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Disaster literacy of prospective primary school and social studies teachers: A comparative study based on the disaster literacy scale †

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Highlights:

- Disaster literacy of prospective social studies teachers is higher than that of primary school prospective teachers.
- Disaster-related courses and activities increased prospective teachers' disaster literacy.
- Disaster literacy of prospective teachers increased as grade level increased.

Abstract

The purpose of this study is to examine the disaster literacy of prospective primary school and social studies teachers in relation to gender, department, grade level, prior disaster-related coursework, participation in disaster-related activities, and disaster experience. A descriptive survey design, a quantitative research method, was used in the study. The study group consisted of 322 prospective teachers, including 149 from the social studies education program and 173 from the primary school education program. Data were collected using the "Participant Information Form" and the "Disaster Literacy Scale." The data were analyzed using t-tests and ANOVA. In conclusion, prospective teachers' disaster literacy was above average. While no significant difference by gender was observed, those who had taken disaster-related courses and participated in disaster-related activities had higher disaster literacy. The disaster literacy of prospective social studies teachers was significantly higher than that of their primary school teaching counterparts. A significant increase in disaster literacy was also observed as prospective teachers' grade levels advanced in both programs. Additionally, prospective teachers who had experienced disasters demonstrated higher levels of disaster literacy compared to those who had not.

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1. Introduction

Disasters have always held a significant place in human history, profoundly affecting social structures and individual lives. A disaster is an event, whether natural, technological, or human-made, that disrupts or halts everyday life and human activities, leading to physical, financial, and social losses for society at large or specific groups (Disaster and Emergency Management Presidency [AFAD], 2014). Regardless of their origin, the magnitude of disasters is determined by the extent of loss of life, physical injuries, economic and emotional damage, and broader socio-economic disruptions. Contributing factors such as poverty, dense and unplanned urbanization, rapid population growth, environmental degradation, misinformation, and lack of education significantly influence the severity and outcomes of disasters. Furthermore, disasters can lead to both physical and psychological disorders, as well as inequalities in income distribution and access to social welfare (International Strategy for Disaster Reduction [UNISDR], 2009). Therefore, disaster management is essential to minimize the impacts of disasters and to ensure the effective coordination of response and recovery efforts.

Disaster management encompasses policy-making, strategic planning, administrative, financial, and legal interventions, as well as decision-making processes throughout the entire disaster cycle (Bhandari, 2014). These processes involve administrative, social, and educational activities, the promotion of volunteerism, and the effective use of social media, along with traditional print and visual media, to minimize damage (Meydan, 2019). Core principles of disaster management include identifying all potential disasters, conducting risk analyses, implementing risk management strategies, and carrying out disaster prevention activities. Disaster management also involves planning and executing response efforts. Furthermore, post-disaster recovery and reconstruction processes are designed with attention to social, psychological, and economic dimensions (Büyükbaş & Ormanoğlu, 2013). At this stage, disaster management reflects a collective societal effort to plan, coordinate, and implement measures before, during, and after a disaster. The main objectives of disaster management are to reduce or, if possible, prevent completely potential losses caused by hazards; to ensure that victims receive timely and appropriate assistance; and to facilitate rapid and sustainable recovery. For disaster management to be effective, it is essential that professionals involved in the process are knowledgeable and skilled, and that society is conscious and informed about disaster-related issues (Şengün & Küçükşen, 2019).

The disaster management process and its stages, as highlighted in various studies, can be categorized into three phases: before the disaster (risk management), during the disaster, and after the disaster (crisis management). The disaster management process consists of four successive phases: risk and loss mitigation, preparedness, response, and recovery (Dere et al., 2024). Pre-disaster activities focus on risk management through protective measures such as loss reduction and damage mitigation, preparedness, prediction, and early warning. In contrast, post-disaster activities fall under crisis management, including response, recovery, and reconstruction. Upon the occurrence of a disaster, both the main phases and the sub-phases that support them can be implemented together throughout the entire process, encompassing all stages before, during, and after the disaster (Kadıoğlu, 2008). The disaster management system plays a supporting role in helping society regulate the existing hazards when faced with a disaster. However, for this system to be effective, individuals within society must be aware of it. This is where disaster education becomes crucial.

Since governments and infrastructure alone cannot protect citizens from every disaster, disaster education has become increasingly important to ensure public safety. Individuals need to be educated on how to protect themselves and others during and after disasters, and how to implement effective response strategies (Dufty, 2020). Informing and motivating individuals to foster a culture of disaster preparedness and resilience can significantly mitigate the impacts of disasters (UNISDR, 2005). Being conscious and prepared before disasters plays a crucial role in enabling societies to prevent and minimize negative consequences (Maya & Çalışkan, 2016). Therefore, disaster education is vital for societies to respond to and recover from disasters effectively.

Disaster education is associated with several interconnected terms, as it encompasses topics such as disaster risk reduction (Petal & Izadkhah, 2008), risk education (Ronan & Johnston, 2001), disaster management (Şengün & Küçükşen, 2019), disaster-resilient societies (Mızrak, 2018), and education for disaster preparedness (Mulyasari et al., 2011). The use of various terms, such as emergency education, crisis management education, and education for natural disasters, indicates a lack of uniformity in the field (Mangione et al., 2013). Training for disaster preparedness equips individuals, communities, organizations, and governments with the knowledge and skills needed to reduce disaster risks (Mızrak, 2018). Its main goal is to equip individuals with the skills needed to understand the types, causes, and impacts of disasters,

enabling them to play an effective role in disaster prevention and mitigation (Mangione et al., 2013). One of the key skills developed through disaster education is disaster literacy.

Disaster literacy is a critical competency encompassing the skills to access, understand, evaluate, and apply disaster-related information (Çalışkan & Üner, 2022). This competency is essential for making informed decisions and following instructions in daily activities related to risk reduction, preparedness, response, and recovery, all aimed at protecting or enhancing individuals' quality of life throughout their lives. Disaster literacy is defined as an individual's knowledge and awareness of disasters, along with the ability to recognize and implement precautions to mitigate disaster risks (Güngör, 2023). The development of disaster literacy, as a key component of disaster education, begins with teachers possessing this skill. Specifically, primary school and social studies teachers are responsible for educating their students about disaster-related issues as they teach social studies and life science courses (Özer & Zenginer, 2024). This responsibility stems from the fact that these subjects include learning outcomes directly related to disaster awareness. In the 2024 Life Sciences Curriculum, the learning outcomes include: "LS.1.5.3. To be able to recognize the types of disasters," "LS.2.5.3. To be able to gather information about the measures to be taken against disasters," and "LS.3.5.3. To be able to classify actions to be taken for disaster preparedness" (Ministry of National Education [MoNE], 2024a). Similarly, the 2024 Social Studies Curriculum includes the following outcomes: "SS.4.2.3. To be able to share a product about what can be done to reduce the effects of disasters," and "SS.5.2.3. To be able to organize awareness activities to reduce the impact of disasters that may occur in their local area" (MoNE, 2024b). Since prospective teachers, who will be the educators of the future, are responsible for effectively transmitting these outcomes to students, it is equally important to provide them with the necessary training.

There are various ways for prospective teachers to prepare for disasters and emergencies. These include participating in personal activities or receiving disaster education and emergency preparedness training as part of their undergraduate programs (Yıldırım, 2024). In Turkey, the undergraduate social studies teacher education program covers disaster-related topics in compulsory courses such as "Physical Geography of Turkey" and "Disasters and Disaster Management," as well as in the elective course "Nutrition and Health" (Council of Higher Education [CoHE], 2018a). In contrast, disaster-related issues are addressed in the primary school education program solely through the elective courses "Nutrition and Health" and "Disasters and Disaster Management" (CoHE, 2018b). While compulsory courses are mandatory for all prospective teachers, elective courses are based on individual choices. Nevertheless, both prospective social studies and primary school teachers are required to possess knowledge and skills related to disasters. This situation prompted researchers to investigate the disaster literacy of prospective primary school and social studies teachers and to explore differences across undergraduate programs.

In the literature, studies conducted with prospective teachers have generally been categorized into two branches: disaster literacy and natural disaster literacy. These studies have focused on various themes and variables. For example, studies addressing deficiencies in individual and social preparedness (Güngör, 2023; Özer & Zenginer, 2024) emphasized the need for training in this area. Similarly, studies highlighting deficiencies in the behavioral dimension (Sözcü & Aydınözü, 2019; Türker & Sözcü, 2021) underscore the importance of hands-on activities. Furthermore, research exploring variables such as gender and grade level (e.g., Seven-Uygun, 2022; Yıldırım, 2024) has examined the impact of various individual characteristics on disaster literacy. Yıldırım (2024) found that male prospective special education teachers had higher natural disaster literacy than female prospective special education teachers. Güngör (2023) concluded that teacher candidates specializing in areas such as psychological counselling and guidance, primary school education, social studies, preschool education, science, and mathematics had strong geographical inquiry skills but relatively low levels of individual and social preparedness. In another study, Seven-Uygun (2022) examined perceptions of disaster awareness and disaster literacy among prospective science teachers and found significant differences across variables such as gender, grade level, and course enrollment status. Türker and Sözcü (2021), in their study of prospective geography teachers, found that while participants' disaster literacy was generally high, their behavioral dimension was at a medium level.

Yücel (2024) found deficiencies in the behavioral dimension of disaster literacy, but high affective tendencies. Kopuz (2024) examined the natural disaster literacy of prospective social studies teachers and found that their literacy differed according to variables such as their university, family preparedness, and interest in disaster news. Sözcü and Aydınözü (2019) found that prospective social studies, science, and primary school teachers' general natural disaster literacy was partially high. However, their individual behaviors remained moderate. In their study, Özer and Zenginer (2024) analyzed the disaster preparedness knowledge of prospective social studies and primary school teachers and concluded that their preparedness, both individually and socially, was insufficient. As a result of the research, although sensitivity

to natural disasters was high, deficiencies were found in the behavioral dimension. In general, these studies revealed the deficiencies and differences in disaster and natural disaster literacy across various groups of prospective teachers. Although studies in the literature involve prospective teachers from various educational programs, the variables addressed vary across studies. However, this study offers a novel contribution to the literature by incorporating a broader range of variables and focusing exclusively on prospective primary school and social studies education teachers in the study group, setting it apart from previous research.

This study aims to examine the disaster literacy of prospective primary school and social studies teachers using the Disaster Literacy Scale (DLS) in relation to selected demographic and experiential variables. In line with this aim, the main research question guiding the study is: "Do Disaster Literacy Scale (DLS) scores of prospective primary school and social studies teachers differ across selected variables?" To address this main research question, the following sub-questions were explored:

1. What are the descriptive statistics for prospective teachers' disaster literacy according to the DLS?
2. Do DLS scores of prospective teachers differ by gender?
3. Do DLS scores of prospective teachers differ by department?
4. Do DLS scores of prospective teachers differ by grade level?
5. Do DLS scores of prospective teachers differ by prior disaster-related course attendance?
6. Do DLS scores of prospective teachers differ by participation in disaster-related activities?
7. Do DLS scores of prospective teachers differ by disaster experience?

2. Method

2.1. Research Design

This study employed a descriptive survey design, a quantitative research approach used to describe existing conditions by systematically examining general tendencies, attitudes, and opinions within a given population without manipulating variables (Creswell, 2013). This design was chosen because it allows researchers to efficiently and comprehensively investigate a wide range of participant characteristics—such as knowledge, skills, attitudes, and perceptions. Moreover, survey designs enable data collection from relatively large samples, thereby strengthening the representativeness of the findings and increasing their generalizability. Therefore, a descriptive survey design was considered an appropriate and methodologically sound choice for addressing the aims of the present study.

2.2. Participants

The research sample included 322 prospective teachers in primary school and social studies education enrolled at a state university during the spring semester of the 2023-2024 academic year. Of the participants, 173 are enrolled in the primary school education program, while 149 are enrolled in the social studies education program. The convenience sampling method, one of the sampling techniques, was used in the study. Convenience sampling is commonly employed to maximize efficiency in reaching the required sample size and characteristics for the research (Büyüköztürk et al., 2020). Variables such as gender, department, grade level, prior course on disaster-related topics, participation in disaster-related activities, and disaster experience are presented in Table 1.

Table 1. Characteristics of the Prospective Teachers in terms of the Variables

Variables	Category	*f*
Gender	Female	166
	Male	156
Department	P.S.E.	173
	S.S.E.	149
Prior Course on Disaster-Related Topics	Yes	36
	No	286
Participation in Disaster-Related Activities	Yes	147
	No	175
Disaster Experience	Yes	229
	No	93
Grade Level	1st	89
	2nd	84
	3rd	85
	4th	64

P.S.E.: Primary school education, S.S.E.: Social studies education

As seen in Table 1, 166 of the prospective teachers are female, while 156 are male. Regarding the department, 173 prospective teachers are enrolled in the primary school education program, and 149 are enrolled in the social studies education program. Regarding prior courses on disaster-related topics, 36 prospective teachers have taken one, while 286 have not. Regarding participation in disaster-related activities, 147 prospective teachers participated, whereas 175 did not. Regarding disaster experience, 229 prospective teachers reported experiencing a disaster, while 93 stated they had not. By grade level, 89 prospective teachers are in their first year, 84 in their second year, 85 in their third year, and 64 in their fourth year.

2.2. Data Collection Process

Two different data collection tools were utilized in the research process. The first was the Participant Information Form developed by the researchers. This form included six items related to gender, department of education, grade level, whether the participant had taken a disaster-related course, participated in a disaster-related activity, and whether they had experienced a disaster. The second data collection tool was the Disaster Literacy Scale (DLS) developed by Çalışkan and Üner (2022). The scale consists of four sub-dimensions: mitigation (Items 1–17), preparedness (Items 18–33), response (Items 34–46), and recovery (Items 47–61), with a total of 61 items. According to the exploratory factor analysis, the scale's four-dimensional structure accounted for 61.72% of the total variance. Regarding the scale's reliability, the internal consistency coefficient was calculated as $\alpha = .954$. The Cronbach's alpha values for the sub-dimensions were $\alpha = .874$ for mitigation, $\alpha = .860$ for preparedness, $\alpha = .831$ for response, and $\alpha = .883$ for recovery. These reliability coefficients were obtained from the original scale development study conducted by Çalışkan and Üner (2022).

In the present study, in addition to the information reported in the original scale development study, the possible score ranges and theoretical mean scores for each sub-dimension and the overall scale were calculated based on the Disaster Literacy Scale's structure. The possible score ranges for the sub-dimensions are as follows: Mitigation (min = 17.00, max = 85.00), Preparedness (min = 16.00, max = 80.00), Response (min = 13.00, max = 65.00), and Recovery (min = 15.00, max = 75.00). The total score for the overall scale ranges from 61.00 to 305.00. Based on the five-point Likert-type structure of the scale, theoretical mean scores were calculated by multiplying the number of items in each dimension by the scale midpoint. Accordingly, the theoretical mean scores were determined as 51 for Mitigation, 48 for Preparedness, 39 for Response, and 45 for Recovery. The theoretical mean score for the overall scale was calculated as 183. These theoretical mean values were used as reference points to determine whether the observed mean scores for each sub-dimension and the overall scale were below or above the theoretical average.

2.3. Data Analysis

The scale-based data obtained in the study were processed and analyzed through SPSS. Independent-samples t-tests were conducted to examine differences in disaster literacy scores across gender, department, prior course on disaster-related topics, participation in disaster-related activities, and disaster experience. Additionally, a one-way analysis of variance (ANOVA) was used to examine differences in disaster literacy across grade levels. Statistics for the normality assumption are given in Table 2.

Table 2. Statistics for Normality Assumption

Sub-Dimensions	Skewness	Kurtosis
Mitigation	.-347	-1.041
Preparedness	-.255	-1.003
Response	-.265	-1.091
Recovery	-.098	-1.151
Total	-.272	-1.144

According to Table 2, the Skewness and Kurtosis values for the dataset fall within the acceptable range of ±1.5, indicating that the data are normally distributed (Tabachnick & Fidell, 2019).

2.4. Validity, Reliability, and Ethical Considerations

To ensure the reliability of the data obtained in the present study, the Disaster Literacy Scale was re-examined using data collected from the study sample. Cronbach's alpha (α) coefficient was calculated as

.982 for the overall scale. For the sub-dimensions, the reliability coefficients were α = .942 for mitigation, .932 for preparedness, .923 for response, and .940 for recovery. These values indicate that the data collected through the scale demonstrate a high level of internal consistency.

3. Findings

This section includes the findings derived from the data analysis, accompanied by relevant tables and detailed explanations. The disaster literacy of the prospective teachers was interpreted based on t-test results, and ANOVA was conducted on the scores they obtained from the sub-dimensions and the overall total of the Disaster Literacy Scale (DLS), as well as on the mean scores derived from the DLS.

3.1. Descriptive Statistics of Prospective Teachers' DLS Scores

The general descriptive statistics for prospective teachers' disaster literacy, based on their average scores, are presented in Table 3.

Table 3. Descriptive Statistics of Disaster Literacy Scale

Sub-Dimensions	n	$\bar{x}$	Std. Dev.
Mitigation	322	55.31	15.94
Preparedness	322	51.76	14.30
Response	322	42.42	12.13
Recovery	322	47.67	14.28
Total	322	197.16	54.36

As presented in Table 3, when the observed mean scores of prospective teachers are compared with the theoretical mean scores of the Disaster Literacy Scale, it is seen that prospective teachers demonstrate disaster literacy above the theoretical mean across all sub-dimensions (mitigation, preparedness, response, and recovery) as well as in the "Overall Scale".

3.2. Disaster Literacy According to Gender Variable

The t-test results regarding prospective teachers' disaster literacy based on the gender variable are presented in Table 4:

Table 4. t-Test Results of Prospective Teachers' Scores in terms of Gender Variable

Sub-Dimensions	Gender	n	$\bar{x}$	Std. Dev.	t	p
Mitigation	Female	166	56.15	15.82	.979	.328
	Male	156	54.41	16.06		
Preparedness	Female	166	52.62	14.29	1.109	.268
	Male	156	50.85	14.29		
Response	Female	166	43.03	11.93	.941	.347
	Male	156	41.76	12.34		
Recovery	Female	166	48.17	14.08	.657	.512
	Male	156	47.12	14.50		
Total	Female	166	199.98	53.79	.961	.337
	Male	156	194.16	54.97		

*p<.05

According to Table 4, when examining DLS scores, it is evident that no significant difference is observed in the Mitigation sub-dimension (p = .328), "Preparedness" sub-dimension (p = .268), "Response" sub-dimension (p = .347), "Recovery" sub-dimension (p = .512), and the "Overall Scale" (p = .337) based on the gender variable.

When the mean scores obtained by gender are compared with the theoretical mean scores of the scale, both female and male prospective teachers demonstrate disaster literacy above the theoretical mean across all sub-dimensions and in the "Overall Scale".

3.3. Disaster Literacy According to Department Variable

The t-test results regarding prospective teachers' disaster literacy based on the department variable are presented in Table 5:

Table 5. t-Test Results of Prospective Teachers' Scores in terms of Department Variable

Sub-Dimensions	Department	n	$\bar{x}$	Std. Dev.	t	p
Mitigation	SSE	149	62.09	13.69	7.69	.000*
	PSE	173	49.47	15.45		
Preparedness	SSE	149	57.05	12.53	6.55	.000*
	PSE	173	47.20	14.19		
Response	SSE	149	47.29	10.38	7.20	.000*
	PSE	173	38.21	11.98		
Recovery	SSE	149	52.77	12.69	6.31	.000*
	PSE	173	43.26	14.13		
Total	SSE	149	219.22	46.40	7.28	.000*
	PSE	173	178.16	53.64		

*p<.05

According to Table 5, when the scores of prospective teachers from the DLS are examined, a significant difference is found on behalf of prospective teachers at the social studies education across all sub-dimensions: "Mitigation" (p = .000), "Preparedness" (p = .000), "Response" (p = .000), "Recovery" (p = .000), and the "Overall Scale" (p = .000), compared with the ones studying in the primary school education department.

Table 5 shows that the scores obtained for the program variable are above the average for the dimensions and sub-dimensions of social studies teacher candidates, but below the theoretical average for the primary school teacher candidates, compared to the theoretical average scores for performance and sub-dimensions.

3.4. Disaster Literacy by Prior Disaster-Related Course Attendance

The t-test results regarding prospective teachers' disaster literacy based on the variable of taking prior courses on disaster-related topics are presented in Table 6:

Table 6. t-Test Results of Prospective Teachers' Scores in terms of Taking Prior Course on Disaster-Related Topics Variable

Sub-Dimensions	Course Taking	n	$\bar{x}$	Std. Dev.	t	p
Mitigation	Yes	36	69.77	7.32	7.699	.000*
	No	286	53.49	15.80		
Preparedness	Yes	36	65.02	8.25	6.550	.000*
	No	286	50.09	14.03		
Response	Yes	36	53.13	6.07	7.204	.000*
	No	286	41.06	12.03		
Recovery	Yes	36	61.22	8.21	6.311	.000*
	No	286	45.96	13.97		
Total	Yes	36	249.16	27.07	7.284	.000*
	No	286	190.61	53.42		

*p<.05

According to Table 6, when the scores of prospective teachers from the DLS are examined, a significant difference is found in favor of prospective teachers who took the course compared to those who did not take the course in all sub-dimensions: "Mitigation" (p = .000), "Preparedness" (p = .000), "Response" (p = .000), "Recovery" (p = .000), and the "Overall Scale" (p = .000).

According to this table, when evaluating prospective teachers who have and have not taken the disaster-related course, it is observed that those who took the course scored above average in terms of the

theoretical mean scores of the scale in general and its sub-dimensions, while those who did not take the course scored close to the average.

3.5. Disaster Literacy According to Participation in Disaster-Related Activities Variable

The t-test results regarding prospective teachers' disaster literacy based on the participation in disaster-related activities variable are presented in Table 7.

Table 7. T-Test Results of Prospective Teachers' Scores in terms of Participation in Disaster-Related Activities Variable

Sub-Dimensions	Participation	n	$\bar{x}$	Std. Dev.	t	p
Mitigation	Yes	147	59.09	15.18	3.991	.000*
	No	175	52.13	15.91		
Preparedness	Yes	147	55.09	13.53	3.916	.000*
	No	175	48.96	14.36		
Response	Yes	147	45.30	11.40	4.004	.000*
	No	175	39.99	12.22		
Recovery	Yes	147	51.20	13.78	4.176	.000*
	No	175	44.69	14.04		
Total	Yes	147	210.70	51.38	4.200	.000*
	No	175	185.79	54.32		

*p<.05

When Table 7 is examined, the DLS scores show significant differences in all sub-dimensions–"Mitigation" (p = .000), "Preparedness" (p = .000), "Response" (p = .000), "Recovery" (p = .000)–and in the "Overall Scale" (p = .000), in favor of those who participated in a disaster-related activity. This indicates that prospective teachers who took part in such activities had significantly higher disaster literacy scores than those who did not.

Furthermore, compared with the theoretical average scores of the scale (overall and sub-dimensions), the teacher candidates who participated in the activity had high scores in the "Mitigation", "Preparedness", "Response", and "Overall Scale" dimensions. However, those who did not participate in the activity scored below the theoretical average on the "Recovery" sub-dimension of the scale.

3.6. Disaster Literacy According to Disaster Experience Variable

The t-test results regarding prospective teachers' disaster literacy based on the disaster experience variable are presented in Table 8:

Table 8. T-Test Results of Prospective Teachers' Scores in terms of Disaster Experience Variable

Sub-Dimensions	Disaster Experience	n	$\bar{x}$	Std. Dev.	t	p
Mitigation	Yes	229	57.04	15.63	3.182	.002*
	No	93	50.86	15.96		
Preparedness	Yes	229	53.01	14.14	2.567	.011*
	No	93	48.52	14.29		
Response	Yes	229	43.72	11.76	3.105	.002*
	No	93	39.13	12.54		
Recovery	Yes	229	49.25	14.23	3.276	.001*
	No	93	43.56	13.63		
Total	Yes	229	203.04	53.29	3.165	.002*
	No	93	182.08	54.53		

*p<.05

According to Table 8, when the scores of the prospective teachers from the DLS are examined in relation to the variable of experiencing a disaster, significant differences were found in favor of those who had experienced a disaster in the "Mitigation" (p = .002), "Preparedness" (p = .011), "Response" (p = .002), and "Recovery" (p = .001) sub-dimensions, as well as in the "Overall Scale" (p = .002).

According to disaster experience, when comparing performance scores (general and sub-dimensions) with theoretical averages, prospective teachers who have experienced disasters score above

average in the "Mitigation," "Preparation," and "General Scale" dimensions. However, in the "Response" and "Recovery" sub-dimensions, both prospective teachers who have experienced disasters and those who may experience disasters score above the theoretical classification of performance.

3.7. Disaster Literacy According to Grade Level Variable

ANOVA results of prospective teachers' disaster literacy according to the grade level variable are presented in Table 9:

Table 9. ANOVA Results of the Mean Scores of Prospective Teachers in terms of Grade Level Variable

Sub-Dimensions	Grade Level	n	$\bar{x}$	Std. Dev.	df	F	p	Difference
Mitigation	1st	89	48.20	16.78	3/318	22.019	.000	1-3, 1-4, 2-4, 3-4
	2nd	84	52.27	14.91				
	3rd	85	57.09	14.97				
	4th	64	66.82	9.31				
	Total	322	55.31	15.94				
Preparedness	1st	89	45.75	14.08	3/318	22.199	.000	1-3, 1-4, 2-4, 3-4
	2nd	84	48.66	13.35				
	3rd	85	53.14	13.97				
	4th	64	62.35	9.53				
	Total	322	51.76	14.30				
Response	1st	89	37.42	12.72	3/318	22.188	.000	1-3, 1-4, 2-3, 2-4, 3-4
	2nd	84	39.40	11.56				
	3rd	85	43.97	11.08				
	4th	64	51.25	7.34				
	Total	322	42.41	12.13				
Recovery	1st	89	41.16	14.34	3/318	23.957	.000	1-3, 1-4, 2-4, 3-4
	2nd	84	44.80	12.54				
	3rd	85	49.18	13.61				
	4th	64	58.43	10.26				
	Total	322	47.66	14.27				
Total	1st	89	172.55	55.50	3/318	24.940	.000	1-3, 1-4, 2-4, 3-4
	2nd	84	185.15	49.99				
	3rd	85	203.40	50.94				
	4th	64	238.87	33.64				
	Total	322	197.16	54.36				

*p<.05

According to Table 9, when the scores of prospective teachers from the DLS are examined in terms of the grade level variable, a significant difference was observed in the "Mitigation", "Preparedness", "Response", "Recovery" sub-dimensions and the "Overall Scale" scores in favor of prospective teachers studying at the third and fourth grade levels, compared to those in the first-grade level. Additionally, a significant difference was found in favor of fourth-year prospective teachers compared to second- and third-year students (p = .000). Specifically, in the "Response" sub-dimension, a statistically significant difference was also found in favor of fourth-year students compared to third-year students. Furthermore, when comparing the theoretical average (overall and sub-dimensions) scores of the scale, it was found that teacher candidates from the 2nd year onwards scored above average, whereas those continuing to the 1st year scored below average.

4. Discussion and Conclusion

This study aimed to examine the disaster literacy of prospective teachers enrolled in primary school and social studies education programs, in relation to gender, department of study, grade level, enrollment in disaster-related courses, participation in disaster-related activities, and prior disaster experience. The findings revealed that the overall disaster literacy of both groups of prospective teachers was above the average. However, when examined by department, differences emerged across certain sub-dimensions and variables.

Furthermore, the results indicate a notable disparity among the sub-dimensions. Prospective teachers displayed robust competencies in preparedness, response, and recovery, whereas their

performance in the mitigation dimension was comparatively lower. This discrepancy indicates a tendency to prioritize competencies related to the impact and aftermath of disasters, rather than pre-disaster risk reduction. Collectively, these findings underscore a gap in disaster literacy training, suggesting that teacher education programs may disproportionately emphasize response and recovery at the expense of mitigation and prevention.

Regarding the gender variable, no statistically significant difference in disaster literacy was observed between prospective teachers from either program. This interpretation aligns with prior research indicating that educational and experiential factors—such as coursework, experiential learning, and firsthand experience—are more significant predictors of disaster literacy than demographic variables like gender, which is often found to be non-significant (Seven-Uygun, 2022; Sözcü & Aydınözü, 2019; Türker & Sözcü, 2021). This consistency across studies suggests that disaster literacy may be more closely associated with educational background and personal experiences rather than gender. In contrast, Yıldırım (2024) observed a difference in favor of male prospective teachers studying in special education programs, suggesting that variations in curricular content or instructional focus might play a role in this outcome.

Moreover, the results indicated that both male and female prospective teachers demonstrated above-average disaster literacy in the 'Preparedness', 'Response', and 'Recovery' sub-dimensions, as well as on the overall scale. Conversely, both groups exhibited below-average literacy in the 'Mitigation' sub-dimension. This finding suggests a potential gap in educational content regarding preventive strategies. Collectively, these results imply that teacher education programs may insufficiently emphasize risk reduction and mitigation measures compared to response-oriented competencies.

A significant difference was identified between the disaster literacy of prospective teachers based on their enrolled programs. Specifically, prospective social studies education teachers demonstrated above-average disaster literacy, while prospective primary school teachers exhibited levels below the average. This disparity may be attributed to the greater emphasis placed on disaster-related topics within the social studies education curriculum (Özer & Zenginer, 2024; Türker & Sözcü, 2021). The undergraduate curriculum for social studies education includes compulsory courses such as "Physical Geography of Turkey" and "Disasters and Disaster Management", in addition to "Nutrition and Health" (CoHE, 2018a). In contrast, the primary school education curriculum offers only elective courses related to disasters, namely "Nutrition and Health" and "Disasters and Disaster Management" (CoHE, 2018b). Since not all prospective primary school teachers are required to take these electives, this curricular distinction likely accounts for the observed difference in disaster literacy. This result emphasizes the value of structured curriculum design in promoting disaster literacy, rather than relying solely on personal interest or elective coursework. Supporting this interpretation, the study also found a statistically significant difference in disaster literacy among prospective teachers who had taken a disaster-related course. The study concluded that prospective social studies education and primary school teachers who had taken disaster-related courses demonstrated above-average disaster literacy across all sub-dimensions compared to those who had not. This finding highlights the critical role of education in enhancing disaster literacy. The significantly higher disaster literacy observed among prospective teachers who completed disaster-related coursework underscores the effectiveness of formal instruction in this area. This result aligns with previous research emphasizing the importance of disaster education in fostering preparedness and awareness (Seven-Uygun, 2022; Sözcü & Aydınözü, 2019).

A significant difference was observed in prospective teachers' disaster literacy levels regarding their participation in disaster-related activities. When comparing the disaster literacy of participants in such activities with that of non-participants, participants exhibited above-average disaster literacy across all sub-dimensions—"Mitigation," "Preparedness," "Response," and "Recovery"—and in the overall scale. In contrast, prospective teachers who had not participated in disaster-related activities demonstrated below-average literacy in the "Mitigation" and "Recovery" sub-dimensions. Additionally, when the variable of disaster experience was examined, prospective teachers who had experienced a disaster scored above average in the "Preparedness," "Response," and "Recovery" sub-dimensions, as well as on the overall scale, except for the "Mitigation" sub-dimension. Conversely, those who had not experienced a disaster displayed below-average disaster literacy in all sub-dimensions except for "Preparedness" and "Response," and in the overall scale. These findings suggest that personal experience plays a critical role in shaping disaster awareness and literacy. This conclusion is consistent with the results reported by Kopuz (2024) and Yıldırım (2024).

Finally, it was observed that as the grade level of both prospective social studies and primary school teachers increased, their disaster literacy improved from below average to above average. This upward trend suggests that increasing age and accumulated educational experiences significantly contribute to the development of individuals' disaster awareness. While Özer and Zenginer (2024) reported that grade level

did not affect natural disaster literacy, the findings of Seven-Uygun (2022) and Sözcü (2019) support the view that disaster awareness increases with grade level.

Limitations and directions for future research

Although the inclusion of only prospective primary school and social studies teachers in the sample is a limitation of the study, it also constitutes a strength, given that individuals in these fields are likely to teach disaster-related content in their professional careers. Another limitation of the study is its exclusive reliance on quantitative methods. Future research employing qualitative approaches could provide a deeper understanding of prospective teachers' disaster literacy. In light of the findings, there is a clear need to bolster disaster education within teacher training programs. Specifically, the lower scores of prospective primary school teachers compared to those of social studies candidates highlight the need to add compulsory disaster-related courses to the primary education curriculum. Moreover, the positive impact of coursework and extracurricular participation suggests that curricula should integrate theoretical knowledge with experiential learning, such as drills and simulations. The correlation between grade level and literacy scores further supports a longitudinal approach to disaster education, systematically reinforcing it throughout the undergraduate program. Collectively, these strategies are essential for training a generation of teachers capable of effectively managing disaster risks and responding to disasters.

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