything in their hands, from your address to your phone. So maybe if there was a tab like this… I mean, paper after paper, file after file, and all of that is in the system. Why couldn't we get them? So, these would look like a small tab. It's easy when you get into technology."

Another suggestion is to organize disaster education. Participants stated that disaster training should be organized for similar emergencies and disaster situations. Regarding this, "We need disaster education, no matter what it is" (Participant F.) and "So how should we communicate with parents during this disaster process? … I think a special education teacher who does not meet parents every day might have a little difficulty in that process. Therefore, disaster education had to be given to us on a parent basis" (Participant Ö). The last suggestion of the participants was drill and simulation studies. S., one of the participants, offered this suggestion with the following words:

> "With simulation studies if children go through this process… drills are being carried out. Simulation studies have also been conducted on children with special needs. And it seems that these have created very serious differences, and in some countries, very serious solution plans have been prepared based on these, as F. said, action plans have been prepared."

5. Discussion, Results and Suggestions

In this study, it was aimed to determine the experiences of the experts who met with/supported individuals with special needs and their families in the earthquake zone or any other province and their suggestions for future disasters. In line with this goal, a focus group interview was conducted. As a result of the interview, four main themes were identified: needs after the earthquake, difficulties after the earthquake, positive aspects of interventions for individuals with special needs after the earthquake and recommendations after an earthquake. When the theme of needs after the earthquake was examined, the sub-themes of needs for individuals with special needs, their families and volunteers emerged. When we look at the needs of individuals with special needs, it is noticeable that they have needs such as the organization of routines and access to devices; when we look at the needs of families, we see that they need the organization of shelter conditions and psychosocial support; and when we look at the needs of volunteers, we see that they need disaster training, psychological support and communication training with parents. When the theme of difficulties after the earthquake is examined; the limitations of parents in recognizing and expressing their needs, planning, coordination, and communication sub-themes were reached based on the difficulties stated by the participants regarding the process. Participants identified the lack of an emergency/action plan as the most important challenge in the process. In addition, it is seen that families do not have a rights-based perspective and need information on what they should demand in this process. In the planning sub-theme, difficulties such as the lack of an emergency/action plan, insufficient job descriptions, not having enough knowledge and experience, authorities not knowing/understanding the needs of individuals with special needs for the management of resources, and not meeting the psychological support needs of volunteers were identified. In the sub-theme of coordination and communication, difficulties in reaching the authorities, the process proceeding mainly with local resources and personal efforts, the inability to reach families not in the tent city, difficulties in storing and delivering materials, disruptions/conflicts in communication and cooperation between institutions, failure to establish healthy relations with NGOs and volunteer organizations and attempts to intimidate volunteers came to the fore.

When the theme of positive aspects of interventions for individuals with special needs after the earthquake was examined, the sub-themes of positive aspects of interventions, positive aspects of collaboration and positive aspects of contributions of volunteers were found. When these sub-themes are examined, it is seen that the environment is inclusive, some materials and supplies can meet special

education needs, and the effort and dedication of volunteers and the cooperation of NGOs came to the fore. When the last theme, recommendations after an earthquake, is considered, it is determined that NGOs should work more and increase their visibility, politicians, NGOs, and researchers should work in cooperation, a digital data system should be created, disaster training should be organized, and drills and simulation studies should be conducted.

Individuals with special needs are more vulnerable than individuals with typical development in many aspects during the disaster process. Individuals with special needs are more at risk during the evacuation process from their homes in disasters. After the disaster, they need more psychological, physical, and educational support (Stough et al., 2017). Individuals with special needs may face obstacles during emergency response and rescue efforts. During disasters, the process becomes difficult for children with special needs who need electricity as medical support and children in wheelchairs. Disasters also affect parents and parents often have difficulty in responding appropriately to their children's needs (Alexander, 2015). Children with special needs may experience a decrease in their academic achievement or behavioural problems with the disaster process, and situations such as the loss of teachers and personnel working with children with special needs, damage to accessible schools, and loss of records related to special education affect children with special needs and their families. In short, children with special needs are often disproportionately exposed to the effects of disasters (Stough et al., 2020).

Looking at the literature, there are studies on individuals with special needs and the disaster process (Boon et al., 2011; Ronoh et al., 2015; Türk, 2022; Tonak & Kitiş, 2022; Pakalın & Mersin, 2023). In addition to these studies, there are studies on the disaster preparation skills of individuals with special needs (Garcia et al., 2016; Musaoğlu, 2022). A limited number of studies conducted with experts or teachers working with children with special needs (Kato et al., 2014; Kawasaki, 2022) were found. There is no study conducted with teachers who were assigned to the earthquake region after the disaster as in Türkiye, and there is also no study in which focus group interviews were conducted with teachers after the earthquake.

Considering the views of the participants in the study and the studies in the literature, it is seen that planning the process before, during and after the disaster is of great importance. Knowing what can create danger in the pre-disaster process and making preparatory studies to minimize possible dangers can reduce the possibility of individuals with special needs being negatively affected by the disaster process. Individuals with special needs and their families should be included in the planning process related to the disaster process within the framework of a rights-based approach and it is important to develop disaster management strategies sensitive to special needs (Türk, 2022). After the disaster, individuals with special needs should be evacuated to safe places and their basic needs should be met. Gathering areas should be accessible. After the disaster, basic needs should be met in cooperation with public and NGOs (Bilik & Akdağ, 2023). In addition, the suggestion of the participants in the study to create a digital database is also supported by other studies in the literature. For example, in a study conducted by Proffitt Lavin et al., (2012), it is mentioned that it may be easy to establish a national network and database for case management in disasters and to determine the needs of individuals with special needs with this network.

When other studies in the literature are examined, it is stated that individuals with special needs in the post-disaster process need resources and support in shelter, health, education, and transportation services as well as finding a job and being employed after a certain period. In addition to this, it is also seen that individuals with special needs face problems such as intensive paperwork or prolonged support processes in the process of accessing services in the post-disaster process (Stough et al., 2016). It is seen how important it is to plan the pre-disaster process against such situations that may occur

after the disaster. In addition, the importance of disaster training, drills, and simulation studies, which are included in the recommendations section of the study, is also emphasized in other studies in the literature. Baker et al., (2012) emphasize that families should include a three-stage preparation process in the pre-disaster process. This preparation process consists of stages such as having information about potential hazards in their environment, making communication and evacuation plans, and creating a self-sufficient material set within three days after the disaster. In addition, it is emphasized that the media should also work on disaster preparedness at home.

Considering the research conducted, the limitation in recognizing and expressing the needs of parents, which is a sub-theme of the theme of difficulties after the earthquake, is a very important finding. Establishing public social support programs will ensure that parents are aware of their needs, rights, and social supports. In addition to this, social policies are also needed to eliminate disadvantages for individuals with special needs (Yılmaz, 2022). As a result, a holistic and multidimensional approach to disaster management determines the post-disaster process. It is vital to create a disaster management model that includes all individuals and to take the opinions of individuals with special needs, families, experts, and NGOs working with individuals with special needs, to cooperate with them and to inform them about the process while creating this disaster management model.

6. Limitations

The research was conducted as an online focus group interview due to the conditions of the teachers. This situation may be one of the limitations of the research. It is important to conduct more than one focus group interview in order to diversify the data obtained. In terms of the recommendations of the research, future researches can be designed in a different research model. In addition, more teachers can be included in the research. Interviews can be conducted in face-to-face.

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Research Article

Acquisition of –Ing in English by Multilingual Adult Speakers in Germany and the US

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Abstract: The number of the multilingual speakers all over the world has been increasing steadily, which calls for closer analyses of multilingualism as a phenomenon. The current study aims at investigating multilingual speakers' spoken and written English productions in formal and informal contexts within the boundaries of social context of migration. As for the purposes of the study, data coming from four groups in Germany and the US (32 participants and 24 speakers from RUEG corpus, 56 people in total) via data collection tools such as Language Situations (Wiese 2018), Linguistic Background Questionnaire and c-tests were analyzed both qualitatively and quantitatively. The results were divergent. The comparison of -ing use only revealed that the acquisition of the progressive marker in L3? English differs in Germany and the US while -ing use in total Communication Units (henceforth CU) ratio signaled some cross-linguistic effects. However, there was no difference in within group comparisons obscuring multilingual-monolingual dichotomy within both Germany and the US. Also, task modality and registers were found to have a prominent effect on L3 patterns of English progressive morpheme -ing.

Keywords: Second Language Acquisition, Verbal morphology, English Language Teaching, Multilingualism

1. Introduction

In line with the improvements in technology and mobility among countries, multilingualism has rapidly increased all over the world in recent years (Kachru, 1992). Thus, this has had its reflections on the scientific inquiry which seeks to understand the underlying mechanisms of multilingualism from different perspectives (Cenoz & Genesee 1998; Herdina & Jesner 2000, 2002; Aronin & Hufeisen 2009; Szubko-Sitarek, 2015 among many others). Yet, the studies have been diverted into two major areas as purely structuralist ones highlighting the linguistic differences mostly (i.e. Clyne 1997; Williams & Hammarberg 1998; De Angelis & Selinker 2001; Falk & Bardel 2011; Garcia-Mayo & Rothman 2012; Hall & Ecke 2013) and as studies stressing the sociolinguistic aspects (i.e. Appel & Muysken 1987; Harris & Campell 1995; Clyne 2000; Thomason & Kaufman 2001; Auer 2005). Studies in the former group indicate "variability" in the overt use of linguistic tools, which is highly dependent on factors such as instruments, modality (spoken vs. written), age of acquisition, previously acquired languages, etc. Similarly, studies in the latter group also reveal variability which predominantly resulted from context (formal vs. informal), register, modality, etc. All these studies diverge to a great extent in terms of the first language, linguistic phenomenon under investigation, theoretical background and data collection tools.

Thus, the aim of the current study is to investigate factors such as task modality, formality and cross-linguistic influence of L1 morpho-syntax on both spoken and written English in a multilingual context. More specifically, the study investigates whether the availability of an aspect marker –(I)yor (i.e. progressive) in Turkish has an impact on Turkish heritage speakers' (who were born in Germany and learned English as a foreign language in a formal setting) use of aspectual morpheme (i.e. progressive suffix -ing) in English spoken and written productions at both formal and informal settings.

1.1 Literature Review

There are a number of attempts to understand multilingualism from different perspectives. Nevertheless, when compared to Second Language Acquisition (henceforth SLA) studies, research on

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multilingualism, third language acquisition (i.e. L3A) or Ln acquisition has been in its infancy. Until recently, many researchers tended to involve any study including more than one language under SLA studies. However, a number of researchers caution that SLA and multilingualism are fundamentally different. To illustrate, following Grojean's (1989) analogy of "a bilingual is not the sum of two monolinguals", "a multilingual is not three or more separate monolingual brains in one individual's head" (Slabakova, 2017). Moreover, in the case of multilingualism cross-linguistic influence (henceforth CLI) may come from a variety of sources. These theories have based their accounts on CLI coming only from L1 (Hermas, 2010; Jin 2009; Leung, Slabakova, Montrul & Prevost, 2006), only from L2 (Bardel & Falk, 2007, 2012; Falk & Bardel, 2011), from a cumulative account of previously acquired languages (i.e. CEM: Cumulative Enhancement Model) (Flynn et al., 2004) or either from L1 or L2 based on (psycho)/typological similarities (i.e. TPM: Typological Primacy Model) (Rothman, 2011, 2015). In brief, there is no consensus on what transfers where in multilinguals' brain.

Especially, in countries like Germany and the US with a long migration history, studies on multilingualism have been notably significant. Particularly in Germany, since the classrooms consist of a large number of heritage speakers in addition to monolingual speakers, acquisition of a third language namely English turns out to be an intriguing area for research purposes.

For the sake of clarity, monolingual as a descriptor will be used to refer to English native speaker participants residing in United States and German native speaker participants who were monolingually raised, learned English as L2 in school contexts, and reside in Germany at the time when this study was conducted. Their language background was crosschecked via Linguistic Background Questionnaire and none reported early exposure to any other languages. In a similar vein,, multilinguals were those participants with either heritage language backgrounds (i.e. Turkish speakers residing in Germany) or early exposure to the target language (i.e. German speakers residing in the US).

Under these circumstances, English language could be presumed to be the third language acquisition for heritage speakers and second language acquisition for native speakers residing in Germany. Although the definitions for these terms might be blurry in some contexts it is highly probable that acquirers follow distinct paths in their acquisition process due to a number of variables involved. For instance, morpheme order studies of English suggested that the progressive marker was one of the earliest morphemes emerging in both native and non-native speakers' grammar (Dulay & Burt, 1974; Goldschneider & DeKeyser, 2001). Yet, whether it holds true for multilingual contexts where at least two typologically (dis)similar languages involved calls for further scrutinization. Thus, there are some studies which investigated acquisition of English by multilingual speakers in Germany. These studies target children or adolescents different from the current study targeting adults, and they provide invaluable insight as to type of CLIs and intervening factors.

One of these is Sağın-Şimşek's (2006) study. In her study, 14 Turkish heritage speakers who were students at various secondary schools in Hamburg at the time of the study were employed and their written productions in English were analyzed in terms of CLIs in word order. The results revealed that although there were CLIs from both heritage Turkish and majority German, the latter had a predominant effect multiplied with (psycho)/typological influence. More specifically, German being V2 language was particularly a source language for CLIs related to topicalization in word order. Thus, Sağın-Şimşek (2006) claims that participants were resorting to German by overriding their Turkish-mode based on the typological similarities shared by German and English.

Likewise, Şahingöz (2014) examined L3 English written and spoken productions of Turkish-German, Russian-German bilingual ninth graders and German monolingual speakers. The results signaled German effect in object placement and verb-raising while all groups differed from one another fundamentally.

Another study was conducted by Hopp and Lemmerth (2018) to search for possible transfer effects on receptive and productive skills of Turkish-German bilingual children in English as L3. In the study 31 Turkish-German bilingual and 31 German monolingual children (who were strictly matched in linguistic and cognitive tests such as vocabulary, grammar, working memory, phonological awareness, etc.) were compared and contrasted in their word order, verb raising, and subject and definite article omissions. Data collected via sentence repetition and picture story production tasks revealed no statistically significant difference between monolingual and bilingual participants. The analysis of grammatical transfer indicated that participants in both groups transferred from German irrespective of task type and their L1s. Yet, Hopp and Lemmerth (2018) warn that this might also be related to language dominance since all participants were born and raised in Germany. More explicitly, Turkish heritage speakers might have German as their dominant language, which was also supported by their high scores for productive vocabulary in German than in Turkish (Hopp & Lemmerth, 2018, p. 580). In terms of theories of multilingualism, Hopp and Lemmerth (2018) further argue that the findings support TPM while L2 status factor model was ruled out due to its basis on maturation argument and age of acquisition. In brief, in line with findings of Sağın-Şimşek (2006), Şahingöz (2014), Hopp and Lemmerth's (2018) study demonstrate that German (either because of typological similarities or being the dominant language) is the source language for transfer in acquisition of English as L3.

There is another project called Linguistic Diversity Management in Urban Areas conducted between 2009 and 2013. It consisted of written data in English gathered from both heritage speakers (i.e. Turkish, Russian, Vietnamese) and monolingual English, German, Russian, Turkish, and Vietnamese speakers aged between 12 and 16 years. The study tested whether there was a multilingual advantage resulting from multiplied metalinguistic awareness supported by access to grammar of more than two languages. Specifically, Lorenz (2018) checked whether the multilingual participants outperformed the monolinguals in the accurate use of the progressive aspect in English. 209 picture story telling texts were collected in total. In this task participants were shown six pictures and requested to write at least two sentences for each picture within a total amount of 30 minutes. The results demonstrated that two groups differed in the number of missing auxiliaries signaling a monolingual advantage. Also, monolingual English, Turkish and Russian participants wrote more "typical" progressive constructions sticking to "be Ving" frame. On the other hand, the results revealed a high correlation between "formal correctness" and "school types" (Lorenz & Siemund, 2019). In particular, Vietnamese-German participants attending Gymnasium (one of the top high school types) produced more "target-like" progressive constructions than Turkish-German participants who were students in schools Gesamtschule, Stadtteilschule. All in all, Lorenz (2018) claimed that researchers could not find a multilingual advantage over monolinguals in the use of progressive in English. Besides, participants' proficiency in their heritage languages as well as other intervening factors such as type of school, type and amount of formal instruction in English were not controlled, which might have a crucial significance in multilingual acquisition.

In brief, even though there are studies stressing the acquisition of English at a multilingual setting in Germany from different perspectives, none of them have targeted adult multilinguals' acquisition of the progressive marker in English broader repertoires (i.e. both written and oral productions in formal and informal contexts). Thus, the current study aims to fill this gap by providing data from both written and spoken productions of Turkish heritage speakers residing in Germany and comparing it to data from both heritage and native speakers residing in the US.

2.1. The issue under investigation

The present study will focus on one of the inflectional morpho-syntactic units in English. There are eight English inflectional morpho-syntactic units (i.e. plural -s, third person singular -s, possessive -s, past tense -ed, comparative -er, superlative -st, past participle -en, progressive -ing). Among these, the

progressive aspect suffix -ing was chosen to understand the heritage language's effect on L3 English. Specifically, in German there is no inflectional morpheme that marks the progressive although it is a Germanic language as English. However, in heritage Turkish, aspect is grammaticalized in the form of a suffix (-(I)yor and -(A)mAktA) similar to English. Then, the investigation of the progressive in English will reveal whether the availability of such a suffix in heritage language facilitates L3 acquisition of English progressive. In a similar vein, whether the non-availability of it in non-heritage German has an impact on the same process will be shown. Additionally, possible CLIs will provide support for L3 acquisition theories, revealing which theory (L1 transfer, L2 status factor, CEM, or TPM) has more explanatory power. The research questions are as follows:

(1) Do L3 (or Ln) English multilingual speakers residing in Germany differ from monolingual English speakers residing the US in their correct suppliance of -ing? [L1 vs. L2 & L3]
(2) Do L3 (or Ln) English multilingual speakers with the same level of English proficiency differ from monolingual German speakers residing in Germany in both written and oral production of -ing in English? [L2 vs. L3]
    a) If yes, are there any CLIs or transfer effects stemming from previously acquired languages (i.e. Turkish)?
(3) Are there any context/register differences in correct suppliance of -ing as formal tested via imaginary police call and official report vs informal in the form of Whatsapp texts among groups?

2.2. Linguistic background

In the grammar of languages, verbs are inflected for tense, aspect and modality. Tense marks the time of the event while aspect refers to viewpoint (Comrie 1976; Smith 1999). Specifically, if the event is viewed as a whole (with specific references to the starting and endpoints) it is called a perfective. If not, then it is referred to as imperfective. Within imperfective aspect, events may be either viewed as "specific incomplete" (i.e. progressive) or "incomplete repetitive" (i.e. habitual). In this study, the progressive aspect that is grammaticalized in various ways will be discussed for the languages under investigation. In addition to the grammatical aspect, there is also lexical aspect in languages, which is also called "Aktionsart, actionality, aspectual class or situation aspect" (Filip, 2012) and it refers to the inherent viewpoint of verbs' semantic content. As for the purposes of the current study grammatical aspect, that is the overt use of -ing in English, will be investigated.

In English, the progressive is marked with an auxiliary and -ing suffix on the verb. Besides, the use of progressive aspect with statives and achievements yield ungrammatical sentences in English (de Swart, 2012). However, it has been noted that there might be cases where the progressive suffix is also used with stative verbs like "love" as it is the case in McDonald's slogan "I'm loving it") (de Swart, 2012; p. 5).

Being another Germanic language, German differs from English in the progressive aspect. That's, there is no overt morpheme to mark progressive aspect. Instead, as Blevins puts it "while there is no standard morphological marking for the progressive aspect in Standard German, there are several colloquial and dialectical constructions that can be used to express progressivity, or something similar to it." (2018, p. 76). König and Gast (2012) state that a German equivalent for the following sentence "Charles is working." will be "Karl arbetitet gerade."; "Karl ist am Arbeiten."; "Karl ist beim Arbeiten."; "Karl ist arbeiten." (p. 93).

On the other hand, one of the agglutinative languages, Turkish is highly rich in inflectional morphology. Thus, Turkish marks aspect as perfective and imperfective (Taylan 2001). Within imperfective category there are both progressive and habitual aspects all of which are overtly realized in the form of suffixes (Göksel & Kerslake, 2005). As for progressive aspect, there are two suffixes (i.e. -(I)yor and -mAktA) which can be used to refer to progression interchangeably with a slight difference in formality. The

former is way more common than the latter and both can be used to extend the meaning of a sentence to habitual aspect in combination with time adverbials. Hence, it is possible to use suffixes for aorist and progression interchangeably as can been seen in 2a and 2b. Besides, different from English, the progressive suffix in Turkish can be used with statives and achievements.

(1) a. I know this book very well.
b. *I am knowing this book very well.

(2) a. Ben bu kitab-ı çok iyi bil-iyor-um.
I this book-ACC very much know-PROG-1SG
'I know this book very well.'
b. Ben bu kitab-ı çok iyi bil-ir-im.
I this book-ACC very much know-AOR-1SG
'I know this book very well.'

To sum up, although none of the languages under investigation have exactly the same progressive aspect morpheme as English, Turkish seems to have more features in common than German. In brief, both English and Turkish mark progression with an explicit and regular suffix attached to the verb, which might alter how acquirers attain it.

3. Method

3.1. Participants

Data for this study come from two groups of speakers. The first group consists of 32 participants who are Turkish heritage speakers and German monolingual speakers residing in Berlin, Germany. 16Turkish heritage and 16 German native speakers were recruited to compare L1 vs. L2 effects on L3 English acquisition. They were found via convenient and snowball sampling. The criteria for the participants were as follows: They were adult heritage speakers of Turkish or German native speakers aged between 25 to 35, either born in Germany or migrated to Germany before the age of 2, earned at least a high school degree in Germany (i.e. to make sure that they get similar type of English language exposure). They were paid 15 Euros for their participation.

The second group of speakers were 14 randomly chosen L1 English and 10 heritage German speakers' data in RUEG corpus which was compiled in the USA as exactly the same way via the same data collection tools (Wiese et al. 2019). The same inclusion criteria with the first group (i.e. aged between 25 and 35, born in the US or migrated to the US before the age of 2, and at least a high school degree) were applied. Data were downloaded from ANNIS corpus version 3.7.1 (http://corpus-tools.org/annis/.) The aim was to compare and contrast monolinguals to multilinguals in two settings. In short, data coming from four distinct groups of speakers were utilized. The following labels will be used to refer to each group.

(1) EngM: English monolinguals residing in the US
(2) H-Ger: Heritage German speakers in the US
(3) GerM: German monolinguals residing in Germany
(4) H-Tur: Heritage Turkish speakers in Germany

3.2. Instruments

There were three data collection tools in this study. The first one is called "Language Situations" which help to elicit a wide range of data across speakers and registers within a controlled setting (Wiese, 2018). More explicitly, participants are shown a silent video of a car accident and requested to imagine themselves as a passer-by. Then, they are asked to recount what happened to both their close friend (i.e. as an informal setting) and to a police officer (i.e. as a formal setting). Also, both written and spoken descriptions of the same event are collected. In brief, although no statistical analysis of the instrument

(i.e. reliability) is available, its design has been based on longitudinal comparisons of both naturalistic and elicited data (Wiese, 2018). Hence, it has been claimed to enable researchers to collect data in an efficient way for a variety of research foci since it triggers natural language productions in a controlled setting (Wiese, 2018).

The second data collection tool is Linguistic Background Questionnaire in which participants' language habits are investigated via both online and pen-and-paper tests. With the online questionnaire the aim is to identify language(s) and contexts where these languages are used. Including English monolinguals all participants responded to it. Some of the participants (13 of them) have already taken it since they have already participated in the German and Turkish phases of the study. 19 new participants were asked to fill this online questionnaire at the end of the elicitation period. In addition to this online questionnaire, all participants were also asked to fill out a pen-and-paper questionnaire in English, which targets their English learning history with questions such as when and where they started to learn English or if they have ever been to English-speaking countries.

The third and last data collection tool is a C-test that was used to make sure that any difference among groups is due to some other variables but not their English proficiency. Also, Grotjahn, Klein Braley, and Raatz (2002) claim that c-tests are one of the most effective instruments to test foreign language proficiency as they assess distinct linguistic competencies in a contextualized manner. Thus, two texts with 20 gaps in total were chosen to measure English proficiency of all participants and administered at the very end. A one-way ANOVA was conducted to compare means of all groups. Results revealed significant differences between EngM and others $F(3, 56) = 15.25$, $p < 0.05$ although H-Ger (H-Tur, p=0.623; GerM, p=0.347), H-Tur (H-Ger, p=0,632; GerM, p=0.076), and GerM (H-Ger, p=0623; H-Tur, p=0.076) groups did not differ from one another in terms of their English proficiency.

3.3. Data collection

In line with RUEG project and requirements of Language Situations, data collection was carried out by two researchers (one playing the bad cop to elicit formal data and handle with paper work for the purposes of creating a more formal setting and the other playing the good cop to elicit informal data and carry out the informal ice-breaker chit-chat session). Thus, one of the researchers was the bad cop and a student assistant from a project was the good one. Two rooms at the university were determined and prepared as formal and informal settings. Also, the technical devices such as a voice recorder, a laptop (15inch laptop borrowed from Humboldt University) and a smart phone were set and all necessary software was downloaded. Consent forms (i.e. ethical approval by the Deutsche Gesellschaft für Sprachwissenschaft (– no: #2017-06-171120) as well as all other paper work were prepared and copied. The researchers at different meetings rehearsed the study. Then, a call for participants was sent and elicitation sessions were set up in accordance with participants' and researchers' schedules. The order of elicitation was randomized with all eight possible cases (see Table 1). Each participant started the study with the consent form and ended with the c-test. Prior to the elicitations, the video was shown and they were asked if they had any questions. The voice recorder was on throughout the whole session. Informal written (henceforth IW) data were collected via Whatsapp text messages while for formal written (henceforth FW) data participants were instructed to write the text directly on the blank page on the laptop. All spoken data (both formal and informal as indicated FS and IS) were collected via the voice recorder. Each session took 45 minutes to one hour depending on the participants' pace.

Table 1

Order of Elicitation.

Order1	Order2	Order3	Order4	Order5	Order6	Order7	Order8
IS	IW	IS	IW	FS	FW	FS	FW
IW	IS	IW	IS	FW	FS	FW	FS
FS	FS	FW	FW	IS	IS	IW	IW
FW	FW	FS	FS	IW	IW	IS	IS

3.4. Data analysis

Both qualitative and quantitative analyses were conducted. Initially, to identify -ing progressive use two sets as exclusion and inclusion criteria were determined. In specific, exclusion criteria suggest that -ing constructions in all gerund uses, reduced relative clauses and in adjectives (i.e. The accident was shocking/annoying) were excluded. Similarly, S-V agreement violation was ignored since it is beyond the scope of the study. On the other hand, all "be Ving" constructions were accepted based on the inclusion criterion. Then, all communication units (henceforth CUs) were examined in line with the following classification:

- Accurate Use (i.e. He was walking.)
- Variation 1 (V1): missing -ing (i.e. *I am see it.)
- Variation 2 (V2): missing aux. (i.e. *A guy playing with it.) (making sure that it is not a gerund use or reduction in relative clause)
- Variation 3 (V3): there constructions (i.e. There was coming a woman.)
- Variation 4 (V4): verb type: non-activity verbs (i.e. He was stopping.)

There was only one researcher who coded the data to group the variations. In cases of uncertainty, the researcher discussed variations with the project coordinator but no formal assessment was carried out to check the interrater reliability. Then, in line with the purposes of the study, since variables are categorical Chi-Square tests were run in SPSS 23.0 to figure out distinctions among and within four groups.

4. Results

As there were two diverse groups in two countries, each setting was examined separately at the initial stage. Thus, first of all groups in Germany were examined to reveal the effects on multilingualism on -ing uses in L3 English setting. All groups were found to be highly accurate in their both oral and written productions while slight differences were observed in terms of the types of variations based on the above inclusion criteria. Table 2 and Table 3 below demonstrate the distribution.

Table 2

Heritage Turkish (H-Tur) Speakers' Progressive Use (N=14)

	Accurate	V1	V2	V3	V4
FS	46	1	1	-	-
FW	28	-	-	1	1
IS	24	-	-	1	1
IW	21	-	-	-	-
TOT	119	1	1	2	2
%	95.2	0.8	0.8	1.6	1.6

Table 3

German Monolingual (Germ) Speakers' Progressive Use (N=14)

	Accurate	V1	V2	V3	V4
FS	60	1	1	2	1
FW	48	-	-	1	1
IS	62	-	-	2	2
IW	27	-	-	2	1
TOT	197	1	1	7	5
%	92.9	0.5	0.5	3.6	2.5

As it is obvious from Table 2 and Table 3, all participants were highly accurate in their -ing suppliance irrespective of their being mono or multilingual. In specific, availability of progressive morpheme in Turkish heritage language seems to have no facilitative effect. More explicitly, German monolingual speakers produced more -ing although there is no such morpheme in German. Yet, "There constructions" (V3) seemed to pose a problem for GerM speakers more than heritage speaker groups, which might stem from V2 property of German language (i.e. which suggests that the finite verb must occur in the second position of the sentence).

All groups in Germany were compared and contrasted statistically as well. The comparison of GerM and H-Tur revealed no statistical difference (X^2 (1, N = 32) = 17.83, p = .429). Then, in an English as a Foreign Language context previously acquired languages (be it either L1 or L2) seem to have no statistically significant effect on the acquisition of English progressive morpheme. This again suggests no facilitative effect of L1 Turkish.

The second setting in the US was required to discern multilingual vs. monolingual dichotomy. Furthermore, English data from H-Ger speakers were also involved to further discuss the same issue. Table 4 indicates the results across four tasks.

Table 4

Heritage German (H-Ger) Speakers' Progressive Use (N=10)

	Accurate	V1	V2	V3	V4
FS	28	-	1	-	-
FW	27	-	-	-	-
IS	27	-	-	-	-
IW	11	-	-	-	1
TOT	93	-	1	-	1
%	97.9	-	1.05	-	1.05

Table 5

English Monolingual (Engm) Speakers' Progressive Use (N=14)

	Accurate	V1	V2	V3	V4
FS	36	-	-	-	1
FW	30	-	1	-	-
IS	26	-	-	-	-
IW	16	-	-	-	-
TOT	108	-	1	-	1
%	98.2	-	0.9	-	0.9

Following the same reasoning, all groups in the US were scrutinized. EngM and H-Ger speakers were found to be similar in their progressive use (X^2 (1, N = 24) = 15.61, p = .85) obscuring the effects of an additional language.

As Table 2, Table3, Table 4, and Table 5 indicate, four groups differed in their progressive aspect marker -ing uses to a great extent. The results indicated that the difference between language background and progressive morpheme use was statistically significant X^2 (3, N = 56) = 11.78, p = .019. More specifically, further comparison of H-Ger and GerM groups showed that they differed in their progressive use significantly (X^2 (1, N = 26) = 14.92, p = .029). GerM used English progressive morpheme more often than H-Ger. This might be interpreted as some other factors such as English language proficiency, place of acquisition, type of exposure (natural vs. instructional), amount and type of input having a prominent role in multilingual acquisition.

Further analyses were run to see whether -ing use in overall CU ratio differs. More explicitly, all groups did not produce the same number of CUs. Isolation of -ing might obscure some groups producing significantly few CUs. Thus, for each group CUs were also found and the ratio of -ing marked verbs to overall CUs was calculated as shown in Table 6.

Table 6

Ratio of -Ing Marked Verbs

	TOT CUs	TOT -ing	Ratio (%)
EngM	492	108	21.9
H-Ger	374	93	24.8
H-Tur	404	119	29.5
GerM	770	197	25.5
TOT CUs	2265	593	26.1

Although the statistical comparisons of CU/-ing ratios revealed no significant effect; X^2 (3, 56) = 26.4 (p = .22), it is evident that H-Tur had higher -ing/CU ratio than other groups. This might stem from the similarity between their heritage languages (namely Turkish) and English in terms of the progressive use. That is, participants in this group might find it far easier to employ -ing in English than other groups. Furthermore, the difference between H-Ger and GerM that was found in the comparison of total -ing uses faded away. Lastly, the number of ing- productions by H-Tur exceeded the ones produced by EngM, which calls for closer investigation. Within the framework of this study, the only difference between two groups is their proficiency. Thus, it could be speculated that higher proficiency might equip native speakers with a variety of linguistic tools that could have masked the necessity to use progressive marked verbs.

In brief, the results revealed that all groups irrespective of their linguistic background were highly accurate in their -ing uses. However, there are some differences among groups based on the distinctions in data analyses. To begin with, the results of the first analysis revealed that groups residing in Germany and the US differ with respect to quantity of their -ing. There might be some possible reasons for this finding. Firstly, English language proficiency and input might be significant variants in these contexts. No statistical differences were found in English proficiency tests between groups GerM and H-Ger. Yet, this might be closely related to the construct validity of the c-tests. These are supposedly the most prominent differences between H-Ger and GerM speakers. Yet, the inverse proportion of -ing uses of H-Ger and EngM speakers might stem from the likelihood of employing some other linguistic tools available to them (i.e. time adverbials and other tense aspect and modality markers) instead of the progressive morpheme. Similarly, their being more proficient may equip them with such linguistic tools. Secondly, the way English language is acquired might result in such a difference. More specifically, all participants in Germany learn English in an EFL context at schools while in the US participants are also immersed in English language and culture. This would typically have an effect on the type and amount of input.

On the other hand, the second data analyses indicated that groups' -ing/CUs ratios differ signaling heritage language effect. More specifically, H-Tur preferred to use more -ing marked verbs within their all CUs. This might stem from language specific properties of Turkish. As such, availability of a similar unit that carries morphosyntactic information may cause acquirers to exploit their heritage language resources in acquiring another language. This might also be accepted as a further support for TPM (Rothman, 2011, 2015) since typological similarities seem to have a facilitative effect in the frequent use of English progressive in this highly multilingual context.

In terms of variations, divergent -ing marked CUs are highly limited when compared to accurate uses in general, which might be a further support for the first claim related to English language proficiency.

However, there is a slight difference between the type of variations between participants residing in Germany and the US. There are more V3 and V4 type variations in EFL context whereas this was not the case for H-Ger and EngM speakers. Then, similar to results of many other studies (Stutter-Garcia 2019), it might be claimed that less proficient multilingual learners are more prone to cross-linguistic effects of previously acquired languages. Yet, this argument calls for further investigation which would examine these linguistic phenomena in isolation.

Task-wise analyses of data indicated that all groups produced more English progressive in spoken than in written tasks based on frequencies. Likewise, they used -ing least in IW task. As for the comparison of different registers, four groups employed -ing more in formal ones instead of informal ones. Specifically, in Germany, H-Tur and GerM speakers tended to use -ing more in formal contexts. The following table indicates the use of -ing across four registers for each group from mostly employed to the least employed ones.

Table 7

Registers and Tasks Across Groups

Group	Frequency order
H-Tur	FS > FW > IS > IW
GerM	IS > FS > FW > IW
H-Ger	FS > FW = IS > IW
EngM	FS > FW > IS > IW

–ing marked units were calculated as in Table 6 and the frequency order across various registers and modalities was formulated. As it is indicated in the Table 7, task modality appears to be related to the use of progressive marker in English. Particularly, oral data tended to involve more -ing while this was not the case for written one. In terms of the registers, even though the tendencies do not reveal clear-cut results, it is possible to claim that formal contexts dominate its use more than informal ones.

5. Discussion

The current study tested the acquisition of -ing in a multilingual context in Germany. The first research question taps whether there is a difference in English progressive morpheme suppliance between EngM and multilingual speakers residing in Germany. The results indicated that multilingual speakers in Germany produced significantly more -ing marked CUs than EngM and H-Ger residing in the US. Yet, divergent forms for both groups were very restricted. Besides, heritage languages in Germany (i.e. Turkish) had facilitative cross-linguistic effect on English.

The second research question of the current study investigated the use of -ing by heritage and monolingual speakers in Germany. Results revealed no significant difference among groups in terms of accurate uses in isolation while comparison of -ing/total CU ratios signal some distinctions. More specifically, H-Tur group was found to employ -ing marked verbs more than any other groups. As discussed earlier, this might have its roots in linguistic similarity of progressive aspect in these languages, which would provide further support for Rothman's (2011, 2015) TPM.

Even though multilingual speakers in Germany signaled some difficulty with "there constructions" and "stative verbs", there were only few cases. Still, this might signal L2 (German) effect instead of L1 which is structurally more similar to English in terms of progressive aspect for heritage speakers, which was also echoed in many other studies as Sağın-Şimşek (2006), Şahingöz (2014), Hopp and Lemmerth

(2018). However, these singled out cases of CLIs do not provide any support for any specific L3 acquisition theories.

Additionally, the data seem to unveil task and formality effects on the use of progressive morpheme in English. For instance, -ing was used more frequently in spoken data than written one. Also, all groups employed more -ing in formal contexts than informal ones, which might stem from speakers' urge to be more precise in their aspect choices. Thus, the study revealed that formality and task modality are two prominent factors in L3 acquisition in addition to many other factors.

6. Conclusion

Overall, the study indicated that the English progressive morpheme is used differently in Germany and US in terms of both variations and total CU/-ing ratios. Moreover, within the same contexts such as Germany this difference is evident among H-Ger, H-Tur, and GerM in their use of –ing. Thus, although the comparisons did not reveal statistically significant differences regarding the accurate suppliance of –ing the results demonstrated that heritage languages in multilingual contexts might influence the acquisition of English as a foreign language. Furthermore, English proficiency and exposure, task type/modality (as spoken and written), and formality seem to play substantial role in the use of progressive aspect in English. Besides, linguistic feature to be acquired might have strong influence on L3 acquisition as well. More specifically, compared to other seven inflectional suffixes in English, -ing might be less troublesome to acquire with highly restricted and straightforward contexts to appear.

In brief, the study unveiled error-free acquisition of English progressive marker with some probable L1, context, proficiency, task, and formality bound effects on it. Yet, the current study is not without its limitations. It might be better to investigate CLIs such as V3 and V4 in isolation in future studies as there are varied approaches to account for the structural information provided by them.

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Research Article

The Relationship Between Pre-Service Teachers' Motivation to Teach and Curriculum Literacy

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Abstract: This study aims to determine the relationships between teaching motivation and curriculum literacies. A total of 154 pre-service teachers studying in their final year at a state university participated in the study. Data were collected with the Motivation to Teach and Curriculum Literacies scales. This study was conducted in a relational survey model. Correlation and regression coefficients were calculated to analyze the study questions. Analyses were performed using SPSS 25.0. Findings revealed that there were moderate relationships between pre-service teachers' intrinsic motivation and assessment, subject matter knowledge, psychological foundation, and extrinsic motivation. It was determined that there was a high correlation between content knowledge and assessment basis. Extrinsic motivation was moderately related to psychological foundation and weakly related to other foundations of curriculum literacy. The relationship between the assessment and subject matter knowledge dimensions of curriculum literacy was found to be high. Motivation to teach explains curriculum literacy at a weak level. Intrinsic motivation was found to be one of the variables affecting subject matter knowledge and assessment literacy. Overall, the results suggest that the scope of curriculum literacy and other factors that may be associated with it need to be redefined.

Keywords: Curriculum Literacy, Motivation to Teach, Teacher Education, Pre-Service Teachers

1. Introduction

In a developing and transforming world, the importance attached to education is rapidly increasing. The education system consists of many components such as teachers, students, and schools. The teacher is one of the most important elements. As important as the development of the student is the development process of the teacher who is responsible for his/her upbringing. In the last quarter of the century, there has been significant literature on the meaning of being a teacher, motivation, self-efficacy, decision-making, career choice, and self, etc. that affect the professional tendencies of pre-service teachers and teachers (Bedel, 2016; Bilim, 2014; Barni et al., 2019; Calkins et al., 2023; Han & Yin, 2016; Lauermann et al., 2017; Neves de Jesus & Lens, 2005; Wagner & Imanel Noy, 2014; Watt & Richardson, 2015; Wolf et al., 2021). One of the issues that researchers have focused on is motivation to teach. The most fundamental reason for focusing on pre-service teachers and/or teachers' motivation to teach is that motivation is the greatest force that drives people to initiate and sustain any action (Han & Yin, 2016). A human being is a living being with a purpose. The teaching profession is a specialized field that requires teacher qualities such as dedication to the profession for the sake of students without expectation of profit, a love of teaching, an emphasis on social development, and a role of guidance based on wisdom. These qualities are based on the desire of human beings to reveal their raison d'être and to succeed by realizing their existing potential. It is known that the initial motivation of candidate teachers are effective in their success (Sivrikaya, 2019) and in their choice of teaching as a professional profession (Štemberger, 2020). Intrinsic motivation, which is related to the interest of individuals as a reason for choosing and starting to be a teacher, extrinsic motivation, which is shaped by the influence of external conditions, and altruism, which refers to trying to be useful to humanity without expecting any reward (Rutten & Badiali, 2020).

Studies on the motivation are based on theories of motivation. According to Han and Yin (2016), in studies investigating the motivation levels of candidate teachers and teachers on the axis of social cognitive-based motivation theories such as goal setting, expectancy-value, etc., no consensus has been

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reached on the validity of these theories since there are many theories. However, individuals may choose to become a teacher with certain expectations. Underlying these expectations are a number of intrinsic, extrinsic, or altruistic factors such as *love of teaching, belief in the prestige of the profession, and job security* (Htang, 2019). It can be therefore expected that candidate teachers will show intense interest in teaching content knowledge courses with the effect of their initial motivation and that their self-efficacy and curriculum literacy will also be high. This is because motivation is a variable related to self-efficacy belief (Saracaloğlu & Dinçer, 2009). Given that motivation levels are related to self-efficacy levels, this result suggests that motivation and curriculum literacy, which refers to becoming competent and skilled, may be related variables.

In the literature, there is limited evidence that draws attention to the relationship between motivation and curriculum literacy. However, the evidence of a study by Dağ (2020) showed that curriculum literacy competencies had a low impact on teachers' motivation to teach. Although a similar situation may be valid for pre-service teachers, it can be thought that the curriculum literacy competencies of candidate teachers may be more related to the intrinsic dimension of their motivation to teach. Rutten and Badiali (2020) emphasize the need to pay attention to the initial teaching motivation of candidate teachers and point out that intrinsic motivation is the main force that drives pre-service teachers to teach. Siera and Siera (2011) found that pre-service teachers' motivation to teach/reasons for continuing teaching was explained by the factors of *altruism, personal satisfaction, and utilitarianism*. In a comprehensive study by Han and Yin (2016), it was found that the main importance of teacher motivation is understood from the research evidence on its impact on student motivation. It is also thought that teachers' motivation to teach can affect the way they communicate with students, which is of great importance in education (Vermoto et al., 2020). Therefore, it is quite logical to focus on the connection between teacher-learning motivation levels and curriculum literacy of candidate teachers who have reached the last stage of their education process.

The teacher is the person responsible for the education and training of students in accordance with predetermined official programs. The theoretical and practical knowledge of teachers about these programs is based on the teacher training process. The curricula of teacher training faculties also include general and specific field knowledge courses in educational sciences. With these courses, pre-service teachers learn the definition, the foundations, the subjects, and the structure of the curriculum from a theoretical point of view. Then they make applications in accordance with the teaching program with special field teaching courses. Pre-service teachers are therefore expected to reach a level of literacy for curricula based on curriculum foundations during the teacher training process. Curriculum literacy is accepted as a basic skill that pre-service teachers/teachers should acquire; candidates are expected to be curriculum literate with the education received in faculties of education (Bolat, 2017; Erdem & Eymür, 2018); teachers' ability to comprehend curricula in terms of structure-items and their relationships and to plan teaching is considered important in the implementation of curricula (Akınoğlu & Doğan, 2012). Nevertheless, two different views have been put forward on curriculum literacy: curriculum literacy and curriculum literacy. The first of these is the fact that curricula, like educational programs, are based on philosophical, social, economic, and psychological foundations (Yıldırım, 2020). Pre-service teachers are hoped to be known of the foundations of the curriculum, to be able to select content knowledge, and to be able to organize teaching-assessment processes. In this approach, it can be stated that curriculum literacy is considered as a more comprehensive term and a curriculum literacy understanding is adopted in line with the foundations and elements that make up educational programs.

Demirel (2015) identified four structural elements for an educational program as "Goal, Content, Instructional Procedures, and Assessment." These elements of the education program interact with each other (Gelen, 2020). Akpınar (2015), in the context of in-course elements, handled the curriculum and syllabi, which he classified as its sub-elements, within the scope of in-course elements. In the second approach, Erdem and Eymir (2018, 125) explained in detail that the view that curriculum literacy can

be evaluated according to the questions and structural elements based on curriculum development in the literature and stated that the general acceptance is in favor of the second view. The aim of this study, however, is to investigate the issue based on one of the approaches in the literature rather than what and how the structure of literacy for education or curriculum is. The studies conducted with measurement tools shaped according to the second approach show that curriculum literacy has a weak effect on teaching motivation (Dağ, 2020). It can be expected that the effect of curriculum literacy on motivation to teach will be higher in a study based on the first approach, and this study can also be a source of prediction about the elements of the curriculum. Within this scope, this study focalizes on the relation between curriculum literacy, which is based on an understanding that also covers the foundations of curriculum, and motivation to teach.

It can be said that research on curriculum literacy focuses on pre-service teachers (Bolat, 2017; Erdem & Eymir, 2018; Atlı et al., 2021; Şahin & Tekkol, 2023); teachers (Aslan & Gürlen, 2019; Dağ, 2021; Demir & Toraman, 2021; Kahramanoğlu, 2019; Kasapoğlu, 2020; Keskin & Korkmaz, 2021; Sami, 2023; Saracaloğlu & Çetin, 2023; Sarıca, 2021; Şınego & Çakmak, 2021; Ustabulut, 2021; Yıldırım, 2020) and school administrators (Aygün & Taşdan, 2023). Five of them are scale development studies on curriculum literacy targeting teachers or pre-service teachers (Akyıldız, 2020; Kahramanoğlu, 2019; Kasapoğlu, 2020; Keskin & Korkmaz, 2021; Yıldırım, 2020). Relational research has focused on teachers' curriculum literacy, curriculum orientations and curriculum commitment (Yılmaz & Kahramanoğlu, 2021); administrators' views on teachers' curriculum literacy (Erdamar & Akpınar, 2021); pre-service teacher curriculum literacies and teaching competencies (Gülpek, 2020); teachers' curriculum literacies, individual innovativeness and epistemological beliefs (Kahraman, 2020); curriculum literacy and curriculum leadership (Bolat & Baş, 2023); curriculum literacy and critical thinking (Barut & Gündoğdu, 2023); curriculum literacy and metaphorical perception towards curriculum (Güngör, 2023); the relationship between curriculum literacy and teacher self-efficacy beliefs (Yalçın, Bahar & Yalçın, 2023) issues.

Erdem and Eymir (2018) emphasized that teachers should have knowledge and skills about the elements of the curriculum and that the concept of curriculum literacy is a concept that should be emphasized in teacher education. Pre-service teachers can also be expected to reach the level of knowledge and competence in curriculum literacy. Pre-service teachers are also on a teaching internship. Hence, they demonstrate the knowledge they have acquired in the teacher training program through practices in the teaching internship. Designing teaching plans in accordance with the curriculum, organizing the teaching process, preparing materials, and preparing and implementing assessment activities can be expected to increase their motivation to teach by applying the theoretical knowledge they have previously acquired and putting it into practice during the internship. The increase in this motivation may lead pre-service teachers to strive to recognize-know-apply the curriculum elements; in other words, it may lead to the positive development of their perceptions of curriculum literacy competence. In the literature, a study on curriculum literacy and motivation to teach variables that stand out in teacher education was found (Dağ, 2021). This study examined the relationship between teachers' motivation to teach and curriculum literacy and found that this relationship was positive but weak. It was seen that intrinsic motivation explained the writing dimension of curriculum literacy by 1.5%. Curriculum literacy is one of the concepts that should be carefully considered in the context of teacher training. The literature, some of which is given above, draws attention to the relationship between curriculum literacy and a number of cognitive and affective factors such as motivation, self-efficacy beliefs, teaching competencies, and commitment to the curriculum, which constitute the focus of teacher training programs. On the other hand, curriculum literacy's relationship with a variable such as motivation, which has both affective and cognitive aspects, has not been questioned sufficiently.

To some extent, motivation to teach is a factor that can be reflected in teachers' teaching practices. For example, in a study conducted by Paulick et al. (2013), it was determined that high intrinsic motivation mediated the effect of achievement goal orientations of pre-service teachers on their motivation to continue teaching profession on their teaching practice. Qualitatively different motivations for choosing teacher education as a career, however, are hypothesized to influence teachers' teaching practices and their motivation to teach. Thus, it can be thought that motivation to teach may also be related to curriculum literacy. The results of a study by Coombs et al. (2020) show that pre-service teachers' personal characteristics such as motivation, learning experiences, and context shape their assessment literacy (i.e., understanding of teaching, learning-assessment principles, and teaching practices). Considering the results of the studies given above together, it can be expected that pre-service teachers' motivation to teach affects curriculum literacy as well as assessment literacy. Since motivation to teach is known to be a factor that affects teachers' continuation in the profession and future teaching practices, it is necessary to investigate the curriculum literacy competencies of senior candidate teachers that may be related to this motivation. Teaching vocational education can thus be contributed to.

Pre-service teachers take a large number of curriculum literacy courses during their student years. It can also be thought that the high motivation of candidates to teach can increase and affect their competencies in curriculum literacy sub-dimensions. Dağ (2021) found some evidence that the effect of curriculum literacy on teachers' motivation is weak. It is also possible that the data collected with curriculum literacy measurement tools in which curriculum components are diversified will provide deeper information about the motivation of pre-service teachers to teach. The determination of the relationship between the curriculum literacy of pre-service teachers and intrinsic or extrinsic aspects of teaching motivation can be considered important in terms of the teacher training process. The present study aims to state te relation between candidate teachers' curriculum literacy and their motivation to teach. To this end, the following questions were aimed to be answered in the study:

- What are the average levels of program literacy and motivation to teach scores, including sub-dimensions and total scores, for pre-service teachers?
- Is there a relation between candidate teachers' program literacy and motivation to teach scores, both in terms of sub-dimensions and total scores?
- Does motivation to teach predict candidate teachers' curriculum literacy?
- Do intrinsic and extrinsic motivation sub-dimensions of motivation predict the sub-dimensions of curriculum literacy?

2. Study Method

This descriptive study was conducted based on the relational survey model since it was aimed to determine the relationships between variables (Fraenkel, Wallen & Hyun, 2012). This study aimed to state the relationships between candidate teachers' motivation to teach and their curriculum literacy and to describe the explanatory power of motivation on the sub-dimensions of curriculum literacy.

2.1. Participants of the study

This study was conducted in the spring semester of the 2022-2023 academic year. The participants are studying at a state university located in the Marmara Region. Candidate teachers in their final year at the faculty of education. Candidate teachers are studying in 9 different teaching disciplines. In February 2023, due to the earthquake that occurred in Türkiye, the participants could be reached online. The participants of the study consisted of 154 pre-service teachers who voluntarily participated in the online forms. (see Table 1).

Table 1

Demographic Information of the Participants (Pre-service Teachers)

Demographic Information		f	%
Gender	Male	35	22.7
	Female	119	77.3
	Total	154	100

Table 1 shows that 22.7% of the participants were male and 77.3% were female. The higher number of female pre-service teachers compared to male pre-service teachers is in line with the gender distribution of students who prefer teacher education departments.

2.2. Data collection tools

In the study, a Personal Information Form including the participants' gender, age, and department of study was used. The Curriculum Literacy Scale was developed by Yıldırım (2019). The scale consists of five sub-dimensions: Philosophical Foundation, Social Foundation, Psychological Foundation, Measurement and Evaluation Foundation, and Content Knowledge. The scale items were prepared as a 5-point Likert scale. There is no reverse item in the scale. As a result of the first-level CFA, first and second-level CFA were performed. It was determined that the indices of the scale indicated acceptable to excellent values. As a result of the second-level CFA, it was reported that the scale was a strong component of a single construct. The Cronbach's Alpha reliability coefficients of the scale are .94 for the total scale, .84 for philosophical foundation, .85 for social foundation, .85 for psychological foundation, .89 for content knowledge, and .90 for assessment.

The Motivation to Teach scale - the scale developed by Kauffman, et al. (2011) - was adapted into Turkish by Ayık et al. (2015). The scale consists of two factors: extrinsic and intrinsic motivation. The adaptation of the scale was carried out with 210 pre-service teachers. Exploratory factor analysis revealed that the first factor (intrinsic) explained 38.36% of the variance, the second factor (extrinsic) explained 14.04%, and the two factors together explained .52 of the total variance. The correlation coefficient between these two factors was calculated as .31. The correlations of the items were reported to be above .30 and the correlation between them and the total score ranged between medium and high, and the correlation between the factors was reported to be .70. Confirmatory Factor Analysis results indicated that the fit indices of the scale were good and the structure was confirmed. Within the scope of the reliability analysis of the scale, the internal consistency coefficient (.84 for total score, .70 for intrinsic, .76 for extrinsic) and a two-half reliability coefficient (Spearman-Brown) were calculated. In the present study, Cronbach's Alpha Reliability value for Motivation for Learning-Teaching was .90, and .88 and .94 for Extrinsic and Intrinsic Motivation Subscales, respectively. Cronbach's alpha for Curriculum Literacies Competence was calculated as .79 for the total score, Philosophical Foundations of Education Literacy as .75, Social Foundations Literacy as .74, Psychological Foundations Literacy as .82, Assessment Literacy as .72, and Purpose and Subject Matter Knowledge Literacy as .71.

2.3. Data collection process

The measurement tools were conveyed to pre-service teachers through Google Forms, using WhatsApp group accounts of senior students in the main disciplines. The first part of the submitted forms included ethical information and the purpose of the research. In the second part, demographic information was asked. The third part included the scale items. The pre-service teachers were allowed to fill in the scales once and the scales were closed for a second time. Data were collected in March-April 2023. It took approximately one month to collect the questionnaires. This study was conducted in accordance with the decision of the university ethics committee dated 16.03.2023 and numbered 17/40.

2.4. Data analysis

Assumptions regarding the suitability of the data set for the analysis were tested. Variables are continuous variables at an equally spaced measurement level. Initially, the kurtosis-skewness and normality values of the variables were calculated, and after it was understood that the kurtosis and skewness values were within acceptable limits (Hair et al., 2013) and that the data were normally distributed, the mean and standard deviations of the total score of the Motivation to Teach and Curriculum Literacy scales and the scores for the sub-dimensions were calculated. The relationship between the variables was then examined using the Pearson Rank Difference Correlation Coefficient and it was found that there was a linear relationship between the variables. Simple linear regression analysis was conducted to determine the explanatory power of Motivation to Teach on Curriculum Literacy. To this end, whether the data set meets the necessary conditions for regression analysis was examined. Comparing the probability values according to Mahalanobis Distance and quartile, 1 data with probability values less than .01 was deleted from the data set, and the procedures (N=153) were carried out. The Residuals Statistical Table was examined in the next step and it was determined that the minimum-maximum values were between ±standard values of 3.29. In the same table, Cook's Distince row was examined and it was seen that the maximum value did not exceed 1, so it was understood that there were no outliers. A histogram graph was then examined to determine whether the errors were normally distributed or not, and it was observed that the distribution was similar to a bell curve and the points were parallel to the line. When the scatterplot graph is analyzed, it is understood that the variables are co-variance. At last, the Durbin-Vatson coefficient was calculated for simple linear regression to determine whether the errors are independent of each other. Since the coefficient is 2 in this study, it can be said that the errors are independent of each other. Multiple linear regression analyses were carried to state the effect of learning-teaching motivation sub-dimensions on curriculum literacy sub-dimensions. For the suitability of the data set for multiple regression analyses, Mahalanobis Distance and likelihood values according to the quartile were compared, and 1 data with a Cook's Distance value less than .01, Cook's Distance value above 1 and Centered Leverage value above 0.03 was deleted from the data set and the procedures (N=152) were carried out. The analysis revealed that the data set meets the conditions required for regression analysis (VIF <3; tolerance >.20; condition index <20).

3. Results

The variables of the study are abbreviated as Assessment and Evaluation Literacy (AEL), Subject Matter Literacy (SML), Philosophical Foundation Literacy (PhFL), Psychological Foundation Literacy (PsFL), Social Foundation Literacy (SFL), Program Literacy Total (PLT), Extrinsic Motivation (EM), Intrinsic Motivation (IM), and Total Motivation (TM). In the study, arithmetic means and standard deviations of the variables were calculated first. Table 2 presents the findings.

Table 2

Descriptive Statistics Values of Variables

DIMENSIONS	N	Minimum	Maximum	x̄	sd
Assessment	154	2.22	5.00	3.99	.69
Content Knowledge	154	2.75	5.00	4.23	.61
Philosophical Foundation	154	1.67	5.00	3.80	.79
Psychological Foundation	154	2.00	5.00	4.08	.70
Social Foundation	154	2.25	5.00	4.10	.68
Program Literacy Total	154	2.48	5.00	4.07	.56
Motivation Extrinsic	154	1.67	5.00	3.21	.75
Motivation Intrinsic	154	1.50	5.00	3.52	.75
Motivation Total	154	1.67	5.00	3.37	.67

Table 2 shows that the mean values of pre-service teachers' curriculum literacy scores were (x̄=4.07) for the total score of Program Literacy, (x̄=3.99) for the curriculum sub-dimensions of AEL (x̄=3.99), SML (x̄=4.23), PhFL (x̄=3.80), PsFL (x̄=4.08), SFL (x̄=4.10). The highest score that can be obtained from the Program Literacy scale is 5. Since their mean scores are above 4, it can be said that pre-service teachers' curriculum literacy is sufficient. The mean values of pre-service teachers' motivation for teaching and learning are for the total score (TM x̄=3.37), extrinsic sub-dimension (EM x̄=3.21), and intrinsic sub-dimension (IM x̄=3.52).

The relationships between learning motivation, learning motivation sub-dimensions, and Curriculum Literacy and its sub-dimensions were calculated with the Pearson Product Moment Correlation Coefficient. Table 3 presents the findings.

Table 3

Relationships Between Variables

Dimensions	Assessment	Subject Matter Knowledge	Philosophical Foundation	Psychological Foundation	Social Foundation	Motivation Extrinsic	Motivation Intrinsic	Program Literacy Total	Motivation Total
Assessment	1								
Subject Matter Knowledge	.77**	1							
Philosophical Foundation	.50**	.45**	1						
Psychological Foundation	.38**	.32**	.22**	1					
Social Foundation	.49**	.55**	.62**	.60**	1				
Motivation Extrinsic	.23**	.22**	.19**	.48**	.22**	1			
Motivation Intrinsic	.32**	.30**	.22**	.69**	.14	.59**	1		
Program Literacy Total	.90**	.88**	.69**	.37**	.74**	.26**	.31**	1	
Motivation Total	.28**	.27**	.22**	.60**	.23**	.95**	.79**	.30**	1

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3 shows that there is a moderate positive correlation between the AEL sub-dimension of the curriculum literacy scale and the other sub-dimensions of the curriculum literacy scale, namely, SML (r=.77), PhFL (r=50), PsFL (r=.38), and SFL (r=49). Table 2 also shows that the Subject Matter Knowledge Literacy Total sub-dimension is positively and moderately correlated with PhFL (r=.45), PsFL (r=.32) and SFL (r=.55). The PhFL sub-dimension is positively and moderately correlated with PsFL (r=.50) and SFL (r=.62). The PsFL sub-dimension is also positively and moderately related to SFL (r=.60). It can be said that the relationship between the total score of the curriculum literacy scale and its sub-dimensions (r=.37-.90) is positive and varies at medium-high levels. It can be said that there are positive and high-level relationships between the total score of curriculum literacy and AEL (r=.90), SML (r=.88), PhFL (r=.69), and SFL (r=.74) respectively. It is seen that the total score of the Motivation for Teaching and Learning scale is highly and positively correlated with the Extrinsic (r=.95) and Intrinsic dimension (r=.79). It can be said that intrinsic and extrinsic motivation (r=.59) are positively and moderately related. It is understood that intrinsic motivation is related to the sub-dimensions of the Curriculum Literacy Scale: AEL (r=.32), SML (r=.30), PhFL (r=.22), PsFL (r=.69) and SFL (r=.14). It is understood that extrinsic motivation is related to the sub-dimensions of the Curriculum Literacy Scale: AEL (r=.23), SML (r=.22), PhFL (r=.19), PsFL (r=.48) and SFL (r=.22). These findings indicate that intrinsic motivation is moderately related to the assessment and purpose-subject matter literacy dimensions of curriculum literacy, and although the relationship with philosophical foundation and social foundation literacies is positive, its strength is quite weak. Extrinsic motivation was positively correlated with all sub-dimensions of curriculum literacy, but the strength of the relationship with the sub-dimensions other than PsFL (r=.48) was quite low. It was also found that there was a positive and moderate relationship between the total scores of curriculum literacy and learning-teaching motivation (r=.30).

In the study, simple linear regression analysis was conducted to determine the effect of Learning-Teaching Motivation on Curriculum Literacy. Table 4 presents the findings.

Table 4

Regression Analysis of Motivation in Predicting Curriculum Literacy

Model		Predicted Variable: Curriculum Literacy								
Independent Variable	Dependent Variable	B	ShB	β	t	p	R	R^2	F	p
Motivation	Constant	.28	.06	.33	4.72	.00	.33	.11	22.368	.00

Table 4 shows that the regression model is significant since the significance level is p<.05. According to the regression analysis results, the explanatory power of motivation for curriculum literacy is positive but weakly significant. Only .11% of the variance in curriculum literacy is explained by the motivation to teach variable (R=.33; R2=.11; p<.05). The β coefficient of the program motivation (independent) variable included in the model is .33 (p<.05). According to this finding, motivation (significance value p<.05) is effective on curriculum literacy. Table 5 presents the results of the multiple regression analysis conducted to determine the effects of Curriculum Literacy on Assessment Literacy, Intrinsic and Extrinsic Dimensions of Motivation to Learn.

Table 5

Regression Analysis Results on the Prediction of Assessment Literacy

Model	Predicted Variable: Program Literacy (Assessment)						
Variables	B	ShB	β	t	p	Binary r	Partial r
Constant	2.8	.27		10.34	.00		
M_EXT	.00	.04	.004	.04	.30	.00	.00
M_INT	.32	.08	.345	3.63	.00	.28	.28
R=.35	R^2=.12	Ad. R^2=11	F=10.30	p=.00			

Table 5 shows that there is a positive and significant relationship between Assessment Literacy and Intrinsic Motivation (t=-3.63 p≤.05). These two variables explain .12% of the variance in Assessment Literacy (R=.35; R^2=.12, Ad. R^2=.11). The standardized (β) indicates that the relatively important predictor variable for assessment literacy is intrinsic motivation. Considering the t-test results, it is understood that the Internal Motivation variable has a significant effect on Assessment Literacy, while External Motivation does not have a significant effect. Extrinsic Motivation has no significant effect on Assessment Literacy.

Multiple regression analysis was performed to determine the effects of Intrinsic and Extrinsic Dimensions of Motivation to Learn on the Subject Matter Knowledge Literacy of Curriculum Literacy. Table 6 presents the findings.

Table 6

Regression Analysis Results on the Prediction of Subject Matter Knowledge Literacy

Model	Predicted Variable: Program Literacy (Subject Matter Knowledge)						
Variables	B	ShB	β	t	p	Binary r	Partial r
Constant	2.83	.27		10.35	.00		
M_EXT	.00	.08	.00	.04	.96	.00	.00
M_INT	.32	.08	.34	3.63	.00	.28	.28
R=.35	R^2=.12	Ad. R^2=11	F=10.30	p=.000			

In Table 6, the relationship between Subject Matter Knowledge Literacy and Intrinsic Motivation is positive and significant (t=-3.63 p≤.05). These two variables explain .12% of the variance in Subject Matter Knowledge Literacy (R=.35; R^2=.12, Ad. R^2= 11). The standardized (β) indicates that the relatively important variable affecting Subject Matter Knowledge Literacy is Intrinsic Motivation. According to the t-test results, it is understood that Internal Motivation has a significant effect on Subject Matter Knowledge Literacy, whereas External Motivation does not have a significant effect.

Multiple regression analysis was performed to determine the effects of Intrinsic and Extrinsic Dimensions of Motivation to Learn on the Psychological Foundation Literacy of Curriculum Literacy. Table 7 presents the findings.

Table 7

Multiple Linear Regression Analysis Results for Predicting Psychological Foundation Literacy

Model	Predicted Variable: Program Literacy (Psychological Foundation)						
Variables	B	ShB	β	t	p	Binary r	Partial r
Constant	3.15	.28		10.94	.00		
M_EXT	.13	.09	.14	1.44	.15	.11	.11
M_INT	.14	.09	.15	1.52	.13	.12	.12
R=.26	R^2=.07	Ad. R^2=.05	F=5.36	p=.00			

In Table 7, the relationship between Psychological Foundation Literacy and Intrinsic Motivation is not significant (t=-1.52 p≥.05). The relationship between Psychological Foundation Literacy and Extrinsic Motivation is not significant (t=-1.44 p≥.05). These two variables explain .07% of the variance in Psychological Foundation Literacy (R=.26; R^2=.07, Ad. R^2=.05). İt can be said that the relative order of importance of the variables affecting Psychological Foundation Literacy is Intrinsic Motivation and Extrinsic Motivation. T-test results show that the sum of Intrinsic and Extrinsic Motivation variables has a significant effect on Psychological Foundation Literacy, while the effect of Intrinsic and Extrinsic Motivation alone is not significant.

Multiple regression analysis was performed to determine the effects of Intrinsic and Extrinsic Dimensions of Motivation to Learn on the Philosophical Foundation Literacy of Curriculum Literacy. Table 8 presents the results.

Table 8

Regression Analysis Results on the Prediction of Philosophical Foundation Literacy

Model	Predicted Variable: Program Literacy (Philosophical Foundation)						
Variables	B	ShB	β	t	p	Binary r	Partial r
Constant	2.88	.32		8.76	.00		
M_EXT	.12	.10	.11	1.15	.25	.09	.09
M_INT	.15	.10	.14	1.40	.16	.11	.11
R=.23	R^2=.05	Ad. R^2=.03	F=4.00	p=.00			

In Table 8, the relationship between Philosophical Foundation Literacy and Intrinsic Motivation is not significant (t=1.40 p≥.05). The relationship between Philosophical Foundation Literacy and Extrinsic Motivation is not significant (t=1.15 p≥.05). These two variables explain .05% of the variance in Philosophical Foundation Literacy (R=.23; R^2=.05, Ad. R^2=.03). It can be said that the relative order of importance of the variables affecting Philosophical Foundation Literacy is Intrinsic Motivation and Extrinsic Motivation. T-test results show that Internal and Extrinsic Motivation variables together have a significant effect on Philosophical Foundation Literacy, while the effects of extrinsic and intrinsic motivation alone are not significant.

Multiple regression analysis was conducted to determine the effects of Intrinsic and Extrinsic Dimensions of Learning Motivation on Sociological Foundation Literacy of Program Literacy and the results are presented in Table 9.

Table 9

Regression Analysis Results on the Prediction of Sociological Foundation Literacy

Model	Predicted Variable: Program Literacy (Sociological Foundation)						
Variables	B	ShB	β	t	p	Binary r	Partial r
Constant	3.35	.28		11.96	.00		
M_EXT	.15	.08	.17	1.78	.07	.14	.14
M_INT	.06	.09	.07	.72	.47	.05	.05
R=.22	R^2=.05	Ad. R^2=.03	F=4.03	p=.02			

In Table 9, the relationship between Sociological Foundation Literacy and Intrinsic Motivation is not significant (t=72 p≥.05). The relationship between Sociological Foundation Literacy and Extrinsic Motivation is not significant (t=1.78 p≥.05). Together, these two variables explain .05% of the variance in Sociological Foundation Literacy (R=.22 R^2=.05; Ad. R^2=.03). It can be said that the relative order of importance of the variables affecting Sociological Foundation Literacy is Extrinsic Motivation and Intrinsic Motivation. T-test results indicate that the effect of Intrinsic and Extrinsic Motivation variables on Sociological Foundation Literacy individually is not significant, but together they have a significant effect.

4. Conclusion, Discussion, and Suggestions

In this study, it was aimed to examine the relationships between motivation to teach and curriculum literacy of pre-service teachers studying in the final year of teacher education. The outcomes show that candidate teachers have a moderate level of motivation to teach. Candidates' intrinsic motivation levels are relatively higher than extrinsic motivation levels. Because an arithmetic mean between 3-4 points to a moderate level of teaching motivation (Ayık et al., 2015). The relationship between the total score of motivation to teach and intrinsic and extrinsic motivation was found to be quite high. The relationship with the extrinsic motivation dimension of the total score of motivation to teach is higher than the intrinsic dimension. The relationship between extrinsic and intrinsic motivation dimensions is close to the previously known study results of the scale (Ayık et al., 2015). The total scores of pre-service teachers' motivation to teach at the entry into the teaching profession were moderate. These results can be considered positive in terms of teacher education since their intrinsic motivation is relatively high. In the last decade, the transformation of the teaching profession into a career profession, efforts to increase its prestige, and the fact that it is a profession that carries a state guarantee may have led to a partial increase in the motivation of pre-service teachers to teach.

Motivation to teach at the beginning of teacher education can be influenced by pre-service teachers' attitudes towards the teaching profession (Ayık & Ataş, 2014). It is known that pre-service teachers' possible selves also have effects on their motivation to teach (Gün & Turabik, 2019). Besides, this motivation at the beginning may affect the self-efficacy beliefs of the candidates (Saracaloğlu & Dinçer, 2009). As the participants of this study were senior students, the teaching practice courses they had taken may have had a positive effect on their motivation. Considering these results together, it can be thought that the candidates' moderate motivation to teach and high intrinsic motivation levels may be the basis for their high motivation to teach in the future and their self-efficacy beliefs may also be high. The intrinsic motivation of pre-service teachers must be high. Thus, it can be said that candidates tend to shape their tendency to teach for more decisive reasons such as liking teaching, satisfaction, and enjoyment of the job instead of external reasons such as finding a job easily, having many job

opportunities, and having a good future position. It is considered as an indicator that they will be able to do their professions in the future with love and without financial expectations (Gün & Turabik, 2019). It is thought that the pre-service teachers who are the participants of this study will do their jobs with love and that they will do their jobs with the pleasure of being a teacher and the desire to teach rather than factors such as reward-money-status. Considering the opinions that teachers with high motivation to teach can communicate better with their students and that students have higher motivation to learn (Vermote et al., 2020), it can be assumed that the pre-service teachers in this study will be able to progress toward becoming teachers with the desired qualifications in the future.

It can be said that candidate teachers' curriculum literacy levels are high. Pre-service teachers have a very high average level in the content and subject matter knowledge literacy dimension of the curriculum. They received the lowest score in the Philosophical Foundation Literacy Dimension. This was followed by the Assessment Literacy sub-dimension score. These results suggest that pre-service teachers perceive themselves as highly competent in the dimensions of Content Knowledge and Content Knowledge, Social and Psychological Basic Literacies. According to these results, it can be said that pre-service teachers see themselves as highly competent in the dimensions of Subject Matter Knowledge and social and Psychological Basic Literacies. Similar results were found in studies on the curriculum literacy of teachers/pre-service teachers (Aslan & Gürlen, 2019; Erdem & Eğmir, 2018). Although the curriculum literacy levels of senior student pre-service teachers, in general, were found to be high in this study, the fact that, like teachers (Kahramanoğlu, 2019), their competencies in understanding the philosophical principles of the curriculum and in selecting and applying appropriate assessment and evaluation approaches are partially sufficient points to knowledge gaps in this regard. Participant pre-service teachers may have difficulties in understanding and implementing the underlying philosophies and assessment activities during the lesson planning phase in the future. It is therefore advisable to design activities that raise the awareness of pre-service teachers about the philosophical and social foundations behind lesson planning.

The teachers' relatively low philosophical and assessment literacy may be due to two reasons. The first one may be that these two subjects contain concepts that are relatively difficult for pre-service teachers in terms of learning content, and the second one may be that the structure of the curricula negatively affects literacy in these two foundations. In a study by Dedeoğlu and Polat (2021) in which they evaluated primary school curricula, it was determined that especially in the MoNE course-based curriculum development studies, problems continue within the scope of philosophical foundations, levels of achievements, curriculum design, and content regulation. Kalender and Baysal (2021) found that the compatibility between the textbooks and the curriculum in terms of the elements of the curriculum was not sufficiently taken into account in the Life Sciences course. Although the results of a study examining assessment, one of the components of secondary mathematics curricula, showed that teachers had difficulties in preparing measurement tools despite adopting the principles for the assessment and evaluation component (Tuncel & Kazu, 2019). These and similar problems may also affect pre-service teachers' curriculum literacy competencies. It is also known that pre-service teachers' approaches to assessment are shaped by learning experiences, context, and personal dispositions (Coombs et al., 2020). Even though the participants in this study were senior students, their curriculum evaluation literacy may be partially adequate due to their inability to sufficiently internalize their learning experiences in assessment, their negative attitudes towards assessment and evaluation, and their lack of experience.

One of the other results of the study shows that the psychological, social, and philosophical sub-dimensions of the curriculum literacy scale are moderately related. There was a high correlation between subject matter knowledge and assessment foundation. Assessment is an essential process in teachers' lesson planning in terms of informing students about their learning process and monitoring their learning progress (Slavin, 2013). Pre-service teachers have to consider assessment and evaluation

activities in lesson planning. The relationship between subject matter knowledge and assessment foundation may be high for this reason. Besides, the sub-dimensions of curriculum literacy other than psychological base literacy were found to have a low correlation with both total motivation to teach and intrinsic and extrinsic motivation. The obtained result may be due to motivation to teach and psychological foundation literacy being patterned with more effective content. Psychological foundation literacy, as it is known, has contents based on human development and learning. Therefore, motivation to teach may be relatively more related to other program literacy sub-dimensions with a psychological foundation. In conclusion, motivation to teach can be said to be one of the factors related to curriculum literacy.

The effect of extrinsic and intrinsic dimensions of motivation to teach on the literacy of all sub-dimensions of curriculum literacy together was found to be positive but weak. The variance explained by the motivation to teach in Subject Matter Knowledge and Assessment Literacy dimensions is relatively higher than the other sub-dimensions. Nevertheless, the effect of intrinsic motivation is significant in these two dimensions, whereas the effect of extrinsic motivation is not significant. Considering these results together, it can be suggested that approaches that address the elements of curriculum literacy in a way that includes Subject Matter Knowledge and Assessment Literacy should be carefully evaluated. That only the contribution of intrinsic motivation to teaching motivation explaining these dimensions was found to be significant suggests that the curriculum literacy competencies of the senior students, who are the participants of this study, are partially shaped by the effect of intrinsic motivation.

It can be thought that candidate teachers with high intrinsic motivation tend to see themselves as competent in literacy in planning teaching, determining educational situations, selecting and applying appropriate assessment approaches with the pleasure they get from their profession, and with the consciousness of belonging. The effect of the teaching practices in the last year and the micro-teaching practices in the courses in the previous years may also affect this result. Besides, during their teaching practice, pre-service teachers' peer teaching, in-class experiences, and continuous lesson planning may have led them to feel their literacy towards these two sub-dimensions of the curriculum more adequate than other dimensions. Just as teachers need subject matter knowledge to make evaluations about a subject (Kahramanoğlu, 2019), pre-service teachers need subject knowledge to make evaluations about curriculum literacy.

The result that the variance explained by the motivation to teach the curriculum is weak is in line with the results of Dağ (2021). In this study, the fact that the effect of teaching motivation on curriculum literacy was found to be weak suggests that future studies should focus on different variables such as teaching practice experiences, peer teaching, professional course teaching micros, self-efficacy beliefs, and self-perceptions that may affect teaching/education curriculum literacy or motivation to teach. Mixed studies can also be conducted on the reasons why candidates find themselves sufficient based on subject matter knowledge. It can be said that program literacy in teaching/education is more based on conceptual and applied knowledge, and factors such as lesson planning skills and experience should not be overlooked.

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Research Article

Reflection of Gender Norms in Kyrgyz and Turkish Tales on Social Life

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Abstract: The messages on gender roles given through fairy tales, which contain elements related to the structure of society, cause children to internalize the knowledge and behavioral patterns they have acquired since their early ages, to be exhibited at later ages. This study was carried out to scrutinize the gender norms in Kyrgyz and Turkish fairy tales, revealing their similarities and differences, and examining the reflection of these norms on social life. A case study model, one of the qualitative research methods, was used and data was collected through document review and interview techniques. The documents (fables), used in the study, were determined using the stratified purposeful sampling method. Among the tales reached in the first stage, the ones in the realistic tale type and enriched with extraordinary elements were selected: a Kyrgyz and a Turkish tale with a family theme were selected from these tales. Tales were examined in terms of the gender norms they contain. The contents of the tales were analyzed in detail with the descriptive analysis technique. Individual interviews were conducted with 2 Kyrgyz students living in Türkiye and 2 Turkish students living in Kyrgyzstan, and the data were analyzed with the descriptive analysis technique. In the research, different gender norms in both tales were determined and it was concluded that these norms were reflected in social life. These norms have emerged in the form of supporting the patriarchal structure in the Turkish fairy tale while in the Kyrgyz fairy tale, the woman is considered to be precious.

Keywords: Metaverse in Education, Systematic Literature Review, Virtual Learning Environments (Vles), Educational Technology Integration, Pedagogical Innovation

1. Introduction

The way societies live and believe is shaped by the transfer of internalized stereotypes into life. Therefore, early childhood is very important in terms of acquired and internalized stereotypes. It is difficult to change the knowledge and behavioral patterns acquired during this period in the following years (Temellioğlu, 2021). Fairy tales embellish the moral norms and culture of the society they belong to with some motifs, conveyed to their readers and listeners through extraordinary heroes. Thus, they are of great importance for the development and education of children, who constitute their most important audience (Iğdır, 2014; Pawlowska, 2021; Yılmaz, 2012).

Fairy tales, which are the cultural heritage of the societies and derived from oral tradition, are generally loved by children. It is distinguished from other folklore and narrative stories, such as myths and legends, which involve worldviews, traditions, and belief in the truth of undesired events. However, it is extremely difficult to find a concrete definition or boundary that would fully encompass the fairy tale genre; in fairy tales, the themes and consequences of events are so broad that their elements often do not match each other (Lester, 2015). Nevertheless, the fable could be considered to belong to a type of storytelling that typically involves legendary fantasy characters and explicitly moral tales (Rahman, 2017). In other words, a fairy tale is a type of narrative that is not related to reality, is a product of imagination, and does not attempt to convince anyone. Fairy tales influence listeners and draw them into their own imagination due to the irrationality of their heroes, supernatural subjects, and imaginary events and situations (Bilkan, 2009).

The ubiquity of tales allows the genre to be inclusive and integrate a variety of different stories. Since human beings have encoded a lot of the information they have obtained about nature into myths, epics, stories and tales, they have tended to ensure their continuity on earth and to continue their lineage.

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Moreover, man's struggle against nature has also been decisive in his sphere of power. Therefore, within cultural continuity, the possibility of heroes, carrying such a seed of knowledge in the form of displayed power should be considered (Ölçer Özünel, 2015). However, two elements that all stories in the genre share are the acceptance of the fantastic as plausible and the ability of societies to teach a moral lesson to their members. These two alleged components of the fairy tale genre are based on the fact why so many different tales share a mystical foundation (Lester, 2015).

Fairy tales exist in all cultures and, as is known, they are an important part of Turkish culture. Although the events fictionalized in the content of fairy tales are constructed as products of imagination, they are from our lives and have traces of real life. In order for the fairy tale text to have a social meaning, the teller of the tale must tell it in front of a certain group. The fact that he belongs to that group allows him to reflect the audience's ideas and feelings into the tale. Hence, the values and structure of the society to which that group belongs shape the content of the tale (Diaz-Faes et al., 2024). The events and heroes in the tales of the Turkish world are often structured in a way that includes contrasts. What is told in fairy tales is generally about the struggle of good with evil, beauty with ugliness, and poverty with wealth. At the beginning of most tales, the good ones are portrayed as failures, but in the end, they achieve success. While the good ones are rewarded, the bad ones are punished alike. In fairy tales, characters must suffer and be patient in order to achieve happiness, because it cannot be achieved without a struggle and effort (Bakırcı, 2015; Bozkırlı, 2018).

Kyrgyz people, one of the Turkish tribes, have a very rich oral culture which contains epics, legends, proverbs, folk songs, and tales. Information about their rich history, their ideas about future and their life experiences could be found in their oral heritage. Manas Epic is one of the great example for Kyrgyz oral culture (Abalova, 2019; Singh, 2022). Fairy tales, which contain a lot of information about the traditions, philosophy, and history of the Kyrgyz society, also contain traces of natural events. Thus, it is possible to see the people's wishes and ideals for the future from the extraordinary ideas and thoughts of fairy tales (Doğan, 2009). Kyrgyz people use the term “cöö comok” for the tale, which is expressed with different names among Turkish tribes. However, “comok” is mostly used for epics and narrators are called “comokists”. The word “cöö comok” is separated from the tale or epic by adding the word cöö (pedestrian) to the beginning of the word comok, which refers to being told in prose form, apart from poetic elements. It is seen that epics are given priority in studies on Kyrgyz folklore. However, the tale did not receive the attention that the epics, particularly the Manas epic, received. For this reason, it is not often possible to find an independent study on Kyrgyz tales in general (Karadavut, 2015).

Since antiquity, the Kyrgyz have preserved their unique national heritage through oral traditions, similar to other cultures, passing it down from one generation to the next by word of mouth. The Kyrgyz people possess a wealth of fairy tales that emphasize virtues such as honesty, justice, good conduct, and moral education, conveying these key themes (Sotvoldiev, 2022). The structure of Kyrgyz tales is not very strong, with the beginning, transition, and ending sections sometimes comprising just a word or two. Almost all of the texts in printed sources appear as processed texts. The structuring of events and the inclusion of epic elements in the heroes are important features of Kyrgyz tales. The birth of a hero, the characteristics of the horse he owns, the companions he acts with, and his efforts to achieve success in the end contain epic features. Many of the Kyrgyz tales are in the form of long texts. There are tales which could reach 8 or 10 pages (Karadavut, 2015).

In Kyrgyz tales, in addition to characters such as giants, dragons, witches and copper-nosed creatures, there are also flying carpets, flying horses, unfolding tables, alpine blackbirds and some magical tools. The thoughts of the people reflected in Kyrgyz tales are generally about being fair, being cruel, friends, enemies, good will and bad will. In some tales, heroes fight against powerful elements such as the seven-headed dragon, while in others they fight against witches or giants. The places, where these extraordinary wars took place, are not ordinary places. Struggles take place in places that are not easily

accessible, such as the sky, underground, mountain peaks or the desert. In fairy tales, heroes fall into distinct categories. Firstly, there are the main heroes who drive the story forward. Secondly, their assistants support them in their quests. The third group comprises adversaries like dragons, witches, and giants who oppose the heroes. Additionally, heroes possess enchanted objects such as flying carpets, magic tables, daggers, and rings, which play crucial roles. Another category includes fantastical mounts like winged horses and alpine blackbirds, adding further enchantment to these tales. The real heroines of the tales are the smart lady and her smart daughters. The reason why they appear in fairy tales is their beauty and intelligence. They help, advise, and guide the heroes. These girls play a big role in helping the heroes to defeat the enemy and perform some difficult tasks (Kaçmaz, 2020; Özen, 2008) Like the characters in fairy tales, Kyrgyz female heroes are depicted as young, beautiful, and intelligent, often portrayed as superior to men. This portrayal serves as a balancing element against the relatively less pronounced sexual oppression in the nomadic Kyrgyz society compared to settled communities (Dor, 2022).

Fairy tales provide pleasure to individuals by portraying fascinating life events in a delightful, engaging, extraordinary, and flawless manner, often conveying exemplary ideas that blend elements of imagination and reality (Sobirjonovna, 2022). Fairy tales also attract the attention of young children because they contain extraordinary elements, heroic stories, and the victory of the good guys (Yılmaz, 2012). Thanks to this structure, fairy tales provide closeness to young children who have a wide imagination. In a way, fairy tales reflect the inner world of children. For this reason, it gives children great pleasure, who are fascinated with the mystical stories.

On the other hand, it is believed that fairy tales have an effective role in the education of children because they reveal a primitive way of thinking that is very close to the way children think (Hohr, 2000) because they have the ability to influence the virtues, expectations, entertainments and aspirations of the members of society (Lester, 2015). Therefore, while children enjoy listening to fairy tales, their development is also supported. Fairy tales are especially effective in cognitive, language and social development. It enables the development of mental activities by activating the imagination. Through fairy tales, children are provided with skills such as reaching a conclusion by analyzing events, distinguishing between good and bad by identifying with the personality traits of heroes, acquiring social skills such as making friends and helping each other, and improving their native language by acquiring new words and structures (Şahin, 2011). In this respect, fairy tales are used as a reliable stimulus to give advice to children, particularly in early childhood education. It is conveyed via the aim of giving a moral message or advice. Children are guided to delve into a tale and then indirectly invited to imitate the message, which would later become a foundational trait in their personality when they grow up (Sayer et al., 2018).

When parents want to share certain experiences with children, they could use fairy tales as a strategic tool to convey their true intentions in a way that pleases the children. Children with wide imaginations are very impressed by fairy tales due to their extraordinary elements, heroism, and the fact that the good people usually win. The important thing is to understand the “hint” of the tale, which in essence fully corresponds to the nature of a small child, close to their mindset, and to correctly convey its meaning to young children. Through fairy tales, children are conveyed with the distinction between good and bad, the moral principles and cultural values of the society (Sobirjonovich & Bahromjon, 2022). With all these features of fairy tales, it is aimed to develop moral qualities, kindness, generosity, diligence, and accuracy in children. However, Sezer (2013) stated that writers, interested in children's literature, often question the negative effects of classical fairy tales on children based on violence. He stated that the codes, ingrained in the sub ego during childhood, continue their functionality as an ideological tool, particularly by putting pressure on the female character, and naturally affect the male identity. In this respect, fairy tales are important tools through which cultural expectations, regarding

gender are conveyed to children. Fairy tales, which contain some culture-specific elements related to gender, cause the internalization of gender norms (İshakoğlu, 2020; Meland, 2020).

Children code and organize in their minds the gender schema they develop by observing the society they live in (Bem, 1983). In addition to children's observation of the adults around them, fairy tales that transmit the culture of the society are also effective in shaping social roles. Gender-related norms, shaped in line with culture, are reflected in the event pattern in fairy tales and the personality characteristics and roles of the heroes. By identifying with these heroes, children acquire the gender roles reflected in the tale. However, events and concepts, related to society's gender norms that are difficult for a preschool child to understand, cause them to internalize the knowledge and behavioral patterns acquired at a young age later to exhibit in following ages (Shaheen et al., 2019; Temellioğlu, 2021).

Even though it derives its source from individual desires, its survival depends on social acceptance since it is based mostly on folk narrative tradition. For this reason, comparing the popularization rates of fairy tales from different ideologies allows us to monitor what the average culture absorbs and where it resists. Tales, involving sexism and gender segregation, advocate the system/government rather than questioning it. Also, they reinforce the pattern of love and family relations despite its drawbacks, thus, they become widespread and preferred. This situation aims to enable children to adapt to society by causing gender roles to be transferred as a template and the formation of gender stereotypes of the society (Sezer, 2013).

For this reason, determining how gender-related norms are included in the fairy tales of two different Turkish societies and examining how these elements are transferred to social life is important in terms of the use of fairy tales in the educational processes of young children. Therefore, this study aims to compare the position of individuals in the family, their status, their responsibilities, their functions, and gender norms in Kyrgyz and Turkish cultures through fairy tales.

This study is important in terms of revealing how important fairy tales are, as a part of cultural heritage, in transferring social and gender norms in children's education. Additionally, the study of Kyrgyz and Turkish tales offers a valuable research area to understand the gender norms and social structures of both societies. Therefore, "How do stereotypes about gender roles in fairy tales take place in Kyrgyz and Turkish societies?" and "How do the stereotypes in fairy tales reflect on social life?" questions were answered.

2. Method

2.1. Research model

This study is a case study from qualitative research methods. A case study is an empirical research method that studies a current phenomenon within its real-life framework, is used when the boundaries between the phenomenon and its context are not clear-cut and there is more than one evidence or data source (Yıldırım & Şimşek, 2016; Yin, 2009).

2.2. Data collection

The data of the research was obtained through documents and interviews.

2.3. Documents

The documents of the research were determined through the stratified purposeful sampling method. The following steps were used during document selection. In the first stage, in order to reach Kyrgyz and Turkish tales, the resources in the National Thesis Center of the Publications and Documentation Department of the Council of Higher Education were reviewed. In the second stage, the obtained tales

were examined in terms of their types and those that were realistic tales enriched with extraordinary elements were determined. In the last stage, a Kyrgyz and a Turkish fairy tale that overlapped with the purpose of the research and contained the theme of family were selected. While selecting these tales, an expert in Turkish Language and Literature was consulted. "The Seven Sons of the Old Woman", selected from Kyrgyz tales, and "The Fairy Hand", selected from Turkish tales, were examined in terms of the gender norms they contain. That's why, in this study, a Turkish and a Kyrgyz tale were chosen as texts. This study is limited to two tales that are assumed to reflect Kyrgyz and Turkish tales.

Information about the documents is given in Table 1.

Table 1

Selected Fairy Tales as Document

Fairy Tale Name	Society to which it belongs	Writer
The Old Woman's Seven Sons	Kyrgyz	Anonymous
Haunted Hand	Turkish	Anonymous

2.4. Interviews

Interviews were conducted with 2 Kyrgyz students living in Türkiye and 2 Turkish students living in Kyrgyzstan, selected by easily accessible sampling method. It was taken to ensure that the participants were equal in number, male and female, that their education levels were equivalent, and that they had lived in that country for at least 1 year.

Information about the participants is given in Table 2.

Table 2

Information about Interviewed Participants

Participant Code	Gender	Place of birth	Country of residence/Life expectancy	Educational Status
K1	Female	Kyrgyzstan	Türkiye /5 years	Graduate
K2	Male	Kyrgyzstan	Türkiye /4 years	Undergraduate
T1	Female	Türkiye	Kyrgyzstan/7 years	Graduate
T2	Male	Türkiye	Kyrgyzstan/1 year	Undergraduate

2.5. Data analysis

Both documents and interviews' data were analyzed by descriptive analysis. After analysis data were presented with displays and tables. All findings were supported with "quotations".

2.6. Documents

The descriptive analysis process was carried out in 4 stages. First, a framework was created for data analysis in terms of the gender norms contained in the fairy tales. According to this framework, it was determined under which categories and themes the data would be collected and which themes would be arranged according to which categories. The data obtained was read and arranged in detail according to the thematic framework created. The edited data were described and supported with direct quotes where necessary. The identified findings were interpreted. (Creswell, 2002; Marshall & Rossman, 2014; Miles & Huberman, 1994; Seidman, 2006). Accordingly, fairy tale heroes were evaluated under 3 themes: mood and personality traits, physical characteristics of the heroes, and actions attributed to the heroes, within the framework of the concepts attributed to them as men and women.

2.7. Interview

5 open-ended questions were prepared for the interview part of the research. After receiving expert opinions, the interview was conducted with 4 open-ended questions, with 1 question removed. The interviews were conducted online with 2 Kyrgyz students living in Türkiye and 2 Turkish students living in Kyrgyzstan. In the interviews, "What are your views on gender equality and its applicability in Kyrgyzstan and Türkiye?", "Do you think that Kyrgyz and Turkish societies have gender stereotypes in general? Explain", "How would you evaluate the situation of gender equality/inequality in educational institutions (kindergarten, primary school, high school, university, etc.)?", "Do you think gender roles are reflected in fairy tales? How?" questions were asked.

The data obtained from the interview were analyzed with the descriptive analysis technique and norms regarding gender in fairy tales; gender norms reflected in society; Gender norms in educational institutions were examined under three main themes.

2.8. Trusthworthiness

The items, under each heading obtained from the analysis, were coded independently by two researchers. In the analysis of the document and the interview, the percentage of agreement between independent raters was calculated separately using the formula (Number of Agreement / (Number of Agreement + Number of Disagreements) x100). Compliance percentages in document analysis were 0.91; in the interview analysis, it was found to be .86.

2.9. Ethical issues

Ethics committee permission for the study was received with the letter of Başkent University Academic Evaluation Coordinatorship dated 24.01.2023 and numbered E-62310886-605.99-200150.

3. Findings

The findings of the research were examined under two headings: The findings obtained from the analysis of the tales and the findings obtained from the analysis of the interviews.

3.1. Fairy tales' findings

The chosen fairy tales were read in detail by the researchers and the words and descriptions containing gender norms for men and women, were conceptualized by placing them under the headings of "mood and personality traits, physical characteristics of the heroes, actions attributed to the hero" and are presented below.

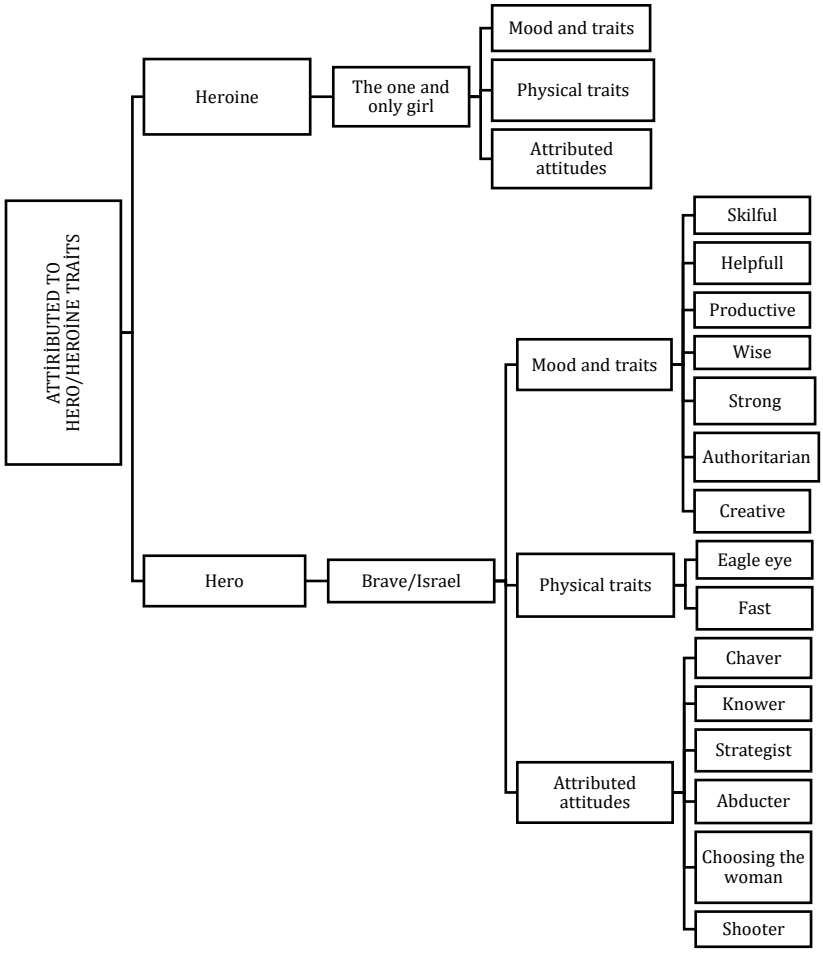
3.2. Kyrgyz fairy tale "The old woman and her seven sons"

In the Kyrgyz fairy tale "The old woman and her seven sons", male heroes are often characterized by their physical strength, courage, and dexterity, while female heroes are less involved in the main plot of the tale. While the seven sons, the main characters of the tale, form the plot, the old woman appears only as a figure listening to the story of her children.

While male heroes stand out with their physical strength and skills, female heroes play more supporting or secondary roles. In the tale, the old woman only listens to her children's story and plays a guiding role but does not take any action that affects the events of the story. It is, in the tale, also emphasized that men are active and strong, and the female heroes play a role that helps or supports them.

Figure 1

The Old Woman's Seven Sons (Kyrgyz tale)



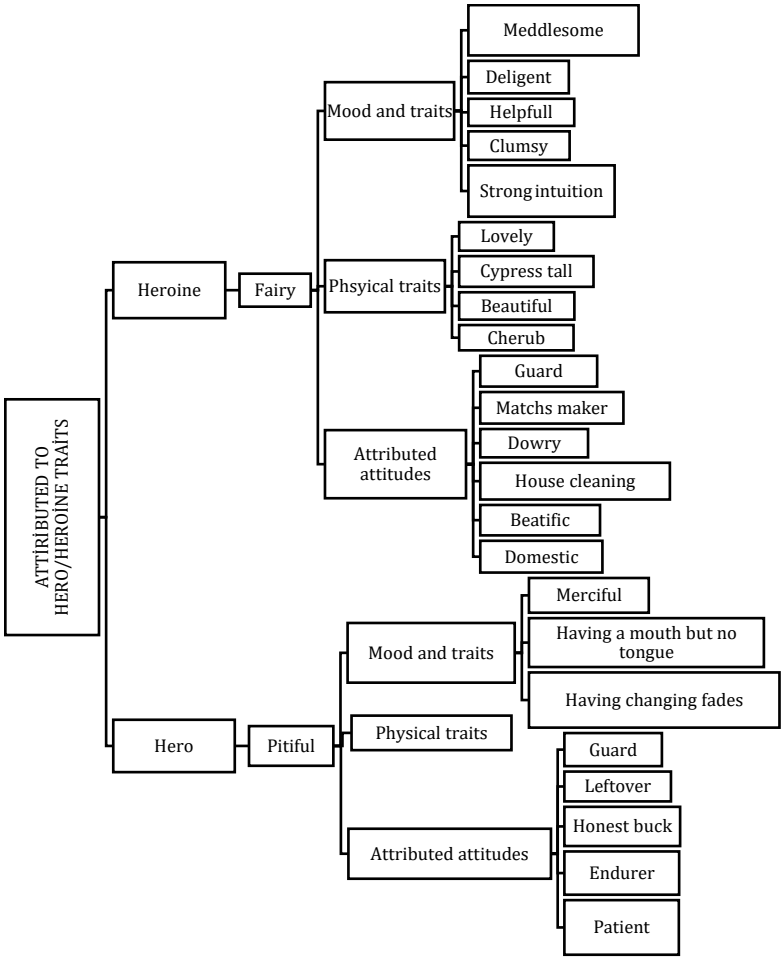
In Figure 1, the traits attributed to the heroes in the Kyrgyz fairy tale are categorized separately for men and women. Accordingly, with the description of 'Brave and Israel', it is seen that the mood and personality traits of being strong, helpful, skillful, authoritarian, creative, productive and wise are attributed to men. At the same time, men are given the physical characteristics of speed and eagle eyes and the actions of being aware, following, choosing the women, abductor, shooter and being a strategist. In the Kyrgyz fairy tale, it is emphasized that women are very valuable with the description of 'the one and only girl', but in the Kyrgyz fairy tale, there are no descriptions of mood, personality, physical traits, and attributed actions.

3.3. Turkish fairy tale "Perili El"

In the Turkish fairy tale "Perili El", the female protagonist is depicted in a role limited to being busy with household chores, while her husband, the male protagonist, is praised. A woman's value is measured by doing housework and making her husband happy, which shows that a woman's success and value are limited to housework. It appears as a gender role for the husband not to do any work and for the woman to be responsible for all household chores. However, in the tale, fairies, assisting the female character by doing their work, symbolize the woman's strengthening with external support, not her own power. Besides, the evaluation of women in terms of their housework and happiness throughout the tale reflects an approach that reinforces gender roles and limits women's freedom. Such stereotypes are evidence that women are prevented from discovering their full potential.

Figure 2

Haunted Hand (Turkish tale)



In Figure 2, evaluated within the scope of the research, it was observed that the traits of being merciful is attributed to the man by using the description of “pitiful” and comparing his mood and personality traits with changing fades and having a mouth but not a tongue. Along with these mood traits, men are also honest buck, protecting, endure, and being patient. In Turkish fairy tale, with the description of the woman as a “fairy”, it was emphasized that she is lovely, cypress tall, has a cherub and is beautiful. With these traits, the woman is seen as intuitive, helpful, and ingenious on the other hand, and as meddlesome and clumsy. In addition to these traits attributed to the woman in the tale, she is given the duties of dowry and cleaning, marriage, and domesticity.

3.4. The interviews findings

Interviews with participants were recorded and transcribed by the researchers. Based on the codes and categories obtained as a result of the content analysis; “norms regarding gender in fairy tales, gender norms reflected in society, gender norms in educational institutions” themes were reached.

3.5. Norms regarding gender in fairy tales

In line with the participants' opinions, the gender norms in the fairy tales they listened to in childhood are under the theme of roles attributed to gender in fairy tales; that are grouped into 3 categories: 'women's role', 'man's role' and 'management/lifestyle'. These are given in Table 3.

Table 3

Norms Regarding Gender in Fairy Tales

Theme	Category	Codes
Norms Regarding Gender in Fairy Tales	Women's role	Fair Clever Executive
	Man's role	Strong They have strong intuition
	Management/Lifestyle	Equal participation of women and men in management Impact of nomadic lifestyle

Kyrgyz tale "The old woman and her seven sons", the emphasis that men are active and, strong and the female heroes take on a role that helps or supports them is also reflected in the participants' statements.

K2: In our tales, there are no situations where women are weak and waiting to be rescued and men are strong because, according to our traditions from the past, the understanding that men and women are on an equal level prevails.

K1: Tales are told in which justice is manifested, a girl or a shepherd from the people comes and replaces the Khan, justice comes first.

K1: There was no tradition of storytelling in my family. I stepped into the world of fairy tales in primary school. My favorite fairy tale is "Together We Are Stronger". A fairy tale in which the girl is very smart. The power of women is also reflected in the legends of Kyrgyz history. The protagonist of the Manas epic is a woman. The female mind and the existence of women are constantly shown.

T1: Now there is a proverb among Kyrgyz people. "Kızgın kır çaçı ulu". What does this mean? He actually talks about the value of the girl. They express that the girl's mind is also valuable, and she is also valuable. There are tales about this. She's a smart long-haired girl.

3.6. Gender norms reflected in society

In fairy tales, it was seen that marriage comes to the fore in social life. It was understood that the happiness and value of women are related to the fulfillment of the duties assigned to them at home. However, although the emphasis on equality between men and women in Kyrgyz society is seen in the statements of the participants, there are also statements in the press that violence against women has increased in recent years.

According to the opinions of the participants, it was seen that the roles of men and women in social and domestic life are emphasized under this theme, which consists of 4 categories: "family structure and marriage", "career choice", "faith and management", "violence and freedom of the press". The data, obtained from the interviews, are shown in Table 4 and the statements of the participants are included in quotations.

Table 4

Reflection of Gender Norms on Society in Kyrgyzstan and Türkiye

Theme	Category	Codes
Gender norms reflected in society	Family Structure and Marriage	Valuing women Equality in household chores Pressure to marry Restrictions on women after marriage Inequality in childcare
	Career choice	The effect of gender on career choice
	Faith/Management	Equality between men and women in management
	Violence/Freedom of the Press	The impact of belief in management

K2: Since we are an Eastern society or because some of our traditions have become corrupted, restrictions are placed on personal freedom compared to before marriage, such as women should stay at home after marriage.

T1: In a Kyrgyz house, there is a place where the eldest person sits. Little ones cannot sit. Age is important, not gender. Whoever is older sits down. If the woman is older, she sits. They are very protective of their traditions.

K2: I have never seen discrimination between men and women during a recruitment process. We see that women take part in all professions. We see that women work in the army, police forces and other state institutions where men work.

K1: While Kyrgyzstan was under the rule of the Soviet Union for 70 years, there was atheism. We can see more religious influence in Türkiye. There is no gender discrimination in professions in Kyrgyzstan. There is no such thing as a male profession. The situation is changing in Türkiye now, but in the past, some professions were generally preferred by men.

K1: Currently, violence against women is increasing in Kyrgyzstan. Since there is freedom of the press, these issues also reach outside Kyrgyzstan. Violence against women is widely reported in the press when there is a death.

T2: They care about their women. For example, if a man is sitting and a woman is standing on a bus, ones will definitely get up and give her a seat without asking anything. This could even be true even if the woman standing is a young girl her age or younger.

3.7. Gender norms in educational institutions

It was seen that there are differences between the two societies in the reflection of gender stereotypes in education. This difference is attributed by the participants to the fact that Kyrgyzstan remained under the Soviet regime for many years. In addition, the fact that women are at the forefront in Kyrgyz epics is also reflected in social life from a cultural perspective.

According to the opinions of the participants, a theme was determined over 3 categories are given in Table 5. In the manager selection category, it was stated that in Kyrgyzstan, managers are equally distributed between men and women, while in Türkiye, men are dominant. In the class arrangement category, it was stated that girls and boys sit side by side and the distribution of responsibilities in the classroom is equal. In the field of teachers in Kyrgyz, there is no difference in branches according to

gender, in Turks, women in social and human sciences; It was emphasized that men are dominant in the field of science.

Table 5

Gender Norms in Educational Institutions

Theme	Category	Codes
Gender Norms in Educational Institutions	Manager selection	Female-male ratio in management
	Class arrangement	Settlement of girls and boys
		Distribution of in-class responsibilities
	Branch of Teachers	Differentiation of branch according to gender

K1: I studied at the Turkish-Kyrgyz high school in Kyrgyzstan. We had both Kyrgyz and Turkish manager. The Kyrgyz manager changed twice, both women. The Turkish manager changed 4 times and all four were men. Our female teachers were teaching social-humanities courses. Men were always taking courses such as physics, chemistry, engineering and informatics.

K2: I can say that there is a social perception in society that girls are more organized and can take responsibility at an early age. That's why a girl and a boy were seated in the same row.

T1: In Kyrgyzstan, our department head is already a woman. Generally speaking, when we look at our other departments, there are men and women. Hence equalizing in number. I studied in primary and high schools in Türkiye. Of course, our administrators in those primary and high schools were men. However, what we observe now is that we can see that there are many female managers.

4. Conclusion and Discussion

Fairy tales are a part of cultural heritage and are an instructive or entertaining literary genre that usually contains fantastic or imaginary elements and enables the transfer of social structure between generations. Fairy tales are living structures because they are transferred from generation to generation, develop, continue to exist from past to present, and transmit their content in different time periods (Bür, 2019). Thus, the type of fairy tales that suit children's mindset and attract their attention are used for educational purposes to convey the expectations of society to younger generations.

This study was carried out to determine the gender norms contained in Turkish and Kyrgyz fairy tales and how they are transferred to social life. The Kyrgyz tale "The Seven Sons of the Old Woman" and the Turkish tale "The Haunted Hand" were examined by researchers and the gender norms they contained were determined. Individual interviews were held with 2 Kyrgyz and 2 Turkish participants to determine how these norms are reflected in social life. The gender norms, attributed to heroes and heroines in fairy tales, were evaluated under the headings of 'moods and personality traits', 'physical characteristics', 'attributed actions'.

In Turkish fairy tales, women are described as 'fairy', on the one hand, the characteristics of being lovely, meddlesorce, diligent and helpful are defined, on the other hand, they are stated as incompetence traits. It was observed that women were distinguished by their physical beauty, as well as being married and cleaning the house. Ölçer (2003) stated that especially the married woman must keep her husband in order to ensure family integrity and continuity, and explains that in this way, the continuity of the gender role is ensured by transferring it to the daughter. By using descriptions such as “a man with a mouth but no tongue, a man like a lamb”, men are assigned the characteristics of being quiet, calm, and compassionate, the act of putting up with women and the duty of providing for the household. These

characteristics attributed to men might stem from the necessity of the household to institutionalize a family under the umbrella of "one man" and "marriage", legitimized by society. As a result, it was observed that the characteristics attributed to men and women in Turkish fairy tales include some gender norms. This result was also supported by the findings obtained from the interviews.

A Turkish participant (T2): "As in every society, there are stereotyped thoughts on this subject. For example, in the old times of our country Women should know how to do housework, clean, and cook in order to get married". This statement supports that the idea having a place in society is also present in the fairy tale. Arsoy (2011), in her study examining women's gender roles and male domination in Turkish tales, stated that women have lived under men's domination for a long time. Gender norms imposed on women in society, such as giving birth to a son, having certain physical characteristics and honor, are expressed in fairy tales as elements that strengthen male dominance. Dökmen (2010), defined the concept of gender as the meanings and expectations imposed by society and culture on men and women. When the Turkish fairy tale and the opinions of the participants were examined, it was seen that the gender norms in the fairy tale were also transferred to social life. The other Turkish participant (T1): “When we say gender equality, we generally perceive it as the roles of men and women. Of course, we see a father role and a mother role in Türkiye”. The statement “We can see that this is reflected in fairy tales in the same way” supports this finding. The roles assigned to men and women by society have also been found in fairy tales, which are an element of culture and play an important role in the transmission of these roles. In fairy tales, the patriarchal structure of society is preserved by producing extraordinary content with unconscious narratives in order to control the behavior of individuals. In this way, the cultural structure of the society is transferred between generations (Bür, 2019).

It was determined that in the examined Turkish fairy tale, the norms attributed to men and women and the patriarchal structure were transferred to social life. Karaarslan (2019), in her research examining women in the context of gender in Turkish fairy tales, stated that women stand out with their beauty in fairy tales, that they are self-sacrificing and weak, that they dream of marrying a saviorman. The home is safer for women, that is, it was revealed that they meet the norms of the patriarchal social structure. She stated that men are depicted as strong and successful, thus reflecting society's gender norms.

The real heroes of Kyrgyz tales are people encountered in daily life such as smart people, old people, orphans, women, poor and orphaned children, and farmers. Rich people, khans, sultans, even half-witted people, and naive people are among the heroes of such tales. Fairy tales generally include the social relations of the poor and the rich. Some opposites such as good and evil and the struggles of the heroes are described. The evil done by the rich to the poor is condemned. In Kyrgyz tales, 'Han' is the most common fairy tale hero (Doğan, 2009). It is possible to see similar heroes and themes in the examples of Turkish tales in Bağcı's (2011) study. As a result, in the Kyrgyz tale, men are attributed the characteristics of being strong, skillful, productive, helpful and wise, with the descriptions of 'Bahadir' and 'Azrael'. By describing women as 'a unique daughter', it was emphasized that they have a valuable position in society.

Bayrak İşcanoğlu (2018) stated that women have always been valued in family and social life in Turkish culture. When we look at Turkish cultural history, she stated that women have a say in management and that women are cared for. She said that Kyrgyz women have various roles in Kyrgyz social and cultural life, and that Kyrgyz women have various duties towards their children as mothers, towards their life partners as wives, and towards other family members as family elders. Tekin (2010), pointing out that many archaeological excavations, indicate the existence of a pre-patriarchal matriarchal period, resonates with the statement by the Kyrgyz participant (K2): “In our tales, there are no situations where women are weak and waiting to be rescued and men are strong. Because, according to our traditions from the past, the understanding that men and women are on an equal level prevails.” It was seen that this value given to women in Kyrgyz culture is also internalized by men in society. Similarly, the other

Kyrgyz participant (K1) emphasized the value of women with the statement: “Tales are told where a girl or a shepherd from among the people comes and replaces the Khan and justice comes first”. On the other hand, Turkish participant (T1) in Kyrgyzstan stated that, age is important, not gender. In the living room of the house, the oldest person sits at the head. Older women also have the option to sit there. The statement 'No small child can come and sit' supports the existence of gender equality in social life.

After the October Revolution of 1917, the Soviet Union expanded its sphere of influence to the Central Asian region, including Kyrgyzstan, and showed its influence on Kyrgyz social life, especially in the field of education. This situation led to the change of Kyrgyzstan's linguistic and cultural identity under Soviet influence. The old education systems of the countries under the umbrella of the USSR began to be replaced by the communist education system, which does not contain theological elements and is organized according to socialist philosophy (Gül, 2021). Russian is accepted as the official language and is taught as the main language in schools. The use of the Kyrgyz language was restricted and accordingly, a Russian-speaking generation grew up in Kyrgyzstan. The migration of the Russian population after independence should not be interpreted as the decline or withdrawal of the Russian language. That’s why Russian is the official language in this Republic, an important language of education and training, a second language and the common language of communication between peoples. While there are intellectuals, who think that the status of Russian in Kyrgyzstan, prevent the development of Kyrgyz Turkish, there are also intellectuals who are not disturbed by this (Aydın, 2019).

This situation is similar to the Kyrgyz participant (K2): “The positive side of the Soviet regime was the provision of equality in education between men and women. There were no obstacles. Girls and boys had to go to primary school, secondary school, and high school. Then, if they wanted to continue, they could prepare for an exam, get a place in a faculty with a certain score and continue their education. Afterwards, he could start his business life. In this case, we can state that there is no gender discrimination at all”. Another Kyrgyz participant (K1): “After the independence process, in 2010, under the influence of political events in Kyrgyzstan, the country elected a woman as its president. We can say that this is a very difficult situation that we cannot imagine happening in regions like ours, which are considered patriarchal societies. This president was temporary. The people were quite satisfied. We also see male presidents sitting in their seats and not getting up for years. But our female president held the presidential elections that we can call the cleanest and most fair in the history of independence. The influence of the Soviet regime was also seen in the statement 'As Kyrgyz citizens, we are very grateful for the work they did at that time”.

All these views may be an indication that it can be assumed that the value given to women in Kyrgyz tales, reflected in Kyrgyz social life as equality between men and women, is related to the country being under the influence of the Soviet regime for many years. Because the state's policy of raising a Russian-speaking "homo sovieticus" type of human being and the attempt to shape society and the individual around this goal (Roy, 2009) has become possible by using oral literary works, which are the most important sources that determine cultural identity, as tools (Temur, 2009). The Soviet Union focused on how to benefit from folklore rather than attaching importance to its scientific development, thus folklore was considered as a tool for the cultural structuring of the people, political education, and the realization of socialism (Oinas, 1975). Hence, works, belonging to the oral culture tradition, such as epics, fairy tales, folk songs, and proverbs, were recreated in the process of creating a socialist society that was at peace with socialist values and aimed by the system, and Soviet folklore, whose content was equipped with ideological messages, was created (Panchenko, 2007). All these works were integrated into the education system and influenced the students. The Turkish participant explained this situation (T1): “Before the Soviet Union, the oral folk literature of the Kyrgyz people, called utterance tales, could emerge. Before the Soviet period, Kyrgyz fairy tales existed orally but not in writing. Since Russian culture is dominant, children grow up with Russian classics and fairy tales. After the Soviet period, fairy

tales were gradually translated into Kyrgyz language. This is how it starts to develop. Because Russian culture is constantly taught in schools", he explained.

Kuehnast (1997), in her study of gender and generation dilemmas in post-Soviet Kyrgyzstan, emphasized the Sovietization effect on a group of women during the independence process of Kyrgyzstan. In the study, it was stated that although Sovietization was largely adopted by Kyrgyz women, they also continued Kyrgyz traditions simultaneously throughout this century. It was stated that women did not differentiate between Soviet or Kyrgyz ideologies, that a Soviet-Kyrgyz identity emerged by shaping each other, and that Sovietization gave Kyrgyz women a tool to oppose some oppressive familial expectations towards them. On the other hand, Deyoung (2007) stated that mass education was considered important during the Soviet period and that Soviet values and teachings conflicted with nomadic and/or Islamic values and traditions. In this context, he stated that schools are called upon to focus on children ideals such as gender equality, atheism, dedication, the necessity of scientific and professional specialization, and belief in a future world. Kyrgyz participant (K1) said, "When Kyrgyzstan was under the rule of the Soviet Union for 70 years, there was a kind of atheism. An issue of religion intervenes at this point. We can see more religious influence in Türkiye." The statement 'There is no distinction between professions in Kyrgyzstan, it is not generally seen that men go to engineering" supports this situation.

Accordingly, the fact that the Kyrgyz people were under Soviet rule for many years might be the reason why there is no gender discrimination in social life, especially in education and work. Turkish participant living in Kyrgyzstan (T1): "There are a lot of female students who go abroad, especially for Erasmus and Orhun exchange programs. You know, the family doesn't say, you're a girl, where are you going? Just sit down, finish school and get married. They go, especially girls, to Germany to study every summer. This is an indication of their self-confidence and lack of discrimination based on gender" It was stated in their statements that the education and working lives of female students were especially supported.

When gender norms in educational institutions in Türkiye and Kyrgyzstan are considered, it could be asserted that in the opinion of the participants, men are dominant in school administration in Türkiye. It was stated that men and women are equally distributed in school administration in Kyrgyzstan. In the branch distribution of teachers in Türkiye, women are in social and human sciences; while men stand out in science, it was stated that there was no difference according to gender in Kyrgyzstan. Kyrgyz participant (K1): "I studied high school in Kyrgyzstan at the Turkish-Kyrgyz high school. We had both Kyrgyz and Turkish administration. The Kyrgyz manager changed twice, both women. The Turkish manager changed 4 times and all four were men. Our female teachers were teaching social-humanities courses. This situation is clearly seen in the statement "Always men were taking courses such as physics, chemistry, engineering and informatics", Turkish participant (T1) said, "Our department head at the university is already a woman. Generally speaking, when we look at our other departments, there are men and women." In his statement, "We are equal in number", he emphasized the existence of female administrators at the university where he worked in Kyrgyzstan and their equal distribution with men. This situation is compatible with the personality traits and physical characteristics attributed to men and women in fairy tales. In Turkish tales, women are weak and the person waiting for the man in the home environment; attributing strong and savior leadership to men coincide with the dominance of men in management in social life.

Koyuncu Şahin and Çoban (2019), stated that the majority of administrators working in the central organization of the Ministry of National Education and/or as permanent staff and academicians in administrative positions at universities in Türkiye are men, and female administrators remain in the background. The fact that women have a more passive role according to the cultural gender norms,

conveyed through fairy tales might cause women to accept the dominance of men in managerial positions in social life.

As a result, it was supported by the interviews that the gender roles revealed in the analysis of the fairy tales also exist in social life and educational institutions. Although both societies derive from Turkish culture, it was observed that the management style and belief factors that differ from past to present affect gender roles both in fairy tales and in social life. According to this result, it should not be ignored that when using fairy tales as an educational tool, gender roles are transferred to children and therefore to society. Fairy tales are of great importance in transferring cultural elements from generation to generation, but the world is changing and developing rapidly. Therefore, while the transfer of cultural elements to children continues, arrangements should be made in accordance with the requirements of the age. The content of fairy tales should be adapted to contemporary life in a way to include cultural characteristics in order to support gender equality and convey them correctly to children.

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Research Article

The Role of Metaverse Technology in Education: A Systematic Review of Opportunities, Challenges, and Educational Potential

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Abstract: This study investigates the application of the metaverse in educational settings, focusing on its development, implementation, and impact on learning outcomes. Employing a systematic literature review methodology, the research meticulously followed the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines to ensure a comprehensive and unbiased collection of data. Searches were conducted on major databases including Web of Science and Scopus, covering literature from January 2007 to June 2023. Consequently, a comprehensive bibliometric review was executed, harnessing the repositories of Web of Science (WoS) and Scopus. In pursuit of a comprehensive educational objective, the approach eschewed the imposition of restrictions pertaining to time frames, pedagogical stratification, or subject-specific criteria. Given the novelty of the metaverse topic and considering the inclusionary and exclusionary parameters, a compilation of 17 scholarly pieces was critically evaluated. The results elucidate the metaverse's intrinsic capacity to augment and revolutionize pedagogy, fostering elevated educational yields and bolstering student involvement and enthusiasm. The study categorizes the primary aims of metaverse applications in education, which include the development of virtual worlds, creation of specific educational tools such as avatars and virtual labs, and pedagogical innovations tailored for immersive environments. Key findings suggest that the educational metaverse fosters significant improvements in student engagement and collaboration, enhances digital proficiency, and supports diverse pedagogical approaches. Despite these advantages, challenges related to technological integration, accessibility, and the scalability of findings due to small sample sizes were identified. The study underscores the need for future research to expand on methodological diversity and larger participant groups to validate and generalize the results across different educational contexts. This research contributes to the academic discourse by providing a detailed overview of the current state of metaverse utilization in education, highlighting both its potential and limitations. The findings aim to guide future studies and inform educational practices and policy-making in integrating virtual reality technologies.

Keywords: Metaverse in Education, Systematic Literature Review, Virtual Learning Environments (VLES), Educational Technology Integration, Pedagogical Innovation

1. Introduction

The term "metaverse" is derived from the words "meta" (beyond) and "universe," and is defined as a virtual universe (Mystakidis, 2022). The metaverse extends beyond commerce and entertainment, facilitating the formation of virtual communities. It represents a next-generation internet, encompassing a three-dimensional virtual space where users interact through avatars, described as a significant digital explosion in cyberspace (Ko, Chung, Kim & Shin, 2021; Lee, 2021; Seok, 2021). Mark Zuckerberg, founder of Facebook, defines the metaverse not merely as a platform for viewing content, but as a tangible internet where we live our lives, aimed at enhancing the time spent on screens (Zuckerberg, 2021). According to Mystakidis (2022), the metaverse is described as a surreal universe that merges physical reality with digital virtuality, characterized by its continuity, permanence, and multi-user environment. Sriram (2022) views it as a transition from the real world to a virtual one. Zhao, Zhang, Zhu, Lan, and Hua (2022) describe it as a super virtual reality ecosystem based on the internet, composed of interdisciplinary technologies such as augmented reality, virtual reality, mixed reality, and artificial intelligence. The metaverse is known for utilizing augmented and virtual reality glasses in its application (Guo & Gao, 2022). It is recognized as an advanced stage of the virtual universe (Kye, Han, Kim, Park, Jo & Huh, 2021).

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The outbreak of the COVID-19 pandemic has profoundly impacted every facet of our daily lives. This circumstance underscored the importance of assimilating Information communication technologies (ICT) and digital tools into the educational realm (Daniel, 2020). Educational technology, encompassing the fusion of computerized assets and pedagogical principles to empower tech-enhanced learning, is witnessing increased prominence (Colomo-Magaña et al., 2021; Hew et al., 2019; Januszewski & Molenda, 2013). Furthermore, as today's learners navigate a globally diverse digital landscape with access to tailored, fluid information, their perceptions of efficacious learning and instructional necessities evolve (Anastasiadis et al., 2018). Hence, there's a burgeoning demand among students for richer, stimulating, and immersive learning journeys where they're proactive contributors, not just passive observers (López-Belmonte et al., 2021). This underscores the imperative of understanding how innovative, learner-centric tech-empowered learning avenues can reshape educational dynamics.

Learning is most effective when it engages with student inquiry, enhances 21st-century competencies, addresses societal challenges, and integrates information and communication technology, as demonstrated by Barab and Dede (2007) and Zeidler et al. (2005). Learners, particularly those fluent with technology, are invigorated by digital assets, as discussed by Baynat and López (2020). The use of advanced technological pedagogies in learner-centered approaches can enrich the educational experience, according to Billingsley et al. (2019). The accelerated adoption of digital tools and the evolution of technologies within pedagogical frameworks, as detailed by Zawacki-Richter and Latchem (2018), are rendering traditional teaching methods obsolete, thereby facilitating the emergence of sophisticated educational strategies and innovative instructional methodologies, as identified by Hughes et al. (2006).

The educational sector exhibits growing enthusiasm for immersive virtual learning environments (VLEs) to craft tailored, captivating learning encounters (Reisoğlu et al., 2017). In such realms, accentuated by Extended Reality (XR) tech, learners can engage with virtual entities and glean practical insights (Lampropoulos et al., 2021). VLEs represent a synthesis of digital and tangible spaces, fostering educational exchanges through a blend of diverse technologies and pedagogical methods (Dillenbourg et al., 2002). They complement both online and conventional classrooms, empowering learners to actively co-create their educational journeys. VLEs also play a pivotal role in nurturing virtual educational communities, fostering camaraderie, enhancing learners' analytical skills, and facilitating access to interactive resources (Pan et al., 2006). In this VLE milieu, the metaverse's adoption is rising, heralded for its potential dividends. It's a digital, three-dimensional universe facilitating real-time interactions among users and between users and digital entities, blurring the boundaries of time and space. Within the metaverse, tangible and virtual realities converge, with user interactions mediated by virtual avatars, underscoring the confluence of online and offline identities (Park & Kim, 2021; Sparkes, 2021). The metaverse offers a lifelike, immersive digital milieu anchored in principles of persistence, interactivity, and embodiment, promoting social interactions and cultural exchanges (Falchuk et al., 2018; Park et al., 2021). Given its intrinsic features, the metaverse's integration in educational contexts is gaining traction. In these immersive domains, gamified elements augment learning experiences, boosting creativity, collective intelligence, and memory retention (Díaz et al., 2020; Márquez, 2010). The metaverse, when approached with a student-centric lens, can enhance analytical abilities, amplify academic achievements, and facilitate in-depth subject comprehension, culminating in superior learning environments (Tarouco et al., 2013).

1.1. Justification and research objective

The transition towards technologically enhanced education has been significantly expedited by the disruptions caused by the COVID-19 pandemic. This shift has underscored the importance of digital platforms like the metaverse—an interactive, three-dimensional digital universe that supports real-time interactions among users and between users and digital entities. The metaverse blurs the

boundaries between virtual and physical realities, offering a novel context for redefining educational strategies (Moreno-Guerrero et al., 2021; Pozo-Sánchez et al., 2021).

The potential of the metaverse to provide immersive, gamified, and highly interactive learning experiences positions it at the forefront of educational technology research. With its unique capabilities to simulate real-world interactions in a controlled, virtual setting, the metaverse holds promise for transforming educational practices, enhancing learner engagement, and facilitating deeper understanding of complex subjects (Lee, 2021; López-Belmonte et al., 2022).

Given these dynamics, this study aims to conduct a comprehensive bibliometric analysis of the literature on the educational use of the metaverse. By categorizing existing studies, identifying dominant themes, and pinpointing gaps, this research will not only provide a clear snapshot of the current landscape but also set the stage for future investigations that can build on these findings. This approach will help establish a theoretical framework for the application of the metaverse in educational contexts, aiming to contribute substantially to the field by informing both academic research and practical application (Zhao et al., 2021).

The primary goal of this study is to conduct a comprehensive analysis of existing research on the educational metaverse, establishing its theoretical foundations and delineating its current relevance and implications for the academic community. This exploration aims to pave the way for future research, building upon well-established findings. To guide our inquiry and ensure it aligns with the overarching objectives, we have formulated several specific research questions. Each question is designed to uncover distinct aspects of the educational metaverse that are critical for understanding its development and impact. These questions are developed based on a review of the literature and consultations with subject matter experts (Tlili et al., 2022):

RQ1: Which countries have led the way in generating content on the educational metaverse? This question aims to identify geographical leaders in metaverse content creation, providing insights into regional advancements and potential biases in technology deployment.

RQ2: What stand out as the primary objectives in literature concerning the educational metaverse? Exploring the primary objectives highlighted in the literature will help clarify the main aims pursued by researchers and educators, aligning future studies with these goals.

RQ3: Which methodologies dominate the research landscape of the educational metaverse? Identifying dominant methodologies will inform us about the robustness and diversity of research approaches, guiding methodological choices in subsequent studies.

RQ4: What participant demographics are commonly represented in educational metaverse studies? Understanding who is being studied will reveal inclusivity and the scope of the research, ensuring that future initiatives can address any demographic gaps.

RQ5: What are the recurrent variables under scrutiny in educational metaverse research? This question seeks to catalog the variables frequently analyzed, helping to establish a core set of factors for ongoing and future investigations.

RQ6: What tools or instruments have been prominently employed in the study of the educational metaverse? Detailing the tools and instruments used allows for an assessment of the technological and methodological standards in the field, facilitating the adoption of effective practices.

RQ7: What insights or conclusions frequently emerge from research on the educational metaverse? This question will compile prevalent findings and conclusions, contributing to a cumulative knowledge base that supports evidence-based decision-making in educational technology.

2. Method

2.1. Research design

To achieve our objectives and address the research questions outlined, we conducted a systematic literature review guided by the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) standards (Page et al., 2021). Additionally, we implemented an "analytical framework," which is a structured set of criteria used to assess and interpret the impact of studies systematically. This framework, based on methodologies described by Rodríguez-García et al. (2020) and Soler-Costa et al. (2021), helps us categorize and analyze findings from the literature in a methodical way, enhancing the rigor and reliability of our conclusions.

For our literary exploration, we tapped into the Web of Science (WoS) and Scopus databases, both globally recognized for their repository of impactful and scientifically significant publications (Aksnes & Sivertsen, 2019). Our choice also aligns with expert recommendations who have underscored the significance of WoS and Scopus for such studies (Zhao et al., 2021). A critical factor influencing our database selection is their widespread acknowledgment for aggregating impactful works in the realm of educational technology (Lampropoulos et al., 2022; Mystakidis et al., 2022), directly mirroring our study's focal point.

In our investigation, the core variables we deemed essential for document analysis include: country of origin, underlying objectives, employed methodology, research sample, variables chosen by the investigators, utilized instruments, and salient findings related to the educational metaverse.

2.2. Procedure

Our investigative journey started in January 2022, aiming to encompass all preceding scholarly works. Our inaugural step was crafting a precise search equation, tailoring it to the contemporary state of the art. With a well-defined scope, the singular term "metaverse" sufficed as our search criterion in the TOPIC metadata, namely title, abstract, and keywords. We confined our search to WoS's educational domains, such as Education, Educational Research, and Education Scientific Disciplines, and also to Scopus's social sciences sphere. The objective was a comprehensive view of the metaverse's role in education, embracing every educational phase and all knowledge domains interlinked with education.

The data collection phase for our study was executed by scanning the Web of Science (WoS) and SCOPUS international databases on June 30, 2023, encompassing publications from January 2007 to June 2023. The choice of these databases stems from their widespread recognition and usage within the international scientific community, as well as their relevance for academic promotions. We selected the period starting from 2007 because it marks significant developments in digital and virtual technologies that underpin the evolution of the Metaverse. Notably, this timeframe includes critical advancements in Internet speed, graphics technology, and the launch of influential platforms that have shaped the trajectory of Metaverse technologies. The search criteria for the included studies were established following the PRISMA (2020) guidelines, focusing on titles and abstracts containing various combinations of "metaverse" and "education" in the advanced search settings. Only documents classified as "articles" were considered. We have detailed the criteria for document inclusion and exclusion in Table 1.

Table 1

Inclusion and Exclusion Parameters

Inclusion Criteria	Exclusion Criteria
Documents spotlighting metaverse in education.	Inaccessible documents. Improperly indexed documents. Redundant documents. Documents lacking a majority of the variables examined in this study.

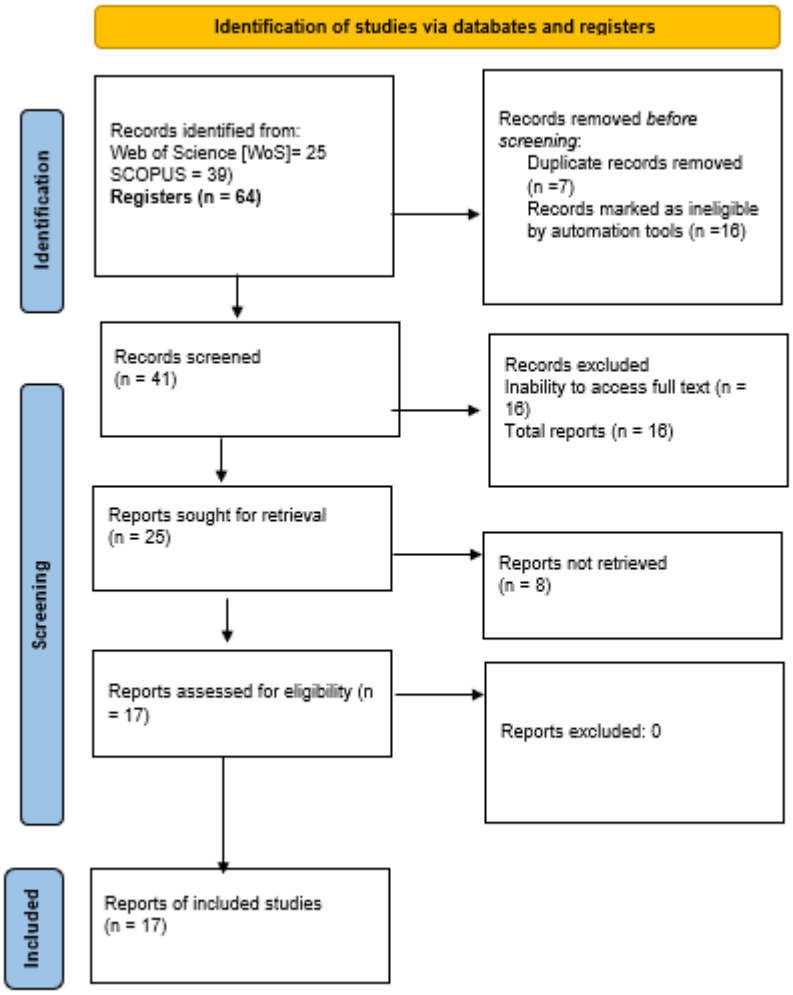
Our initial search on the Web of Science (WoS) and Scopus databases yielded 64 scholarly articles, comprising 25 from WoS and 39 from Scopus. The search was meticulously designed using combinations of the terms "metaverse" and "education." These included phrases like "metaverse AND education," "educational metaverse," and "metaverse in learning environments," searched within the titles and abstracts to ensure relevance and specificity.

Following the PRISMA systematic review protocol, we refined our collection based on predefined inclusion and exclusion criteria. Articles that were inaccessible, improperly indexed, redundant, or lacked significant research variables were excluded. This refinement process resulted in 22 articles from WoS and 35 from Scopus being initially considered. After further exclusions for suboptimal indexing, duplicates, and lack of necessary variables, our final analytical base consisted of 17 well-indexed and pertinent publications.

For transparency and further details, the complete dataset including the search terms, strategies, and selected studies can be accessed via this hypothetical link: View Dataset ((https://docs.google.com/spreadsheets/d/1VHuW5jySFnKmeib8x4ZCdT0f9wb4TlDAEI5v0ev3Rgg/edit?usp=sharing).

Figure 1

A Schematic Representation Based on the PRISMA Protocol



Upon reviewing these articles, we applied our inclusion and exclusion criteria as follows:

1. Accessibility Check: Articles that were not accessible were excluded, resulting in the exclusion of 3 articles from WoS and 4 from Scopus.
2. Indexing Check: We removed articles with improper indexing or those not appearing prominently in the databases, which accounted for the exclusion of 5 from WoS and 11 from Scopus.
3. Redundancy Check: We identified and removed 11 duplicate articles between the databases.
4. Variable Relevance Check: Articles lacking in a majority of the specified research variables were also excluded, amounting to 7 from WoS and 12 from Scopus.

After these exclusions, we were left with a distilled group of 17 well-indexed and relevant publications which form the analytical base for our study.

3. Results

The findings from the study's variable analysis are segmented into different subsections to ensure clarity and ease of interpretation.

3.1. Country

When examining the primary contributors to the realm of educational metaverse research (RQ1), both Brazil and Spain emerge prominently, accounting for 29.4% each. Brazil's pioneering efforts are showcased through five distinct contributions (Arcila, 2014; Díaz et al., 2020; García, 2011a; Reyes, 2020; Tarouco et al., 2013). Spain's involvement is equally robust with five studies (Baynat & López, 2020; Díaz et al., 2020; Garrido-Íñigo & Rodríguez-Moreno, 2013; Hadjistassou, 2016; Reyes, 2020). After these frontrunners, Mexico (Nurhidayah et al., 2020; Park et al., 2021) and Colombia (García, 2011b; Vaca Barahona et al., 2016) are both represented with two scholarly pieces each.

Table 2 presents the primary countries contributing to educational metaverse research, along with the number of contributions from each country.

Table 2

Contributions to Educational Metaverse Research by Country

Country	Number of Contributions	Contributing Studies
Brazil	5	Arcila (2014); Díaz et al. (2020); García (2011a); Reyes (2020); Tarouco et al. (2013)
Spain	5	Baynat & López (2020); Díaz et al. (2020); Garrido-Íñigo & Rodríguez-Moreno (2013); Hadjistassou (2016); Reyes (2020)
Mexico	2	Nurhidayah et al. (2020); Park et al. (2021)
Colombia	2	García (2011b); Vaca Barahona et al. (2016)

Table 2 highlights that Brazil and Spain are the leading contributors to educational metaverse research, each accounting for 29.4% of the total contributions. These countries are followed by Mexico and Colombia, each with two scholarly contributions.

3.2. Aims

In addressing the primary objectives observed in metaverse education-related documents (RQ2), there's a notable diversity in focus. Some studies dive into the intricacies, potential pitfalls, and challenges encountered during the creation, deployment, and operational phases of virtual educational spaces (Díaz et al., 2020). In contrast, others pivot towards constructing specific tools and assets within the virtual realm. This includes the formulation of avatars (Schlemmer et al., 2009), creation of virtual labs (Clark, 2012; Schaf et al., 2012; Tarouco et al., 2013), development of unique platforms (García, 2011b), 3D environment prototypes (Arcila, 2014), and pedagogical techniques tailored for the metaverse (Díaz et al., 2020).

As illustrated in Table 3, a summary is provided of the number of scholarly articles focusing on various research objectives within the domain of metaverse education. The table categorizes these articles by their primary focus, which spans from the development and implementation of virtual worlds in educational environments to the impact of the metaverse on students. This distribution offers insights into the focal points and prevailing trends in metaverse-related educational research.

Table 3

Distribution of Research Objectives in Metaverse Education Studies

Research Objectives	Number of Papers
Developing and implementing virtual worlds in educational environments	7
Development of concrete and specific resources, such as avatars	6
Virtual laboratories	5
Prototypes of 3D environments	4
Platforms	3
Pedagogical methods	2
Impact of the metaverse on students	1

Table 3 presents a quantitative overview of scholarly articles classified by their research objectives within the field of metaverse education. The table enumerates articles that range in focus from the development and implementation of virtual worlds within educational settings to the examination of the metaverse's impact on students. The numbers indicate the quantity of articles dedicated to each specific objective, offering an insight into the areas that are currently receiving the most attention in academic research. It is a representation of the relative emphasis placed on each area within the corpus of collected literature.

3.3. Research approach

When assessing the research methodologies used in the educational metaverse studies (RQ3), it emerges that case studies dominate. The research techniques have been either quantitative (Arcila, 2014), qualitative (Vaca Barahona et al., 2016), or mixed-methods (Díaz et al., 2020). An extensive list of the methodologies is presented in this paper's appendix.

Table 4 presents an overview of the research methodologies used in educational metaverse studies, highlighting the dominance of case studies and the diversity of research techniques employed.

Table 4

Research Methodologies in Educational Metaverse Studies

Methodology	Study	Type of Research
Case Study	Arcila (2014)	Quantitative
Case Study	Vaca Barahona et al. (2016)	Qualitative
Case Study	Díaz et al. (2020)	Mixed-Methods

Table 4 shows the prevalence of case studies in educational metaverse research. The methodologies encompass quantitative, qualitative, and mixed-methods approaches.

3.4. Study participants

In examining the sample size in the educational metaverse research (RQ4), most studies involved less than 100 participants, accounting for 41.1% of the 17 reviewed studies. A mere 11.7% of the studies had samples greater than 100 students, and in 29.4%, the sample size wasn't specified (Table 5).

Table 5

Distribution of Sample Sizes in Educational Metaverse Research

Sample Size	Percentage of Studies	Number of Studies
Less than 100 participants	41.1%	7
Greater than 100 participants	11.7%	2
Not specified	29.4%	5

Table 5 summarizes the distribution of sample sizes in educational metaverse research studies, highlighting the prevalence of smaller sample sizes and the instances where sample sizes were not specified.

3.5. Key Variables

In answering which main variables are prevalent in educational metaverse studies (RQ5), many studies exhibit similar focuses. The majority center on learning outcomes derived from the metaverse's application. Emphasis is given to the ideas of presence and telepresence in virtual domains (Shlemmer et al., 2009), student performance outcomes (Nurhidayah et al., 2020), challenges in metaverse integration (Arcila, 2014), time allocations in metaverse activities (Clark, 2012), acceptance levels (Díaz et al., 2020), motivation (Park et al., 2021), and interactivity in the educational arena (Vaca Barahona et al., 2016) (Table 6).

Table 6

Key Variables in Educational Metaverse Studies

Key Variable	Study
Presence and Telepresence	Shlemmer et al. (2009)
Student Performance Outcomes	Nurhidayah et al. (2020)
Challenges in Integration	Arcila (2014)
Time Allocations	Clark (2012)
Acceptance Levels	Díaz et al. (2020)
Motivation	Park et al. (2021)
Interactivity	Vaca Barahona et al. (2016)

Table 6 identifies the key variables studied in educational metaverse research, highlighting the recurring themes and focuses of various studies.

3.6. Measurement instruments

In examining the kinds of instruments applied within the realm of the educational metaverse, ad hoc surveys stand out as the primary data collection tool (Arcila, 2014; Clark, 2012; Díaz et al., 2020, and others). Additionally, participant observations during different task applications within varied

experiments also play a critical role (García, 2011a; Garrido-Iñigo & Rodríguez-Moreno, 2013; Jaffurs, 2011) (Table 7).

Table 7

Measurement Instruments in Educational Metaverse Studies

Measurement Instrument	Study
Ad Hoc Surveys	Arcila (2014); Clark (2012); Díaz et al. (2020)
Participant Observations	García (2011a); Garrido-Iñigo & Rodríguez-Moreno (2013); Jaffurs (2011)

Table 7 summarizes the primary measurement instruments used in educational metaverse research, emphasizing the prominence of ad hoc surveys and participant observations.

3.7. Key outcomes

Delving into the significant discoveries in educational metaverse research, findings from multiple studies present some variations. While an appendix detailing these findings is included, a common thread in the studies is the examination of metaverse applications within educational processes. For instance, Abeles (2007) observed that integrating metaverse within educational approaches will foster innovation in both traditional and e-learning modalities. Further, multiple researchers, including Arcila (2014) and Schaf et al. (2012), found that the virtual space enhances active engagement, collaborative learning, and digital proficiency. Meanwhile, other studies noted benefits such as improved learning outcomes and enhanced subject comprehension (Table 8).

Table 8

Key Outcomes in Educational Metaverse Studies

Key Outcome	Study
Innovation in Educational Approaches	Abeles (2007)
Enhanced Active Engagement	Arcila (2014); Schaf et al. (2012)
Improved Collaborative Learning	Arcila (2014); Schaf et al. (2012)
Increased Digital Proficiency	Arcila (2014); Schaf et al. (2012)

Table 8 outlines the key outcomes observed in educational metaverse research, reflecting the positive impact of metaverse applications on educational processes and learning outcomes.

4. Discussion and Conclusions

Our examination of the academic literature confirms significant shifts in the educational landscape in recent times, as emphasized by sources like Jackman et al. (2021) and Moreno-Guerrero et al. (2021). Such shifts have been intensified due to the ramifications of the Covid-19 pandemic, leading to a transformation in traditional learning spaces (Daniel, 2020; Ratten & Jones, 2021). Contemporary learning environments, deeply rooted in virtual platforms and digital methodologies, have been crafted to ensure that pedagogical processes adhere to the principles of ubiquity (Schneider & Council, 2021). Within this digital and virtual shift, the concept of the metaverse gains distinct prominence (Díaz, 2020; Lee, 2021; Rospigliosi, 2022). The onset of these metaverse-driven digital realities, and their prospective integration into education, accentuates the importance of dissecting existing scholarly works in this domain.

Our assessment, rooted in articles from the WoS and Scopus databases and following the PRISMA protocol, unveiled several observations. Notably, there's a concentration of research emerging from Brazil and Spanish-speaking nations like Spain, Mexico, and Colombia. This reveals an evident gap in contributions from English-speaking and Asian countries, which historically dominate pioneering educational research. Such findings gain significance when juxtaposed against research indicating the United States' dominant role in the field (Abbate et al., 2022; Tas & Bolat, 2022; Tlili et al., 2022).

The studies in question predominantly utilize case study methods, with a minority employing quantitative, qualitative, or mixed methodologies. Most of these early endeavors draw from modest sample sizes and target university demographics. Tlili et al.'s (2022) insights align with our observations, suggesting the metaverse's novelty in academic circles. Instruments like tailored questionnaires (Arcila, 2014; Clark, 2012) and direct experiential observation (García, 2011a; Nurhidayah et al., 2020) form the core data collection tools.

Differing objectives emerge from our analysis. While some studies delve into the educational impacts of the metaverse (Abeles, 2007; Baynat & López, 2020), others are tailored towards metaverse-specific platforms and tools (Arcila, 2014; García, 2011b). This delineation showcases the broad potential for research, emphasizing a holistic and comprehensive examination of educational contexts.

In summing up, the metaverse's integration into education is in its nascent phase. While digital ecosystems and techno-pedagogical tools are becoming pervasive, there's a paucity of significant metaverse-centric educational endeavors. Hence, more expansive research, encompassing diverse methodologies and broader demographics, is imperative. However, one must approach these findings with circumspection due to the inherent constraints of systematic reviews. The subject is evolving, and research trends may shift in the upcoming years. Yet, the importance of a foundational review in a promising arena cannot be understated. Establishing a solid theoretical framework is essential for facilitating the metaverse's practical integration into educational settings.

The investigation into the educational metaverse has unveiled several core areas of focus that span across different countries and educational methodologies, revealing the depth and diversity of metaverse applications in education. The significant representation of countries like Brazil and Spain highlights a regional enthusiasm and commitment to exploring the potential of virtual environments in enhancing educational outcomes. These findings suggest a growing global interest in the metaverse as a transformative tool for educational practices.

Our analysis reveals a rich variety of aims within metaverse education research, ranging from the development of virtual tools and environments to pedagogical innovations tailored for digital realms. The diversity in objectives underscores the metaverse's capacity to support a wide array of educational activities, including the creation of immersive, interactive learning experiences that can cater to different educational needs and learning styles.

Despite the innovative approaches uncovered, the research methodologies predominantly employed were case studies, which, while insightful, limit the generalizability of the findings. The dominance of small sample sizes in these studies further restricts the ability to broadly apply these insights across diverse educational settings. Therefore, future research should consider incorporating larger, more diverse participant groups to enhance the validity and applicability of the results.

In terms of outcomes, the metaverse has demonstrated potential to significantly influence educational practices by fostering engagement, collaboration, and digital proficiency among students. These outcomes align with the emerging demands of modern education systems which seek to integrate technology more deeply into the learning process. However, the challenges of metaverse integration, such as technological accessibility, user adaptation, and the need for robust digital infrastructure, must be addressed to realize its full potential.

The discussion section has also highlighted a gap in the literature, particularly in the systematic review of existing studies. A more meticulous and comprehensive literature search and review would enrich the discussion by providing a more solid foundation for understanding the metaverse's current impact and future potential in education. This approach would also help in identifying and addressing any existing gaps in the research, thereby supporting more targeted and effective future studies.

In conclusion, while the metaverse holds promising prospects for revolutionizing educational methods and outcomes, a concerted effort to understand and mitigate its challenges is essential. The future of metaverse research in education should focus on expanding the scope of studies to include more diverse methodologies and larger participant samples, enhancing the literature base with comprehensive reviews, and developing frameworks that address both the opportunities and obstacles presented by such advanced digital environments.

This study aims to enlighten the academic and educational sectors about the metaverse's emergent role in learning. With some educational scenarios already leveraging the metaverse's potential, there's ample scope for broadening the research horizon. Exploring the metaverse's implications across various educational levels, from primary to tertiary, becomes vital. Additionally, the metaverse's immersive attributes present transformative opportunities for students with developmental challenges, enabling the transcendence of disability-induced barriers. As such, research into the metaverse's applications for students with unique learning requisites becomes paramount.

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Research Article

Essential Learner Characteristics in Distance Education According to Experts

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Abstract: The importance and impact of distance education are increasing thereby making it imperative to study its effectiveness and efficiency as regards student success. In this study, we focused on the importance of factors related to student success and priorities in distance education according to experts. We conducted a literature review for developing a spectrum of variables, as well as a survey method for collecting expert views to determine their order of importance. We scanned WoS-indexed journals in the Web of Science database using these variables, adding the keywords "online learning" and "distance education" between 2010 and 2022 to calculate the frequencies of the variables in research papers to confirm our proposed variables. We took the views of 15 academics working in the field of distance education to determine their priorities. According to the results, self-regulation was the most important learner characteristic for success in distance education. This variable was followed by learning self-efficacy, motivation, technology self-efficacy, cognitive learning strategies, goal setting, metacognitive skills, attitude towards e-learning, locus of control, and academic self-concept. These variables should be considered in instructional design processes, and be monitored and developed in distance learners for success.

Keywords: Distance Education, Learner Characteristics, Expert Opinion

1. Introduction

Distance education is a significant component of academia that contributes to formal education and supports lifelong learning and professional development opportunities. By providing flexibility and autonomy to support learning (Gümüş & Fırat, 2016; Moore, 2013; Schneller & Holmberg, 2014), enabling individuals to progress at their own pace, facilitating access to rich and diverse learning resources and materials (Şirin & Tekdal, 2015), responding to individuals' desires for self-improvement (Gül & Arabacı, 2018), and facilitating the development of micro-competencies (Pollard & Vincent, 2022), distance education is drawing increasing interest.

Furthermore, the COVID-19 pandemic has turned online and distance education into a solution for the continuity of formal education. The pandemic has made remote operation of education systems mandatory. However, this situation caught students, teachers, administrators, parents, and other stakeholders unprepared in many aspects. The rapid transition to emergency remote education during this pandemic, referred to as urgent distance education in the literature (Karadağ & Yücel, 2020), has drawn attention to criticisms of its effectiveness and findings related to learning losses (Donnelly & Patrinos, 2021). Even before the pandemic, there were criticisms of the success rate in distance education. Examples of these criticisms include lack of motivation (Kuloğlu, 2020; Uçar & Kumtepe, 2016), inability to receive instant feedback (Şirin & Tekdal, 2015), insufficient interaction (Cole et al., 2014; Kuo et al., 2013), technical inadequacy, time constraints, not feeling a sense of belonging to the learning group (Enfiyeci & Filiz, 2019), and inability to set goals (Neroni et al., 2018).

The question of whether distance education is more effective than face-to-face education is an old yet still relevant topic in the field, and there is no simple answer. While some studies claim that face-to-face instruction is more productive (Deka & McMurry, 2006; Helms, 2014), others suggest that students can be equally successful in distance education (Deka & McMurry, 2006; Dell et al., 2010; El Refae et al., 2021; Fouad et al., 2021; Glazier et al., 2020; Gürsul & Keser, 2009; Horspool & Lange, 2012; Iglesias-

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Pradas et al., 2021; Larson & Sung, 2009; Yen et al., 2018). These conflicting results may stem from insufficient consideration (and control) of learner characteristics, which has become a significant factor in research and comparisons.

In online learning environments, students are responsible for their own learning and decide when, where, how, and for how long they will access learning materials. When examining the literature, variables influencing students' success in online environments include self-regulation (Jansen et al., 2020; Kizilcec et al., 2017; Šašić, 2023; Zimmerman, 2000), self-efficacy (Won et al., 2023), motivation (Kuloğlu, 2020; Pan, 2023; Zikai & Yuanyuan, 2023), technology skills (Wang et al., 2013), personality traits (Bahçekapılı & Karaman, 2015), learning styles (Çakıroğlu, 2014), immediate feedback (Şirin & Tekdal, 2015), interaction (Cole et al., 2014), a sense of belonging to a learning group (Enfiyeci & Filiz, 2019), goal setting (Neroni et al., 2018), cognitive learning strategies, academic self-concept (Zhang et al., 2022), and metacognitive skills (Rivers et al., 2020; Anthonysamy, 2021). Li (2002) points out in her study that distance education might not be suitable for everyone as learners need specific skills and competencies to be successful in distance education. Therefore, identifying and examining these variables is crucial, and efforts should be made to determine the factors influencing learning performance and success rate in distance education.

In the literature, there are studies that examine the factors influencing success in distance learning environments. For instance, Alhabeeb and Rowley (2018), categorized factors related to learner success in online learning environments from the perspective of both students and academics. These categories from the students' perspective are technological infrastructure, instructor characteristics, student characteristics, e-learning resources, support and training, ease of access, and seeking help. From the viewpoint of the, the categories include student characteristics, e-learning system, experience, ease of access, instructors, e-learning support, support and training, e-learning tools, and participation. Variables considered as common elements by both academics and students in the study were identified as student characteristics, instructor characteristics, support and training, and ease of access.

In a systematic review conducted by Martin et al. (2020) examining research on online learning and teaching from 2009 to 2018, findings related to learner characteristics indicated that studies focused on self-regulation skills, motivation skills, academic skills, attitudes, cognitive, and demographic characteristics without a specific order.

Min and Yu (2023) conducted a systematic review examining the factors influencing success in blended learning environments, focusing on the dimensions of learners, teachers, materials, and objectives. It was concluded that critical factors affecting success in the learner aspect include learners' characteristics, learning pace, commitment, attitudes, motivation, cognition, computer proficiency, and demographic characteristics. Similarly, Rizana et al. (2020) conducted a systematic review on the variables affecting the success of e-learning processes from different viewpoints. Within this scope, variables such as computer self-efficacy, attitude toward e-learning, and self-regulated learning in the learner aspect were obtained. Reviewing the literature reveals that factors influencing success in online learning environments are examined from various capacities. Although similar results are obtained in studies, differences are also noticeable. Another notable point in the studies is the lack of consensus on which of these variables affects success more. In this regard, our study is significant in filling the gap in the literature.

The presented studies address numerous variables related to student characteristics that can influence learning and success in distance education. This study aims to identify the variables influencing learning and learner success and priorities in distance education environments based on expert opinions. In this context, this study aims to provide insights to professionals creating distance education environments and researchers in the field of distance education. For this aim, the study focuses on the following

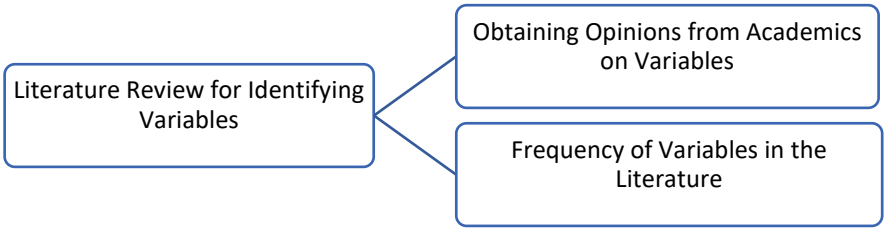
research questions: (1) What are the prominent variables in articles related to learner characteristics in the literature indexed in scientific journals on the Web of Science indexes? (2) According to the opinions of academics and professionals in the field, what is the order of priority with these variables?

2. Methodology

We conducted a descriptive literature review and established a survey model in this study. Through an extensive review of the existing literature, the authors determined the variables affecting learners' performance in distance learning environments. The data obtained from the literature review was presented for expert review in a survey. Survey studies are the types of research in which the views of a group are ascertained (Büyüköztürk et al., 2024).

Figure 1

Flowchart of the Study



2.1. Participants

Within the scope of this study, we invited 20 published experts with field experience who carry out scientific studies, such as a director in a distance education center or a creator and manager of a distance education environment. A total of 15 experts accepted our invitation to participate in the research. Three were 3 women, 12 were men, and all were academics; their title, gender, and fields of expertise are presented in Table 1.

Table 1

Personal Information of Experts who Participated in the Study

Expert	Title	Gender	Field of Study
E1	Prof. Dr.	F	Computer and instructional technology education, information technology education, open and distance learning, distance education design and management
E2	Prof. Dr.	M	Computer and instructional technology education, open and distance learning, distance education design and management, instructional design
E3	Prof. Dr.	M	Computer and instructional technologies education, open and distance learning, distance education design and management, instructional design, educational technologies
E4	Prof. Dr.	F	Computer and instructional technology education, information technology education, open and distance learning, distance education design and management
E5	Prof. Dr.	M	Distance education, m-learning, e-learning, open education resources
E6	Prof. Dr.	F	Computer and instructional technologies education, distance education design and management, instructional design, educational technologies

Expert	Title	Gender	Field of Study
E7	Prof. Dr.	M	Computer and instructional technology education, distance education design and management
E8	Assoc. Prof.	M	Computer and instructional technologies education, information technologies education, instructional design, distance education design and management, educational technologies
E9	Assoc. Prof.	M	Online learning, blended learning, massive open online courses (MOOC), technology-enabled learning environments
E10	Assoc. Prof.	M	Computer and instructional technology education, information technology education, open and distance learning, distance education design and management
E11	Assist. Prof.	M	Computer and instructional technology education, information technology education, open and distance learning, distance education design and management
E12	Assist. Prof.	M	Computer and instructional technology education, information technology education, open and distance learning, distance education design and management
E13	Assist. Prof.	M	Educational sciences, curricula and teaching, educational/educational technologies
E14	Assist. Prof.	M	Computer and instructional technology education, educational technologies, open and distance learning, instructional design
E15	PhD	M	Computer and instructional technology education, educational technologies, open and distance learning, educational technologies

The experts have studied distance education, open and distance learning, instructional design, and online learning. Seven of them are professors, three of them are associate professors, four of them are assistant professors, and one of them has a PhD.

3. Data Collection Process

We collected data three times in this study. Initially, we collected data from a general literature review to determine all variables affecting the success of distance education. The purpose of this initial review was to establish the spectrum of the variables. Then we conducted a survey with experts to determine the importance of the variables. And finally, we did a second literature review with narrowing indexes and calculated the frequencies of the variables to check whether they are compatible with the experts' views. The variables affecting students' success in online learning were initially determined by conducting a general literature review. Papers published before and in 2021, and indexed in Google Scholar, ERIC, ScienceDirect were covered. The keywords of "distance learning", "distance education", "e-learning", "learner success" and "online learner" were used. The purpose of this first review was only to determine the variables, and we did not collect and calculate quantitative data for this part. 12 variables were obtained from this review. Then we consulted the experts on these variables to determine their views. After that, we performed a second literature review for identifying the frequencies of these variables from the Web of Science database to confirm their significance. The selection criteria for the articles included in the second literature review are as follows:

- Date of publication from 2010 to 2022 (both years are included)
- Articles published on the WoS-indexes
- Keywords used in searches are included in the title or keywords of the study

The number of articles according to keywords is presented in Table 2. The list of variables obtained from the literature review, along with their definitions, was given to three experts for a preliminary check and feedback. The form, which was finalized after the feedback was received, was sent via e-mail to experts. The experts were asked to score them according to their effect on learning in distance education with 1 being not important and 10 being very important.

4. Findings

The initial literature review resulted in 12 variables. These variables were obtained from the WoS-indexed journals in the Web of Science database, adding the "online learning" and "distance education" keywords. Duplicate articles were removed, and studies relating to the predetermined principles were selected. These articles were individually examined, and their keywords were also reviewed for appropriateness. The number of studies for each variable are presented in Table 2. These variables were, from higher frequency to lower, self-regulation skills, cognitive learning skills, goal orientation, locus of control, motivation, academic-self-concept, metacognitive skills, self-efficacy toward technology, attitude toward online learning, autonomy, and self-efficacy toward online learning. There are 11 variables in Table 2 because the demographic variables in the literature also had several dimensions and sub-dimensions (level of education, type of delivery, study type, gender, and so forth), resulting in many studies related to this variable. Listing them under one heading would have been ambiguous, so we excluded them from the table and consulted the experts.

Table 2

Keyword Groups in Literature Review and Their Frequencies

Variables	Frequencies
"Self-regulation" + learning	356
Cognitive learning skills	162
"Goal Orientation" + learning	130
"Locus of Control" + learning	60
"Motivation" + "online learning"	24
"Academic Self-Concept" + learning	24
"Metacognitive skills" + learning	21
Technology Self-efficacy	17
"Attitude" + "online learning"	12
"Autonomy" + "online learning"	11
"Online Learning" + "Self Efficacy"	7

The experts were consulted on the variables in Table 2 to determine their order of significance. The feedback given by the experts for each variable are presented in Table 3. In Table 3, we abbreviated the names of the variables to provide ease of use for reporting.

Table 3

Expert Feedback on the Variables

	TSE	MS	SRS	SEL	M	CLS	AS	SA	LC	DC	A	GS
E1	7	9	10	10	10	8	7	8	8	6	8	9
E2	7	8	10	7	9	7	6	9	4	3	5	6
E3	8	7	7	9	5	7	8	9	8	5	8	7
E4	10	6	10	6	10	8	6	8	8	1	10	8
E5	10	10	10	10	10	10	3	6	4	4	7	10
E6	7	10	10	9	9	9	8	9	8	7	8	9
E7	9	7	10	10	6	7	8	10	6	6	8	10
E8	9	8	10	9	8	8	7	6	6	5	6	5
E9	4	7	10	8	8	8	4	4	9	5	8	9
E10	9	7	10	10	9	7	7	9	6	5	8	7
E11	9	7	7	9	8	7	6	7	6	5	9	9
E12	10	8	10	10	10	10	8	5	7	2	10	10
E13	7	10	10	10	10	10	9	9	9	9	9	10
E14	8	8	10	7	8	7	6	7	6	6	6	6
E15	10	7	9	10	10	8	7	8	8	6	8	7
Mean	*8.3*	*8*	*9.5*	*8.9*	*8.7*	*8.1*	*6.7*	*7.7*	*6.9*	*5*	*7.9*	*8.1*
SD	*1.7*	*1.3*	*1.1*	*1.3*	*1.5*	*1.2*	*1.6*	*1.7*	*1.6*	*2*	*1.4*	*1.7*

TSE: Technology Self-Efficacy, MS: Metacognitive Skills, SRS: Self-Regulation Skills, SEL: Self-Efficacy for Learning, M: Motivation / Motivation (For E-Learning), CLS: Cognitive Learning Strategies, AS: Academic Self Concept, SA: Student Autonomy, LC: Locus of Control, DC: Demographic Characteristics, A: Attitude (Towards E-Learning), GS: Goal Setting.

According to the scores given by the experts, the most important variable affecting students' success in open and distance learning is self-regulation, with a 9.53 average (SD: 1.1) out of 10 points. In addition to self-regulation skills, the variables of self-efficacy for learning (M:8.93, SD:1.3), motivation (M:8.66, SD:1.5), technology self-efficacy (M:8.26, SD:1.7), and goal setting (M:8.13, SD:1.7) were also among the top 5 variables. According to the experts, among the 12 variables, demographic (M:5, SD:2) differences were the least important factor in distance learning.

Considering the expert opinions and the study frequency data in the literature, self-regulated learning skills were the most prominent variable affecting success in distance learning environments.

5. Discussion and Conclusion

Ensuring student success in distance education differs from traditional education. Different variables affect this process because students are physically far from instructors, classrooms, and classmates. Online learner variables can affect learning processes and online learning may not be appropriate for every learner (Kaufmann, 2015). There are some studies investigating external, internal, or systemic factors such as content quality, LMS and system quality, provided interaction, perceived enjoyment and satisfaction, usage and demographics (e.g. sex, age, GPA), institutional/administrative support, system

configuration and technical design, the level of computer skills among learners that affect the success of distance education (Eren, 2024, James, 2021; Pinzon & Guarnizo, 2022; Rizana et al., 2020; Simpson, 2012). However, there are very few studies on prioritizing learner-related variables when designing distance education. Learner characteristics are one of the most important critical success factors besides teacher characteristics, course materials and objectives, learning components according to institutional objectives, ICT system, and learning environment (Min & Yu, 2023). This study focused on learning components and their prominence. Distance educators and DE Institutions should know their students' attributes and how to assist them to be successful (Yükseltürk & Baturay, 2012).

According to the results, self-regulation skills and, directly related to them, self-regulated learning (SRL) skills can be defined as the prominent variables affecting learner success in distance education. Self-regulation is self-constructed thoughts, feelings, and behaviors toward achieving goals (Zimmerman, 2000), while self-regulated learning is the degree to which students actively participate in their own learning processes (Zimmerman, 2008). Self-regulated learning plays a significant role in learners' success in distance and online education (Sharp & Sharp, 2016). It helps them to monitor, control, and regulate their cognitive motivation and behavior according to their goals (Co & Shen, 2013). In a distance learning environment, self-regulating learning is crucial for students to learn independently and achieve better outcomes satisfactorily (Turan et al., 2022). Students who engage in peer self-regulated learning in a distance teaching system show better motivation, self-efficacy, and reflection after learning activities (Kuo et al., 2023). Additionally, self-regulated online learning skills significantly predict academic success in distance education (Tülübaş, 2022; Xu et al., 2022). Strengthening the self-regulatory characteristics of participants in distance education programs can improve completion rates and positively contribute to students' success in distance education. According to Duzgun and Basaran's study (2021), during the COVID 19 pandemic, self-regulated learning was the second significant predictor of distance education success after their previous face-to-face achievement among primary school students, and they have significant, positive, and moderate correlation. Another study conducted with postgraduate students showed that SRL was the second significant predictor of students' satisfaction after tutor-students interaction (Lysitsa & Mavroeidis, 2024). These results confirm that SRL is the prominent variable as a learner trait. Educators and students see distance education as a good alternative to face-to-face but students with low self-regulation and low self-efficacy may have problems in learning in this way and need support (Roick et al., 2023). This issue is very important for administrators, educators, and instructional designers.

The second prominent variable is self-efficacy for learning. Self-efficacy is an individual's ability to perform the actions necessary to complete a task successfully (Bandura, 1977). Research indicates that self-efficacy beliefs can significantly impact students' motivation, persistence, and willingness to engage with course materials in online settings and play a crucial role in their engagement, performance, and overall success in distance education (Wu, 2023).

The third variable is motivation. Motivation is effective in initiating and maintaining activities for a specific purpose (Schunk et al., 2014), such as continuously working on a learning task, even if it is hard. Motivation is another important factor in students' success in distance education. If online learning activities are not well-designed and developed, they may not stimulate student motivation and related learning performance (Zikai & Yuanyuan, 2023). The learning activities must be appropriate to the learners, and continuous improvements and revisions are necessary to make learning activities more effective in the course delivery.

Technology self-efficacy is the fourth important variable. Technology self-efficacy is the belief that an individual has sufficient and correct skills to be successful in dealing with a technology-related task (Wang et al., 2013), such as using ICT in distance education. In the literature, there was a highly

significant positive relationship between academic self-efficacy and self-efficacy to use ICT, and self-efficacy for IT use is a good predictor of academic self-efficacy in distance education (Ali, 2021). An ICT course may be provided to e-learners as a prerequisite to enhance their academic self-efficacy and success.

Cognitive learning strategies, the fifth variable, are the ability of an individual to think, monitor, and evaluate their own learning while performing a learning task (Dabbagh, 2007). Cognitive learning strategies play an important role in affecting learners' learning experiences and success in distance education (Neroni et al., 2019). This research highlights the importance of incorporating cognitive learning strategies in distance education for learners to enhance their performance and learning. Monitoring them and providing some courses to develop students' learning strategies when needed may help increase achievement in distance education.

The other important learner characteristics are as follows: goal setting is the progress of the learning process or a conscious effort towards goals (Zimmerman, 2000). Goal orientation and self-regulation strategies were positively related to academic achievement in distance education (Zhou & Wang, 2019). Goal orientation is a positive predictor of academic performance in distance education (Neroni et al., 2018). Metacognitive skills are the individual's awareness of his own cognitive structure and learning characteristics and the ability to monitor and regulate his own cognitive processes (Yükseltürk & Bulut, 2007). Students using metacognitive strategies in online learning can evaluate their learning and put more effort into regulating their learning process (Anthonysamy, 2021). Distance learners should be provided with practice on how to utilize metacognitive strategies to enhance learning and performance.

Attitude encompasses feelings and behaviors during the learning process. There are many studies about learners' attitudes toward distance education, especially during the COVID-19 pandemic. There are high attitude results (Marjerison et al., 2020), and low attitude results (Kaban, 2021). According to Tuckel and Pok-Carabalona (2023), students' attitudes affect their preferences and tendencies about distance education. Learner autonomy refers to the learner's freedom to independently organize and monitor their own learning process by making decisions about what, when and how to learn based on their individual needs, interests and abilities. (Boyadzhieva, 2016). There was a positive correlation between learner autonomy and student-student and tutor-student interactions (Fotiadou et al., 2017). Moreover, students' autonomy affects their satisfaction with distance education (Abuhassna et al., 2020). Locus of control is a belief about the extent to which behavior (internal or external) influences successes or failures (Whittington, 1995). As expected, in some studies, distance learners with internal locus of control had high achievements, and those with external locus of control had low achievements (Naseer & Majid, 2018). However, sometimes, there was no significant effect (Gökçeaslan & Alper, 2015). Academic self is expressed as the degree of belief and self-confidence that the individual will be successful in a job where the academic aspect is dominant (Dabbagh, 2007). There is a positive and strong relationship between academic self-concept and academic achievement in distance learning (Ajmal & Rafique, 2018), and it is suggested that workshops be prepared to enhance students' self-concept so that they may understand their potential and abilities to perform better in distance education. Demographic factors such as age, gender, class level, socioeconomic status, family and work responsibilities, and other personal characteristics can influence students' experiences, performances, and outcomes in distance education. There are too many studies about these variables and their effects on distance learning. Understanding and considering these demographics' effects on distance education can help educators improve their distance education programs to meet their students' needs.

It can be said that self-regulation is an umbrella concept covering self-efficacy, motivation, cognitive and metacognitive strategies, and goal setting (Pintrich, 2000, 2004; Pintrich et al., 1991; Zimmerman, 2011). At this point, we do emphasize the importance of self-regulation in distance education (Barnard-

Brak et al., 2010; Cazan, 2012; Lavasani et al., 2011; Sharp & Sharp, 2016; Wang et al., 2013; Yükseltürk & Bulut, 2007; Zimmerman, 1990; Zimmerman, 1986).

In conclusion, learners' self-regulation, self-efficacy, motivation, cognitive strategies, metacognitive skills, and other characteristics play an important role in their success in distance education. This study tried to draw a picture of these variables to highlight and prioritize them. We suggest instructional designers and educators consider monitoring and incorporating these variables to provide support to help students utilize and develop these skills effectively in distance education. These personal factors in distance education will be foci, and new studies will contribute to further practice and research in better learning in distance education. Their effects on learning can be determined comparatively in more detail, and predictions can be made for learner success by developing measurement and learner support and development models. The needs of the students can be considered before instruction or within instruction with these models, and proper support can be available to the students when needed.

6. Limitations

The factors discussed in this study naturally reveal a general point of view in online and distance education. The order of importance of these features may vary depending on contextor the learners' level. We recommend that future research and applications be carried out by collecting data from learners, constructing them according to these contextual features, and conducting research that will reveal the effects of these variables specific to the context.

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Research Article

Examining Pre-service Mathematics Teachers' Purposes of Using ChatGPT in Lesson Plan Development

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Abstract: This study aimed to examine pre-service middle school mathematics teachers' purposes of using ChatGPT in lesson plan development. Phenomenology, one of the qualitative research designs, was applied in this study. A total of 56 third-grade pre-service middle school mathematics teachers, 43 females and 13 males were selected for the study. A questionnaire with open-ended questions was employed to gather data. First, pre-service teachers were asked to select one or more learning outcomes in the mathematics curriculum and prepare a lesson plan to address these outcomes using the ChatGPT program. Then, they completed the questionnaire. Content analysis was utilized in the current study to analyze the data. According to the results of the study, ChatGPT served as a valuable tool for pre-service mathematics teachers during lesson plan development. While not all participants utilized it for every subcategory, ChatGPT played a significant role in various aspects, including determining the subject scope, getting creative and interesting ideas, explaining math concepts, establishing relationships and the course flow, developing learning activities, problems, and evaluation tools, and even reviewing and improving the lesson plan. Moreover, pre-service teachers used ChatGPT to deepen their knowledge of mathematical concepts, learning strategies, and teaching models. However, it is important to remember that ChatGPT should be viewed as a support system, not a replacement for a teacher's knowledge and expertise.

Keywords: Artificial Intelligence, ChatGPT, Pre-Service Teacher, Lesson Plan, Education

1. Introduction

Recent technological advancements and expansions have led to more sophisticated and innovative digital content production techniques, such as generative artificial intelligence. Artificial intelligence (AI) has achieved extraordinary success in processing text, and the results are often indistinguishable from what humans can produce (Bishop, 2021). Advanced AI systems called large language models are made to comprehend and produce text that resembles that of a person. Large volumes of text data are used to train these models, like the GPT (Generative Pre-Trained Transformer) series, to identify patterns and linguistic structures in human language. They can create text, translate it, summarize it, and do many other linguistic activities (OpenAI, 2024). Chatbots are computer programs that simulate human-to-human conversation using chat interfaces. The AI-based chatbot known as ChatGPT (Chat Generative Pre-trained Transformer) was introduced as a prototype by OpenAI on November 30, 2022, and it quickly gained publicity for its extensive and well-spoken answers to queries covering a wide range of technical and professional knowledge disciplines (Wikipedia, 2024). Due to its substantial text data training, ChatGPT can interpret the context, intent, and tone of user input, allowing it to provide insightful and accurate answers (Haleem et al., 2022).

A supercomputer, a device with massive processing capacity and adaptive behaviors like adding sensors and other characteristics that allow it to work and think like a person, comes to mind when one thinks about AI. The use of AI in education has expanded, going beyond the traditional idea of AI as a supercomputer to include embedded computer systems (Chen et al., 2020). Education is one of the industries that will benefit greatly from artificial intelligence technology. AI has revolutionized education by making learning easier and fostering greater independence in students (Osman & Ahmed, 2024). Educational practices around the world have changed rapidly in recent decades, largely due to

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technological breakthroughs. Among these technological advancements, artificial intelligence models such as ChatGPT is one of the most important and influential forces (Grassini, 2023; Makridakis, 2017).

For teachers, preparing lesson plans that are effective, purposeful, and responsive to student needs and differences can be daunting tasks. One of these difficulties is that the fundamental components of a lesson plan—learning objectives, learning activities, and assessment—are not addressed or integrated (Sebullen, 2023). ChatGPT offers rapid access to a wide range of information and teaching methods, and it can generate summaries and educational resources to support lesson planning (Castro et al., 2024). Furthermore, ChatGPT allows teachers to brainstorm and develop creative ideas by generating ideas, suggesting relevant resources, and providing summaries of complex information. In this way, it can assist in the lesson planning process. Similarly, Kasneci et al. (2023) mentioned its ability to aid brainstorming, but they also stressed the need for review to guarantee accuracy and avoid plagiarism. ChatGPT can assist teachers in identifying instructional materials and creating plans; however, it is not an alternative for teachers. Rather, it should be employed to support teachers by offering ideas for better teaching methods and up-to-date instructional materials (Samala et al., 2024). It can also help teachers to create customized lesson plans for teaching with a set of parameters and constraints. Additionally, AI can serve as a starting point for novice teachers with less teaching experience and pedagogical knowledge (Farrokhnia et al., 2023). Moreover, "AI can be used to automatically grade assignments and assessments, which can save time and reduce the workload for teachers" (Zhai, 2022, p. 5). ChatGPT can also create exercises, tests, and even personalized assessment materials for specific learning objectives (Farrokhnia et al., 2023; Zhai, 2022). Overall, the use of AI for lesson planning has the potential to greatly increase the efficiency and effectiveness of education by enabling educators to plan lessons and other resources and providing students more easily and accurately with more personalized planning options (Fuchs, 2023; Zhai, 2022).

A study by Baidoo-Anu and Ansah (2023) summarizes earlier research to offer some potential benefits of ChatGPT in advancing education. Among the many advantages of ChatGPT are its ability to facilitate personalized and interactive learning and generate ideas for formative assessment tasks that provide continuous feedback. The study offers suggestions for enhancing classroom instruction through the use of ChatGPT. Consequently, the researchers argued that educators might use ChatGPT and further generative AI-based technologies to support their students' learning. According to a study by Alshahrani (2023), ChatGPT could be used to customize learning and increase engagement. The study provided a model for sustainable learning that incorporates AI and assessed the application of AI approaches in enhancing the sustainability of educational settings. The results of the study demonstrated the possible advantages of incorporating ChatGPT and other AI chatbots into the classroom. These advantages included encouraging student motivation, engagement, and self-directed learning through rapid feedback and support. ChatGPT and similar AI technologies offer numerous promising opportunities for education, but it is important to be aware of their limitations and potential drawbacks. Undoubtedly, the primary drawback of implementing ChatGPT in education is the possibility of false information. Despite ChatGPT's extensive training on vast amounts of data, there remains a possibility that it may provide erroneous or incomplete information. For educators lacking the necessary expertise or time, monitoring ChatGPT responses poses a considerable challenge (Samala et al., 2024).

This study aimed to examine the purposes of pre-service middle school mathematics teachers in preparing lesson plans using ChatGPT, an AI tool. Intelligent teaching systems that use AI to adapt content to each student are widely used in many classrooms (Molenar, 2021). Technology integration in teaching enriches the learning experience compared to traditional teaching methods. Artificial intelligence can assist teachers with tasks such as grading, lesson planning, and providing feedback (Singh & Singh, 2021). Similarly, AI tools such as ChatGPT are important tools for teachers to use technology effectively when creating course materials (Vincent-Lancrin & Van der Vlies, 2020). AI tools

like ChatGPT can save teachers time when creating and editing course materials. This way, teachers can focus more of their time on interacting with students and supporting learning. The other role of AI is to support human intelligence and help people with learning tasks (Osman & Ahmed, 2024). By offering individualized feedback, detecting trends in data, and facilitating group learning, AI has the potential to raise the standard of instruction. However, there are other challenges in incorporating AI into educational settings, such as dealing with ethical and privacy issues and ensuring that AI-based systems are compatible with human values (Renz & Vladova, 2021). In this context, pre-service mathematics teachers' purposes of using ChatGPT in the lesson plan development were examined. For this reason, the main research problem of the study is:

MP: What are the purposes of pre-service mathematics teachers in using ChatGPT in lesson plan development?

The research problem has two sub-problems:

SP1: To what extent do pre-service mathematics teachers use ChatGPT for creating lesson content?

SP2: How does ChatGPT support pre-service mathematics teachers in deepening individual knowledge and eliminating deficiencies while developing lesson plans?

2. Method

Determining and interpreting the shared meaning of people's experiences and perceptions of a phenomenon or idea is the aim of phenomenological research (Creswell, 2013; Yıldırım & Şimşek, 2018). In the same way, the current study aimed to examine the purposes of pre-service mathematics teachers in using ChatGPT when developing lesson plans. Therefore, phenomenology, one of the qualitative research designs, was applied in this study.

2.1 Participants

The study participants were chosen through the use of the method of convenience sampling voluntarily. The researcher benefits from speed and practicality while using the convenience sampling method (Yıldırım & Şimşek, 2018). In the spring semester of the 2023-2024 academic year, third-grade pre-service teachers enrolled in the middle school mathematics teaching program of a state university in Turkey were selected as participants of the research. A total of 56 pre-service middle school mathematics teachers, 43 females, and 13 males were selected for the study. All pre-service teachers took an "Information Technology" course that was about computer systems, software, and data and information processing. In addition, a conference on the use of AI in education was given to pre-service teachers at the end of the fall semester of the 2023-2024 academic year.

2.2 Data Collection

A questionnaire with open-ended questions was employed to gather data. The researcher prepared the questionnaire. In the questionnaire, there were an open-ended question and three follow-up questions. The purpose of the follow-up questions was to help participants understand the target response level and to enhance the depth of the data by prompting deeper responses from them. First of all, pre-service teachers were asked to select one or more learning outcomes in the mathematics curriculum and prepare a lesson plan to address these outcomes using the ChatGPT program. Lesson plans were not included in the data analysis. The purpose of asking pre-service teachers to prepare lesson plans was to ensure that all of them experienced preparing lesson plans with ChatGPT. Then, they completed the questionnaire. Two experts, one in mathematics education and the other in Turkish education, were shown the initial draft of the questionnaire. Three pre-service teachers who developed lesson plans

using the ChatGPT program but were not participating in the research were asked to respond to the questions to assess their clarity and understandability. The completed questionnaire was provided in its final version after the required adjustments were made. The questions in their final form are listed below:

Question: For what purpose did you use the ChatGPT program while preparing your lesson plan? Please explain in detail.

Follow-up questions: If you used the ChatGPT program during the lecture phase, for what purpose and how did you use it?

If you used the ChatGPT program during the evaluation phase, for what purpose and how did you use it?

If you used the ChatGPT program while preparing a lesson plan to deepen your own knowledge and eliminate your deficiencies, for what purpose and how did you use it?

2.3 Data Analysis

Content analysis was utilized in the current study to divide the data into manageable units (Patton, 2002). The content analysis method was used with the help of NVivo, a qualitative data analysis software. Content analysis is a method that requires in-depth analysis of the data and allows revealing previously undetermined themes and dimensions (Yıldırım & Şimşek, 2018). First, three main themes were created by considering three follow-up questions. Later, the first theme, the lecture phase, and the second theme, the evaluation phase, were combined and created lesson content due to overlaps and similarities. As a result, two main themes were created after data analysis: creating lesson content and deepening individual knowledge and eliminating deficiencies. Another field expert looked over the codes and themes that had been found. Ultimately, a concept map was used to define and explain the results. Information about the participants was given using abbreviations; for example, pre-service teacher 1 was coded as PT1.

2.4 Validity and Reliability

To strengthen the study's validity, quotes taken directly from participant responses were included while presenting the results. Additionally, preservice teachers were informed of the data analysis results, and their input was considered to depict the phenomenon accurately and impartially under study (Merriam, 2013). Moreover, some of the data obtained during the study were analyzed by a mathematics teacher as a second coder. Reliability of the data analysis was calculated using Miles and Huberman's (1994) formula, "Percent of agreement = [Agreements / (Agreements + Disagreements)]x 100." The percent of agreement between the two coders was found to be 98% and was considered reliable for this study (Miles & Huberman, 1994). The coders came together and agreed about the code under which the pre-service teachers should be coded by looking at the lesson plans of the pre-service teachers for the unanimous data. Ultimately, the latest version of the coding presented with frequencies under the findings was created (see Figure 1).

2.4 Ethical Principles

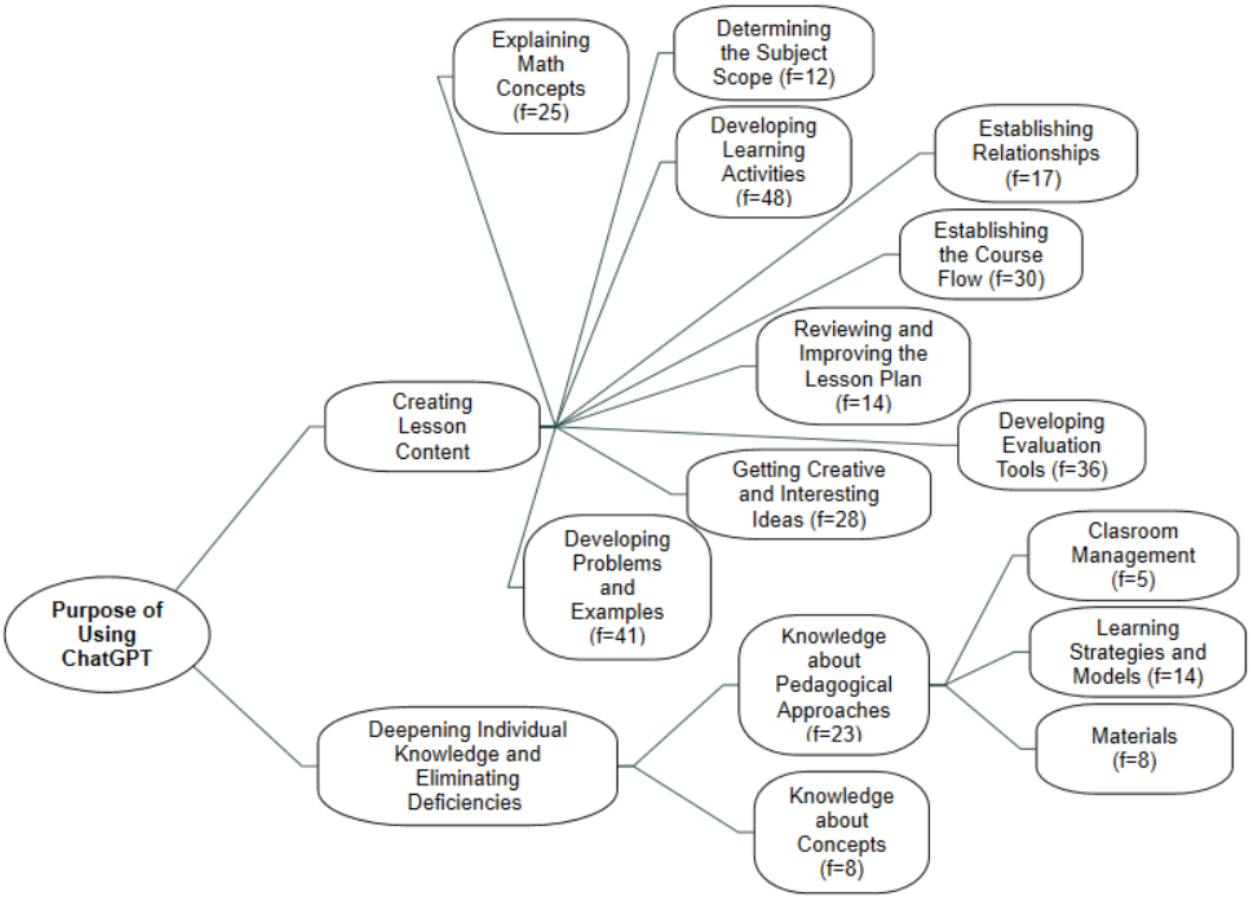
Ethics committee permission was received from Zonguldak Bülent Ecevit University Ethics Committee with the decision dated 04.04.2024 and numbered 588.

3. Findings

This section presents findings on pre-service teachers' purposes for using the ChatGPT program during lesson plan development. According to the analysis of data, pre-service teachers' purposes for using the ChatGPT program were classified under two main categories: creating lesson content and deepening individual knowledge and eliminating deficiencies. In Figure 1, the categories and subcategories are displayed in parentheses, along with the frequencies of participants in each category.

Figure 1

Categories and Subcategories about the Purpose of Using ChatGPT While Preparing Lesson Plan



3.1 Findings regarding creating lesson content

Under the first main category, creating lesson content, nine subcategories emerged: determining the subject scope, getting creative and interesting ideas, explaining math concepts, establishing relationships, establishing the course flow, developing learning activities, developing problems and exercises, developing evaluation tools, and reviewing and improving the lesson plan.

3.1.1 Developing learning activities

The majority of the pre-service teachers argued that they used ChatGPT to develop learning activities for their lesson plan. Some pre-service teachers directly gave the concept or learning outcomes in the curriculum for which they wanted to prepare a lesson plan and asked the program to prepare an activity. For example, two pre-service teachers said:

"When I asked the program to find an activity related to the subject, it suggested the bingo game." (PT3), *"It suggested activities that I had not thought of. So, I used it to develop learning activities for the lecture."* (PT44).

However, some participants guided the program and helped with activity preparation. For instance, a participant stated:

"I asked ChatGPT to generate activities for students in the exploration and elaboration phases. Since the exploration phase preceded the elaboration phase, I requested separate utilization of learning outcomes and preparation of two short and simple activities. In the elaboration phase, considering the topic's prior explanation, I wanted it to integrate the two learning outcomes I wished to teach into a single activity." (PT4)

Similar to the quote above, pre-service teachers directed the ChatGPT by telling the specific features of the activity, such as the phase of the lesson plan they wanted the activity for, the difficulty level of the activity, its duration, and its purposes. In addition, some participants used the program to improve and enrich the learning activities they designed. For instance, a participant said*:*

"I asked ChatGPT to create a bingo game with numbers and operations so that I could play it as an activity. It assisted me in organizing a lovely occasion in which the winner of the selected number would complete the transaction and shout BINGO. Thus, I developed it and wrote it." (PT49)

3.1.2 Developing problems and examples

The majority of pre-service teachers stated that they used ChatGPT to develop problems and examples for their lesson plans. Some pre-service teachers even highlighted its specific utility in generating diverse problems and examples. For example, two pre-service teachers stated:

"I can say that I primarily used artificial intelligence to generate problems. I believe that an effective lesson plan should captivate students and offer genuine insights. To maximize student achievement, I aimed to provide problems aligned with their abilities and interests. (PT36), "*I consider ChatGPT a valuable tool for generating problem and example ideas. It proved particularly helpful in crafting introductory problems and illustrative examples during concept explanations."* (PT14)

Pre-service teachers highlighted the value of generating diverse problems and examples related to the target subject matter using the program. In addition, they provided guidance to the AI concerning the desired difficulty level, complexity, and purpose of the problems and examples.

3.1.3 Developing evaluation tools

Many pre-service mathematics teachers used ChatGPT while developing evaluation tools for their lesson plans for various purposes. Some participants use AI to select suitable evaluation methods tailored to specific learning outcomes. To illustrate, two participants mentioned:

"I asked what kind of evaluation tool would be suitable for this learning outcome. Then, out of all the ideas, I requested the program prepare the one I thought was most appropriate." (PT1), "*First, I inquired about how to assess the learning outcome. Using the provided response as a foundation, I constructed the evaluation phase by requesting examples encompassing formative, summative, and self-evaluation components."* (PT34).

As seen in the above quotes, pre-service teachers used ChatGPT to determine which evaluation method would be appropriate for a particular learning outcome. Moreover, like the pre-service teacher in the last quote, some participants utilized the program in developing summative and formative evaluation

methods such as classroom observation, exams, quizzes, and projects. For example, two participants said:

> *"I requested that it design a game for the evaluation phase."* (PT7), *"ChatGPT suggested administering a mini-exam for the evaluation part.* (PT33)

Similar to quotes above, some participants received suggestions from the program for summative assessment, which evaluates students' learning outcomes at the end of a unit, course, or instructional period. Its main purpose is to determine to what extent students achieve their learning goals. However, some pre-service teachers used ChatGPT to develop self-evaluation tools. For instance, two of them stated:

> *"It recommended the self-assessment chart. I would never have considered evaluating students in this way; we always administer exams or similar assessments."* (PT30), "*It prepared self-assessment questions."* (PT19)

Although pre-service teachers did not think of preparing self-assessment tools, which would allow individuals to critically analyze their own progress, strengths, weaknesses, and areas for improvement, ChatGPT offered this option. Additionally, pre-service teachers utilized ChatGPT while preparing assignments for the lesson plan. Alternatively, as illustrated by the quote below, some pre-service teachers requested that the AI to customize evaluation activities to meet their specific needs. To illustrate, a participant mentioned:

> *" The plan lacked a homework component in the evaluation phase, so I asked the program to modify the evaluation phase to include homework."* (PT36).

3.1.4 Establishing the course flow

Most of the pre-service teachers stated that they used ChatGPT to establish the course flow. In other words, participants noted that ChatGPT helped them create the course flow by providing a step-by-step plan and general instructions for each step. For example, a participant expressed:

> *"At first, I directly asked it to prepare a lesson plan for me; it wrote the flow of the lesson minute by minute, so a lesson flow was created in my mind."* (PT54)

Pre-service teachers could gain a precise understanding of the tasks required at each stage of the lesson plan, enabling them to effectively organize their time. ChatGPT also assisted pre-service teachers in sequencing activities and allocating time for each. Moreover, according to pre-service teachers, AI facilitated the initial planning process by providing blank lesson plan templates or giving them sample lesson plans. To illustrate, two pre-service teachers said:

> *"I had ChatGPT create a general plan, and then I detailed it.* (PT18), *"I had ChatGPT prepare a lesson plan, and by examining it, I guided my own plan."* (PT19)

In this way, pre-service teachers stated that they could organize the content and scope of the course more easily. Furthermore, AI assisted pre-service teachers in maintaining the subject's logical flow by suggesting the optimal order of information presentation.

3.1.5 Getting creative and interesting ideas

According to the data analysis, half of the pre-service teachers argued that they used ChatGPT to generate creative and interesting ideas for their lesson plans. Participants claimed that AI helped them design innovative and creative activities and games. They mentioned that in this way, the lessons could be more entertaining, and they could create lectures that would attract the attention of the students. Some pre-service teachers stated that AI stimulated and activated their thoughts and ideas. In other

words, pre-service teachers thought that AI could stimulate creativity, encourage new thinking, and challenge existing assumptions. To illustrate, two participants mentioned:

> "*ChatGPT triggers my brain and encourages me to think differently."* (PT37), *"When I asked ChatGPT for examples from daily life, even if they were not always beautiful, it sparked creative thought processes. These initial ideas were forming the seed of a thought in my mind. So, when I did not have an idea about what to say or what to do, I used it because it provided problem and activity ideas."* (PT13).

As illustrated in the above quotes, some participants said that while not all of ChatGPT's suggestions were ideal, they found the tool helpful for generating and developing ideas. Additionally, they argued that ChatGPT stimulated their thinking by offering novel ideas and perspectives. As a result, participants emphasized the role of AI in stimulating intellectual growth and encouraging creative thinking.

3.1.6 Explaining math concepts

One of the purposes for which pre-service mathematics teachers used AI when preparing lesson plans was to explain math concepts. It was understood that pre-service teachers used ChatGPT for diverse purposes in explaining mathematics concepts. First, the participants stated that they use ChatGPT to explain complex mathematical concepts in a simpler and more understandable way. For example, a pre-service teacher said:

> *"Sometimes, when I asked it if it could explain a mathematical concept I wanted to explain in a simpler way or in a way that a child could understand, I often saw that the application explained mathematical concepts in a simpler and more understandable way.*

Some participants stated using ChatGPT to request simplified explanations or examples of math concepts often resulted in more understandable explanations. Moreover, AI helped pre-service teachers explain mathematical concepts in a way appropriate to the student's level. In this way, pre-service teachers were able to plan their lessons considering each student's comprehension level. Additionally, some participants requested detailed explanations of the properties of mathematical concepts from ChatGPT. To illustrate, two pre-service teachers stated:

> *"I requested a detailed explanation of exponent properties." (PT3), "I employed ChatGPT to define key concepts such as prime factors, prime numbers, and perfect numbers."* (PT55).

As seen in the quotes above, pre-service teachers used ChatGPT to obtain definitions and explanations of mathematical concepts. This approach enabled participants to develop course content with enhanced rigor and reliability.

3.1.7 Establishing relationships

Pre-service teachers used ChatGPT in various ways to establish mathematical relationships when preparing lesson plans. Some pre-service teachers argued that they used AI in their lesson plans to make relationships with daily life and other lessons. For instance, a participant mentioned:

> *"For the exploration phase of the plan, I used ChatGPT to prepare a temperature chart based on real-world examples. As temperature is also a science concept, this interdisciplinary approach was beneficial. Apart from this, in the elaborate stage, I prepared real-world problems, such as those involving pools and banks, with the assistance of ChatGPT."* (PT11).

In the quote above, the participant used AI to create the temperature chart and prepare problems that included examples from everyday life, such as pools and banks. Similarly, some participants integrated real-world applications of mathematics and interdisciplinary connections into their lesson plans with

the aid of ChatGPT. Moreover, the pre-service teachers said that they used AI to create relationships between mathematical concepts. To illustrate, a pre-service teacher said:

> *"Due to factors such as limited knowledge and imagination, identifying connections between concepts can be challenging. In such cases, ChatGPT effectively bridges these knowledge gaps."* (PT13).

AI helped the pre-service teacher make connections that he could not have thought of or imagined on his own. In addition, some pre-service teachers used AI to determine the prior knowledge that students should acquire and establish a relationship between the concept they wanted to teach in the plan and their prior knowledge.

Moreover, some participants utilized AI to establish relationships between different representations of concepts in lesson plans. For instance, a participant said:

> *"I got help with different representations of fractions. It gave me the idea that I could display it in decimal and percent format."* (PT20)

ChatGPT offered participants different perspectives and helped them better explain their connections with different representations of mathematical concepts.

3.1.8 Reviewing and improving the lesson plan

A few pre-service mathematics teachers used ChatGPT to revise and improve their lesson plans. Some participants asked the AI to correct their plans' semantic and grammatical errors. According to the statements of the pre-service teachers, AI helped make the lesson plans more understandable and fluent. To illustrate, a pre-service teacher stated:

> *"After writing the introduction part of the lesson plan, I asked ChatGPT to correct the punctuation and semantic errors in my text. It was successful."* (PT17)

Participants requested that ChatGPT enhance their lesson plans by providing additional details and resources. Through the generation of supplementary materials, diverse presenting techniques, and engaging activities, ChatGPT facilitated improvements in lesson plan quality. For example, a participant mentioned:

> *"When the initial lesson plan proved inadequate, I asked ChatGPT to create a more comprehensive and robust plan."* (PT21), "*I identified areas for improvement in the lesson plan and asked it to prepare it in a different way."* (PT23).

Some pre-service teachers asked AI to find the deficiencies in their lesson plans and correct them. AI pointed out the errors and flaws that pre-service teachers missed, enabling them to build their lesson plans on a stronger foundation.

3.1.9 Determining the subject scope

Too few pre-service teachers utilized ChatGPT to determine the subject scope. Some pre-service teachers used AI to investigate subject content, determine its scope, and check its suitability for grade level. For instance, two participants mentioned:

> "*For a sixth-grade learning outcome, ChatGPT helped define the subject's boundaries."* (PT35), *"When focusing on fifth-grade fractions, ChatGPT provided guidance on appropriate explanations and activities."* (PT20).

AI helped pre-service teachers make their lesson plans more comprehensive by giving them a broader perspective on the subject scope. However, some pre-service teachers stated that AI does not always

provide accurate information about the subject scope. Therefore, pre-service teachers should always check the information they receive from AI in the curriculum and evaluate it using their own knowledge. For example, a pre-service teacher said:

> *"I used it to determine the scope of the subject, but within the scope of the subject, it included not only the exponent number concepts taught in the sixth-grade, for which I prepared the lesson plan, but also the exponent number concepts taught in the eighth-grade."* (PT34).

3.2 Findings regarding deepening individual knowledge and eliminating deficiencies

Under the second main category, deepening individual knowledge and eliminating deficiencies, two subcategories emerged: knowledge about pedagogical approaches and knowledge about concepts.

3.2.1 Knowledge about pedagogical approaches

Some pre-service teachers used ChatGPT to get ideas about pedagogical approaches. They utilized the program to deepen their knowledge about learning strategies and models, materials, and classroom management.

3.2.1.1 Learning strategies and models

Pre-service teachers used AI to deepen their individual knowledge of learning strategies and models and to eliminate their deficiencies. In other words, pre-service teachers used ChatGPT to learn about different teaching models and techniques and choose methods that fit their lesson plans. To illustrate, two pre-service teachers stated:

> *"ChatGPT told me that I could create a discussion environment with the question-answer method in the introduction part."* (PT11), *"I learned about which methods are suitable for more permanent learning. I wanted to get information about the important approaches in education and create a plan accordingly."* (PT47).

As seen in the above quotes, ChatGPT helped pre-service teachers select appropriate teaching methods for their lesson plans. Moreover, AI helped pre-service teachers prepare more effective and student-focused lesson plans.

3.2.1.2 Materials

Few pre-service teachers utilized ChatGPT to design and select materials to use in their lesson plans. AI helped pre-service teachers find materials that would engage students and help them understand the subject better. For example, two participants said:

> *"I used the materials and ideas that were required for the learning outcome I selected."* (PT16), *"I asked ChatGPT what materials I could bring to the classroom to teach the subject well to students."* (PT50).

Pre-service teachers used AI to learn how to use instructional technologies in their lesson plans. AI assisted pre-service teachers in discovering technological tools and resources to enhance lesson interactivity and engagement. For instance, a participant mentioned:

> *"Following a dice activity, I sought ChatGPT's recommendations for software capable of graphically displaying results."* (PT40).

3.2.1.3 Classroom management

Too few pre-service teachers used ChatGPT to deepen their individual knowledge of classroom management. Pre-service teachers used AI to learn about classroom management techniques and how

to solve classroom problems such as peer bullying. AI has helped pre-service teachers create a more disciplined and safe learning environment. To illustrate, three participants stated:

> "*I asked about peer bullying in the evaluation part of the activity, and ChatGPT explained logically that the teacher should keep the environment under control in groups."* (PT18), *"ChatGPT provides information about different teaching methods, approaches, and classroom management, and that's why I used it when choosing the methods and techniques suitable for my plan."* (PT35), *"I specifically asked what the teacher's role should be in classroom management."* (PT41).

3.2.2 Knowledge about concepts

Only a few pre-service teachers utilized ChatGPT to bridge any conceptual gaps in their own understanding. Pre-service teachers used AI to find definitions of concepts they had not thought of, to better understand and give examples of concepts they did not know. To illustrate, three participants stated:

> *"I utilized it to look up definitions of ideas I was having trouble thinking of then."* (PT10), *"I thought it corrected my shortcomings by simplifying a subject I did not know and giving examples."* (PT13), "*I used ChatGPT to obtain an overview of exponents, clarifying the underlying concepts and addressing knowledge gaps.."* (PT34).

Pre-service teachers used AI to learn different definitions and perspectives of mathematical concepts. AI helped pre-service teachers look at concepts from a broader perspective and gain more comprehensive knowledge. For example, two pre-service teachers said:

> *"Since we prepared a lesson plan thinking that we would explain the learning outcome to the students in the lesson, I looked at the definitions of highest common factor and least common multiple and information on how to explain them to the students better to deepen my knowledge while preparing the plan."* (PT28), *"I wanted ChatGPT to come up with different definitions of the concepts related to my topic."* (PT41).

4. Results and Discussion

The current study aimed to examine the purposes for which pre-service middle school mathematics teachers utilized ChatGPT during lesson plan development. This study demonstrated different implications of ChatGPT on the development of lesson plans by pre-service mathematics teachers. The findings of the study showed that while some participants used AI only for certain tasks, a significant number benefited from its capabilities in various subcategories. The reason might be that ChatGPT offers rapid access to a wide range of information and teaching methods, and it can generate summaries and educational resources to support lesson planning (Castro et al., 2024). Educational practices around the world have changed rapidly in recent years, largely due to technological advances. Among these technological developments, AI models such as ChatGPT are one of the most important and effective forces (Grassini, 2023; Makridakis, 2017). For this reason, it is not surprising that most of the pre-service teachers benefited from ChatGPT's capabilities in various ways while preparing lesson plans. The majority of pre-service teachers stated that they used ChatGPT to develop learning activities for lesson plans. Some pre-service teachers asked the program to prepare activities by directly entering the subject they wanted to teach or the learning outcomes in the curriculum into the program. However, some participants contributed to the preparation of the activity by guiding the program. Pre-service teachers directed ChatGPT by specifying specific features, such as for which stage of the lesson plan they wanted the activity, at what difficulty level, for how long, and for what purpose. In addition, some participants used the program to enhance and enrich the learning activities they designed. Most pre-service teachers stated that they used ChatGPT to develop problems and examples for lesson plans.

Some even emphasized that they used the program specifically to find different problems and examples. Pre-service teachers valued the program's ability to generate diverse problems and examples related to the subject planned to be taught. They also guided the AI on the difficulty level, complexity, and purpose of the problems and examples. In a similar way, Farrokhnia et al. (2023) argued that AI helped teachers to create customized lesson plans for teaching with a set of parameters and constraints.

According to the findings of the research, many pre-service teachers benefited from the AI-supported ChatGPT program while developing evaluation tools for their lesson plans. This program helped pre-service teachers choose assessment methods suitable for different purposes. Some participants used ChatGPT to determine the most appropriate assessment method or tool based on their learning outcomes. Some of the participants had an idea from ChatGPT for formative assessment techniques that were used during the instructional process to gather information about students' progress, understanding, and learning needs. Moreover, some participants used the program to develop summative assessment tools, which aim to measure what students have learned at the end of the semester, such as exams, quizzes, and projects. However, unexpectedly, some pre-service teachers have created self-assessment tools to evaluate individual learning progress, strengths, and weaknesses with ChatGPT. Finally, it was observed that the program also allowed pre-service teachers to adapt their homework and evaluation activities according to their needs. Similarly, research studies proposed that among the many advantages of ChatGPT are its ability to facilitate personalized and interactive learning and generate ideas for formative assessment tasks that provide continuous feedback (Baidoo-Anu & Ansah, 2023).

Findings showed that most pre-service teachers stated that they used ChatGPT to create the course flow. The program helped pre-service teachers structure their lesson plans by providing a step-by-step plan and general instructions for each step. In this way, pre-service teachers were able to manage their time more effectively by clearly understanding the tasks needed at each stage of the lesson plan. ChatGPT also provided support in determining the order of activities and how long each activity would take. Participants stated that AI helped them to start the process by presenting them with a lesson plan template or giving them sample lesson plans. In this way, pre-service teachers could more effectively organize course content and scope. Finally, AI assisted in maintaining the topic's logical flow by suggesting optimal information presentation sequences. It is important to note that AI tools like ChatGPT can save teachers time when creating and editing course materials. Teachers will be able to devote more of their time to engaging with students and promoting learning in this way.

According to the results of the data analysis, some pre-service teachers stated that they used ChatGPT to find creative and interesting ideas for lesson plans. Participants stated that AI helped them design innovative and creative activities and games. They believed AI could enhance lesson engagement and create more captivating course content. Some pre-service teachers emphasized that AI activated their thoughts and ideas. Consequently, by fostering creativity, AI could reveal new ways of thinking and question existing assumptions. While not always satisfied with ChatGPT's suggestions, participants found value in using the program as a catalyst for idea generation and development. They also stated that AI stimulated their thinking processes by offering them new ideas and perspectives. In conclusion, participants emphasized that AI played an important role in promoting cognitive development and supporting creative thinking. To sum up, ChatGPT allows teachers to brainstorm and develop creative ideas by generating ideas, suggesting relevant resources, and providing summaries of complex information. In this way, it can assist in the lesson planning process. Similarly, Kasneci et al. (2023) mentioned its ability to aid brainstorming.

Pre-service teachers stated that they used ChatGPT in various ways to explain mathematical concepts while preparing lesson plans. Artificial intelligence helped them explain complex mathematical topics

in a simpler and more understandable way. Participants created content appropriate to the students' comprehension level by requesting simplified explanations or examples to ChatGPT. The program also helped participants prepare more robust and reliable course materials by explaining the features of mathematical concepts in detail. Apart from this, ChatGPT supported pre-service teachers in strengthening the connections between mathematical concepts by establishing relationships with daily life and other courses. AI also helped pre-service teachers make connections between concepts that they would not have thought of. Finally, some participants used ChatGPT to determine the prior knowledge that students needed to learn and establish the relationship between this prior knowledge and the concept they wanted to teach. Additionally, the program provided participants with a variety of viewpoints to clarify the connections between various concept representations. Overall, the use of AI for lesson planning has the potential to greatly increase the efficiency and effectiveness of education by enabling educators to plan lessons and other resources and providing students more easily and accurately with more personalized planning options (Fuchs, 2023; Osman & Ahmed, 2024; Zhai, 2022).

A small number of pre-service teachers used ChatGPT to review and improve lesson plans. Some participants asked the AI to correct semantic and grammatical errors in their plans. In this way, lesson plans became more understandable and fluent. Participants also enabled the program to enrich lesson plans by suggesting more materials, various presentation techniques, and activities. AI helped some pre-service teachers to create lesson plans on stronger foundations by detecting deficiencies and errors that they did not notice. However, very few pre-service teachers used ChatGPT to determine course scope. Some participants used AI to research the content, scope, and suitability of the topic for the grade level. AI provided pre-service teachers with a wider understanding of the subject matter, which enabled them to create more thorough lesson plans. However, some pre-service teachers stated that AI did not always provide accurate information about subject coverage. Therefore, pre-service teachers must critically evaluate AI-generated information against the curriculum and their own expertise. ChatGPT and similar AI technologies offer numerous promising opportunities for education, but it is important to be aware of their limitations and potential drawbacks. Undoubtedly, the primary drawback of implementing ChatGPT in education is the possibility of false information. Despite ChatGPT's extensive training on vast amounts of data, there remains a possibility that it may provide erroneous or incomplete information. For educators lacking the necessary expertise or time, monitoring ChatGPT responses poses a considerable challenge (Samala et al., 2024).

Some pre-service teachers used ChatGPT to gain ideas about pedagogical approaches for lesson plans. AI helped pre-service teachers deepen their knowledge of learning strategies and models and address their deficiencies. In other words, pre-service teachers used ChatGPT to learn about different teaching models and techniques and choose methods that fit their lesson plans. In addition, AI supported participants in preparing more effective and student-focused lesson plans. A small number of pre-service teachers used ChatGPT to design and select materials to be used in lesson plans. AI helped them to find materials that would engage students and help them understand the subject better. Pre-service teachers used AI to learn how to use instructional technologies in their lesson plans. AI helped participants find technological tools and resources that would help them make their lessons more interactive and exciting. Very few pre-service teachers used ChatGPT to deepen their individual knowledge of classroom management. Pre-service teachers used AI to solve classroom problems such as peer bullying and learn about classroom management techniques. AI helped pre-service teachers create a more disciplined and safe learning environment. Only a few pre-service teachers used ChatGPT to bridge conceptual gaps in their understanding. Pre-service teachers used AI to find definitions of concepts they had not thought of, to better understand concepts they did not know, and to give examples. Pre-service teachers learned different definitions and perspectives of mathematical concepts thanks to AI. ChatGPT can assist teachers in identifying instructional materials and creating plans; however, it is not a substitute for teachers. Instead, it should be used as a tool to support teachers by

suggesting innovative teaching strategies and providing access to current instructional resources (Samala et al., 2024). Ultimately, ChatGPT should be viewed as a supplementary tool, rather than a replacement for a teacher's knowledge and expertise.

In conclusion, the findings of the study showed that pre-service teachers used ChatGPT for two main purposes during lesson plan development: creating lesson content and deepening individual knowledge and eliminating deficiencies. According to the findings, most of the pre-service teachers stated that they benefited from ChatGPT in many ways to create lesson content. Furthermore, ChatGPT supported pre-service teachers in deepening individual knowledge and eliminating deficiencies while developing lesson plans in various ways. For these reasons, ChatGPT should be integrated into teacher education programs to prepare future teachers for AI-supported classrooms. Moreover, specific professional development opportunities should be provided to help in-service teachers use ChatGPT effectively. On the other hand, studies can be conducted to address the inappropriate implications of the use of AI in education, such as plagiarism and over-reliance on technology.

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