

Participatory Educational Research (PER)  
Vol.13(2), pp. 165-187, March 2026  
Available online at <http://www.perjournal.com>  
ISSN: 2148-6123  
<http://dx.doi.org/10.17275/per.26.24.13.2>

Id: 1765475

## Investigation of Social and Cultural Informal Learning Opportunities for Middle and High School Students

Tufan İNALTEKİN\*

*Department of Mathematics and Science Education, Kafkas University, Kars, Türkiye*  
ORCID: 0000-0002-3843-7393

Ataman KARAÇÖP

*Department of Mathematics and Science Education, Kafkas University, Kars, Türkiye*  
ORCID: 0000-0001-8939-3725

Hakan AKÇAY

*Department of Mathematics and Science Education, Bogazici University, İstanbul, Türkiye*  
ORCID: 0000-0003-0307-661X

---

### Article history

#### Received:

14.08.2025

#### Received in revised form:

19.11.2025

#### Accepted:

23.11.2025

### Key words:

social and cultural informal learning; middle and high school students; disadvantaged regions

This study aims to investigate the social and cultural informal learning opportunities of middle and high school students based on gender, grade level, and place of residence. The sample consists of 1,310 students from a province located in eastern Türkiye. Data were collected through three items concerning personal information and two special multiple-response items in the Informal Learning Opportunities Test (ILOT). The data were analyzed using multiple response analysis and the chi-square test of independence. The results indicated that gender did not significantly influence students' camp preferences; however, it had a significant effect on their activity preferences. Both boy and girl students exhibited low participation in science camps, yet girl students tended to prefer social, cultural, and nature-based activities, while boy students favored physical or technical activities. Participation in STEM-related activities was low for both genders. Grade level did not significantly affect camp preferences but showed a significant influence on activity preferences. Upper-grade students were more open to a variety of camp experiences, whereas 10th-grade students demonstrated limited participation. Younger students (5th and 6th graders) preferred entertainment-oriented visits, 7th graders were more inclined toward science and cultural trips, and older students (9th and 10th graders) tended to engage in vocational visits. Moreover, significant differences were found in both camp and activity preferences according to place of residence. Students from city and district areas participated in camps more frequently than those from villages or metropolitan regions. While village and district students preferred nature-based activities, city students showed a greater inclination toward cultural activities.

---

\* Correspondency: [inaltekitufan@gmail.com](mailto:inaltekitufan@gmail.com)

## **Introduction**

Education encompasses not only the structured learning processes that occur within schools but also the diverse learning experiences that take place beyond the classroom, in everyday life. In this context, social and cultural experiences are among the most significant sources of out-of-school learning (Miles et al., 2018; Rogoff et al., 2016). Informal learning that occurs in social and cultural contexts plays a critical role in individual development (Pesch et al., 2025). Such learning arises through interactions within families, communities, peer groups, and various informal environments (Bourke et al., 2024). A wide range of social and cultural informal learning opportunities outside of school contribute to the development of students' essential life skills (Lewin & Charania, 2018; Nygren et al., 2019). These opportunities enhance individuals' social relationships, increase cultural awareness, and strengthen their sense of social belonging (Chuang, 2021). Through participation in these experiences, students gain a variety of skills and engage more actively in community life (Moreland, 2019; Roberts et al., 2018). This is especially important for middle and high school students, who are in a developmental stage characterized by identity formation. The social and cultural environments they are exposed to outside of school can have a profound impact on their cognitive, emotional, and social development (Maiorca et al., 2021; Sahin et al., 2015). During adolescence, participation in social and cultural activities such as visits to scientific, artistic, and historical sites and events, or involvement in various camps provides significant learning outcomes that support students' holistic development (Bonnette et al., 2019; Djonko-Moore et al., 2018; Dou et al., 2019; Ghadiri Khanaposhtani et al., 2018).

Socio-demographic differences constitute a fundamental variable that directly affects students' access to informal learning opportunities (Nygren et al., 2019). Various factors such as gender, socio-economic status, region of residence (rural/urban), parents' educational background, and cultural capital differentiate students' opportunities to access out-of-school learning environments (Akram, 2024; Shah et al., 2025; Ye, 2018). At this point, educational equity is closely related to the extent to which students can access both formal and informal learning resources (Simbo, 2025). The fact that learning resources are available only to a specific group, or that access is restricted due to economic, geographical, or cultural reasons, exacerbates inequalities in learning opportunities (Sapulette & Ritiauw, 2025). Therefore, educational equity can only be achieved not merely through formal education, but also through the fair and inclusive provision of informal learning opportunities (Adams, 2020). Ensuring that informal learning resources are accessible and inclusive for all socio-demographic groups plays a reinforcing role in strengthening equal opportunities in education (Nygren et al., 2019). Otherwise, socio-demographic differences deepen the learning gap among students and reinforce inequalities (Low & Kalender, 2024). In terms of gender, due to social roles and usage habits, male and female students may differ in their ways of accessing and benefiting from learning resources (Kollmayer et al., 2018). It can also be argued that as the grade level increases, students are able to use informal learning resources in a more conscious and diversified manner (DeWitt & Archer, 2017). With respect to place of residence, while students living in urban areas have easier access to libraries, museums, science centers, and digital resources, those living in rural areas are often compelled to continue their learning process with more limited resources (Buck et al., 2023). Thus, socio-demographic differences today deepen inequalities in access to informal learning opportunities and can constitute a significant barrier to achieving equity in education.

Middle and high school years represent a critical developmental period during which students' knowledge and skills are rapidly shaped and enhanced through social and cultural



activities (DeWitt & Archer, 2017; Stevens et al., 2016). The social and cultural experiences gained during this stage not only support formal learning but also play a key role in shaping students' interests, increasing awareness of social roles, and contributing to identity formation (Habig et al., 2020; Riedinger, 2015; Todd & Zvoch, 2019). However, access to such learning opportunities may not be equally available to all students. Socio-demographic variables such as gender, grade level, and place of residence can significantly influence students' access to and engagement with informal learning environments. These factors may act as facilitators or barriers to participation in valuable out-of-school learning experiences. Therefore, identifying how social and cultural informal learning opportunities differ according to these variables is essential for developing more inclusive and equitable educational policies. Understanding the extent to which student participation in such learning experiences varies across demographic groups can help shape educational practices that promote equity and inclusion in learning opportunities beyond the classroom.

### ***The Importance of Social and Cultural Informal Learning Opportunities for Middle and High School Students***

Social and cultural informal learning is a natural part of an individual's process of making sense of the world. While it is sometimes perceived as a meaningful and intentional process, at other times it may appear trivial or incidental. Typically lacking a formal structure, organization, or external support, such learning is still valuable in terms of how individuals interpret their experiences and derive meaning from them (Starr-Glass, 2015). For middle and high school students, social and cultural informal learning opportunities not only support academic achievement but also offer essential experiences for developing personal and social skills (Kumari et al., 2024; Lenard & Silliman, 2025). Through these learning experiences, adolescents begin to shape their identities and explore their personal interests (Gerber et al., 2001). Thus, social and cultural informal learning during this stage becomes a vital dimension of students' individual development (Rogoff et al., 2016). These opportunities significantly contribute to the development of social skills (Johnson & Majewska, 2022), acquisition of cultural awareness (Jones et al., 2025), sense of social belonging (Houston, 2023; Wang & Hofkens, 2020), self-confidence and responsibility (Ballane, 2019; Perets et al., 2023; Salleh et al., 2021), and career awareness (Balçın & Topaloğlu, 2019; Maiorca et al., 2021). Adolescence is a period marked by accelerated personal growth. Social and cultural informal learning opportunities during middle and high school years do not merely contribute to academic success; they also strengthen students' sense of direction and purpose in life. Additionally, they provide cognitive stimulation, social interaction, and motivation (Jeong et al., 2018).

### ***The purpose of the research***

In the literature, the number of studies addressing social and cultural informal learning opportunities of middle and high school students in relation to socio-demographic variables such as gender, grade level, and place of residence is quite limited (Gerber et al., 2001; Tisza et al., 2019). Existing research tends to focus on specific types of activities and does not comprehensively analyze informal learning opportunities based on these student characteristics. This limitation hinders a thorough understanding of students' access to and participation in social and cultural informal learning environments within this age group. Furthermore, the lack of knowledge in this area continues to impede the development of educational policies that are responsive to students' needs. Therefore, studies conducted in this field will contribute to filling an important gap in the literature.

In this context, the present study aims to identify how middle and high school students

participate in social and cultural informal learning opportunities according to their gender, grade level, and place of residence. The guiding research questions of the study are as follows:

- (1) Which summer and youth camps do middle and high school students attend according to their gender, grade level, and place of residence?
- (2) Which informal learning environments do middle and high school students visit with interest and which activities do they participate in, based on their gender, grade level, and place of residence?
- (3) Do middle and high school students' participation in summer and youth camps within the scope of informal learning differ according to their gender, grade level, and place of residence?
- (4) Do middle and high school students' visit to places and participation in activities within the scope of informal learning differ according to their gender, grade level, and place of residence?

## **Method**

### ***Research Design***

This study is designed as a quantitative descriptive survey based on quantitative research methods, aiming to reveal how the camps attended and informal learning environments visited by middle and high school students differ in terms of gender, grade level, and place of residence. The dependent variable in the study is the level of student participation in informal learning opportunities. The independent variables are defined as students' gender (girl/boy), grade level (5th-10th grade), and place of residence (village, district, city, metropolitan). Through this design, students' levels of participation in informal learning opportunities were compared according to their demographic characteristics, and it was examined whether the variables constituted a significant difference.

### ***Sample***

This study was conducted in public schools located in the central districts and seven counties of a province in eastern Turkey, which has a total population of approximately 278,000 and a surface area of 9,442 km<sup>2</sup>. The province in which the research was conducted is a region distinguished by its rich cultural heritage and traditional elements. Folk literature, local dances, and regional festivals constitute significant factors that enrich the city's cultural and artistic life. In addition, seasonal religious camp activities organized by the provincial directorate of religious affairs and youth institutions are common among young people. However, compared to other regions, the number of local cultural and artistic events remains relatively limited. In terms of educational infrastructure, the province hosts one city museum with a focus on archaeology and ethnography, one science and art center, one youth center, one history museum, one cultural museum, one public library, as well as libraries affiliated with schools. Moreover, the province can be considered an open-air museum with respect to its numerous historical monuments, and it is home to one of Turkey's most prominent archaeological sites. Alongside its cultural assets, the province also features extensive forests, plateaus, nature conservation areas, and lakes, offering a rich biodiversity. Despite its cultural and natural richness, the province is among the less developed regions of Turkey and is considered socio-economically disadvantaged (URL 1). The local economy relies largely on agriculture and livestock farming, with limited employment opportunities in the industrial

sector. Consequently, the region is characterized by restricted economic infrastructure, income levels, and labor opportunities. Geographically, the province faces challenging winter conditions, including heavy snowfall, blizzards, and high-altitude barriers. In rural areas, road closures during winter are common, making it difficult for students to access district or city centers. This situation complicates students' attendance at schools or participation in various activities. As a result, many students living in rural areas tend to prefer boarding schools. The sample was selected using the stratified cluster random sampling method, one of the probabilistic sampling techniques. In the first stage of sampling, strata were formed based on the provincial center, central villages, and the seven counties. From each stratum, at least one middle school and one high school were randomly selected, proportionally to the total number of schools in that stratum. Within the selected middle schools, students were divided into four strata based on grade level (5th, 6th, 7th, and 8th grades), and high schools were divided into two strata (9th and 10th grades). From each school, at least one class section per grade level was included in the sample, taking into account the number of students and class branches.

In this study, data were obtained from a project conducted as part of a scale development study. The scale development process was carried out in two phases. In the first phase, the Informal Learning Opportunities Test (ILOT) was developed based on the theoretical framework of informal learning and existing measurement instruments in the literature with similar objectives. The test was administered to 2,000 students in grades 5 to 10 from selected schools, and data were collected from a total of 1,224 students (~61%). In the second phase of the study, the ILOT developed in the first phase was administered to another 2,000 students in grades 5 to 10 from schools that had not participated in the initial implementation. In this phase, data were collected from 1,312 students (~66%). For the purposes of the present study, data obtained from 1,310 students in the second phase of the project were included in the analysis. The discrepancy between the target sample and the actual number of participants in both phases resulted from non-participation, which was based on the research participation process, parental consent, and voluntary participation. In the second phase, two datasets were excluded due to incomplete responses, and thus, statistical analyses were carried out with data from 1,310 students. Despite the voluntary non-participation of some students, data were collected from each selected school and grade level within the participating settlements. More than half of the participants were female (55.8%). The distribution across grade levels was relatively balanced, with rates ranging between 16% and 17.5%. About three-quarters (73%) of the students reported spending most of their lives in districts and villages.

### ***Data Collection***

In both phases of the study, printed test forms were delivered face-to-face to students selected from schools located in the provincial center, districts, and villages. In the second phase, the final version of the ILOT was administered face-to-face to students in the sample, excluding those from schools that had participated in the first implementation. The data collection process was carried out on a voluntary basis and with parental consent, whereby students completed the ILOT outside of class hours and submitted it to the researchers. As the data collection instrument, the ILOT, developed by the researchers based on Gerber et al.'s Informal Learning Opportunities Assay (2001), was employed. In developing the ILOT, the theoretical framework of informal learning, informal learning scales from the literature, current societal conditions, the Turkish cultural context, opportunities provided by the state to children and youth, as well as the structures of public institutions and non-governmental organizations, were all considered in the item development process. The draft ILOT consisted of 44 items in total: 42 items in multiple-choice (single-response and multiple-response),

yes/no, and fill-in-the-blank formats, along with 2 open-ended items. The items of the ILOT were designed to encompass dimensions such as “social activities with family and/or friends”, “individual activities”, “school-related activities”, “non-school courses”, “group activities”, “work and daily household tasks”, “travel and visits”, “general activities”, and “technology-based social participation”. The draft version of the ILOT, prepared by researchers specialized in science education, was reviewed for content validity by two science teachers. The experts agreed that the ILOT was appropriately structured for students in grades 5–10 and comprehensively assessed their informal learning opportunities. Following administration, statistical analyses were conducted to examine the psychometric properties of the test. An exploratory factor analysis (EFA) was performed to determine construct validity. The Kaiser-Meyer-Olkin (KMO) value of .74 and the result of Bartlett’s Test of Sphericity ( $\chi^2 = 4470.256$ ,  $p = .000$ ) confirmed the adequacy of the sample and the suitability of the data for factor analysis. Principal components analysis revealed that the scale items were grouped under seven factors with eigenvalues greater than 1, accounting for approximately 42% of the total variance. In multidimensional scales, this level of explained variance is considered sufficient in social sciences. The scree plot further supported the seven-factor solution, and a loading threshold of .32 was adopted. Thirty items met this criterion.

In the second phase of scale development, the 30-item ILOT was administered to students from schools not included in the first implementation. Confirmatory factor analysis (CFA) was then conducted on the second-phase data. Five items that did not meet the .32 factor loading threshold were removed, resulting in the finalized 25-item version of the ILOT. The factors and their corresponding factor loadings were as follows: (F1) Social media use (.68–.79); (F2) Time spent on shopping and leisure activities (.48–.72); (F3) Leisure activities (.59–.76); (F4) Technology use, hobbies, travel, and engaging activities (.48–.65); (F5) Educational, cultural, and sports activities (school-related and non-school-related) (.44–.77); (F6) Library and research activities (.78–.81); and (F7) Activities requiring independent decision-making (.53–.79). Reliability analysis indicated item-total correlations ranging from .17 to .50, and Cronbach’s alpha for the 25-item scale was calculated as .75. The reliability coefficients for the seven factors were .73, .66, .68, .65, .64, .64, and .61, respectively. While the relatively low values for some factors may be attributed to the limited number of items, such results are considered acceptable in multidimensional scales (Pallant, 2010). Therefore, reporting item-total correlations is recommended. In this case, item-total correlations for the 25 items ranged from .17 to .50. CFA results confirmed the seven-factor structure of the 25-item ILOT. Among six fit indices examined, three indicated good fit and three indicated acceptable fit. The  $\chi^2/df$  ratio was 4.76, suggesting an acceptable level of fit. Other indices were as follows: RMSEA = .05 (good fit), CFI = .90 (acceptable), IFI = .90 (acceptable), GFI = .92 (good fit), and AGFI = .90 (good fit). Error variances for the observed variables ranged from .33 to .89, indicating adequacy for the model. The t-values for the factor loadings were also significant: 20.03–28.32 for F1, 8.79–12.95 for F2, 9.89–10.14 for F3, 6.58–7.01 for F4, 8.44–9.07 for F5, 7.09 for F6, and 3.90 for F7. These results demonstrate that all observed variables adequately represented their latent constructs, and no items required removal from the model.

The scoring of students’ responses to the ILOT items was based on the structure of each item. For all dichotomous items, “yes” responses were scored as 1 and “no” responses as 0. Some items included four blank spaces in which students who answered “yes” could specify the activities they engaged in; in these cases, a “no” response was scored as 0, a “yes” response as 1, and an additional 1 point was assigned for each valid activity reported. Other items

contained more than five response options, allowing students to indicate their participation in listed activities; in these items, “no” was scored as 0, while “yes” responses were scored from 1 to 5 depending on the number of activities selected. Certain items required students to report the amount of time spent or the frequency of participation in activities using three-, four-, or five-point response formats; these were scored on a scale of 0–4, with 0 representing the minimum time/frequency and higher points assigned to increasing levels of engagement. In one item, additional points (1–5) were awarded based on the number of purposes marked. Some items assessed with whom the students spent their time, offering two options; “with adults” was scored as 0 and “alone” as 1. For items with more than five listed activity options, no response was scored as 0, and the number of selected options was scored from 1 to 5.

For the purposes of this study, data obtained from 1,310 students on two multiple-response items of the ILOT were analyzed. The students’ responses to these items were subjected to option analysis. The items included: “Have you ever participated in summer camps or youth camps? (12 options listed)” and “Please mark (X) all the places you have visited or interesting activities you have participated in so far (24 options listed)”. In addition, the second implementation of the ILOT included demographic items addressing participants’ gender, grade level, and place of residence. The data were analyzed to determine whether students’ responses to the two multiple-response items varied according to their demographic characteristics.

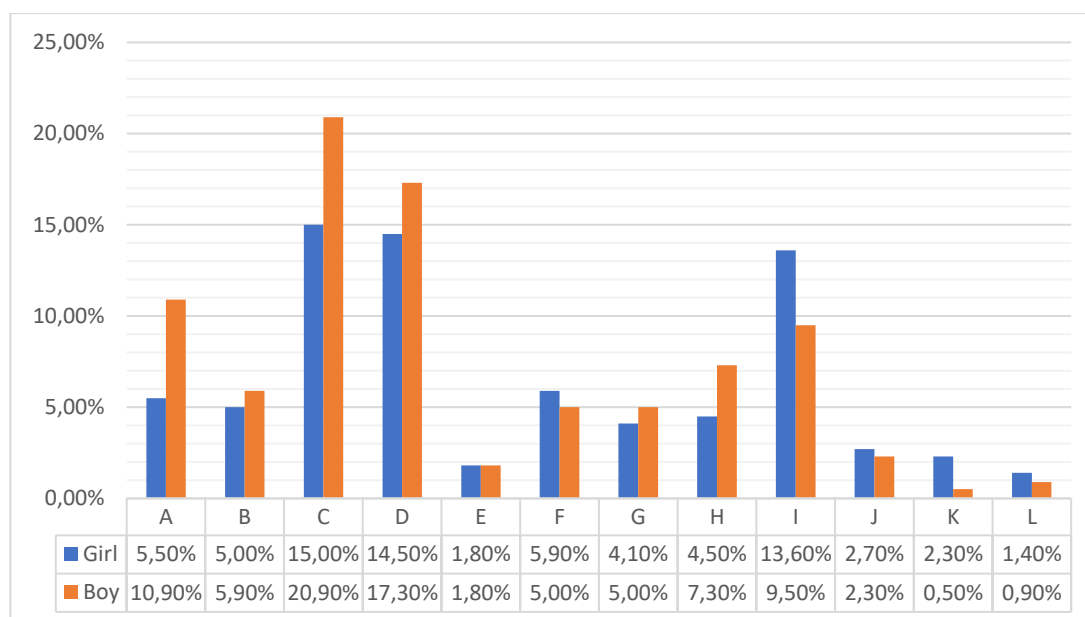
### ***Data Analysis***

Descriptive statistics were calculated using multiple response analysis in SPSS based on the data obtained from the study. These statistics included percentage values of students’ multiple responses to each question, analyzed in relation to the independent variables of gender, grade level, and the place where they have spent the majority of their lives. The results from the analysis were presented in the form of graphs. Middle school and high school students’ participation in summer and youth camps, as well as the places they visited and the activities they participated in, were analyzed using the chi-square independence test for two categorical variables to determine whether they differed according to gender, grade level, and place of residence.

## **Results**

### ***Results on Students’ Participation in Camps***

Among the students in the research sample, the proportion of those who responded to the item regarding their participation in summer and youth camps was 16.8% (n = 220, total participants = 1310). In this multiple-response item, the listed options were selected a total of 360 times. The distribution of responses among the 220 participants was presented in figures according to gender, grade level, and place of residence. The results showing the distribution of camps attended by middle and high school students based on gender are presented in Figure 1.

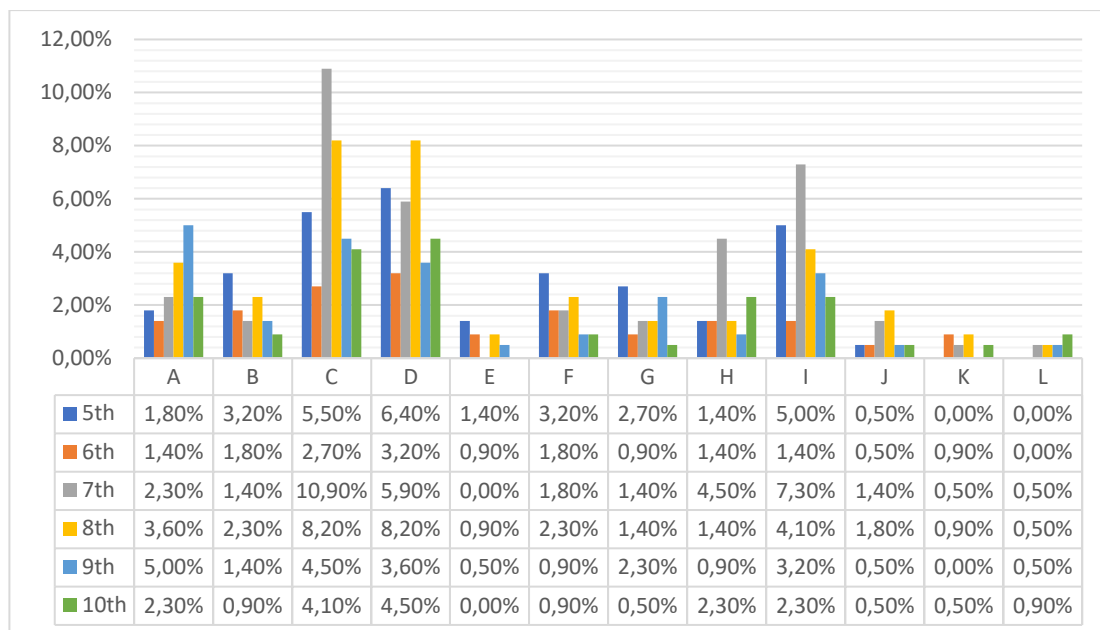


Not: Horse Riding (A), Archery (B), Sports Camps (C), Swimming (D); Astronomy, Aviation, and Sky Observation Camps (E); Intelligence Games Camp (F); Trekking (G); Religious Education Camps (H); Folk Games (I); Mathematics and Science Camps (J); STEM, Robotics Coding, and Science Workshops (K); Art and Literature Camps (L)

Figure 1. Distribution of summer and youth camps attended by middle and high school students within the scope of informal learning, by gender

Figure 1 illustrates the gender-based differences in students' participation in summer and youth camps. According to the results, boy students participated more frequently in sports camps (20.9%) and swimming camps (17.3%) compared to girl students. This pattern may stem from societal tendencies to encourage boys towards physical and competitive activities. Conversely, the participation rate of girl students in folk dance camps (13.6%) was notably higher than that of boy students (9.5%). This result highlights the influence of gender norms on students' preferences for cultural and artistic activities. The greater inclination of girl students towards activities that nurture cultural identity can be explained by both familial and societal guidance. While girls tend to gravitate more towards artistic and social domains, boys appear to prefer physical and technical fields. Participation in STEM, robotics, and scientific workshop camps was low among both girls (2.3%) and boys (0.5%), indicating a significant gap in making these areas appealing to all genders.

The results showing the distribution of camps attended by middle and high school students according to their grade level are presented in Figure 2.

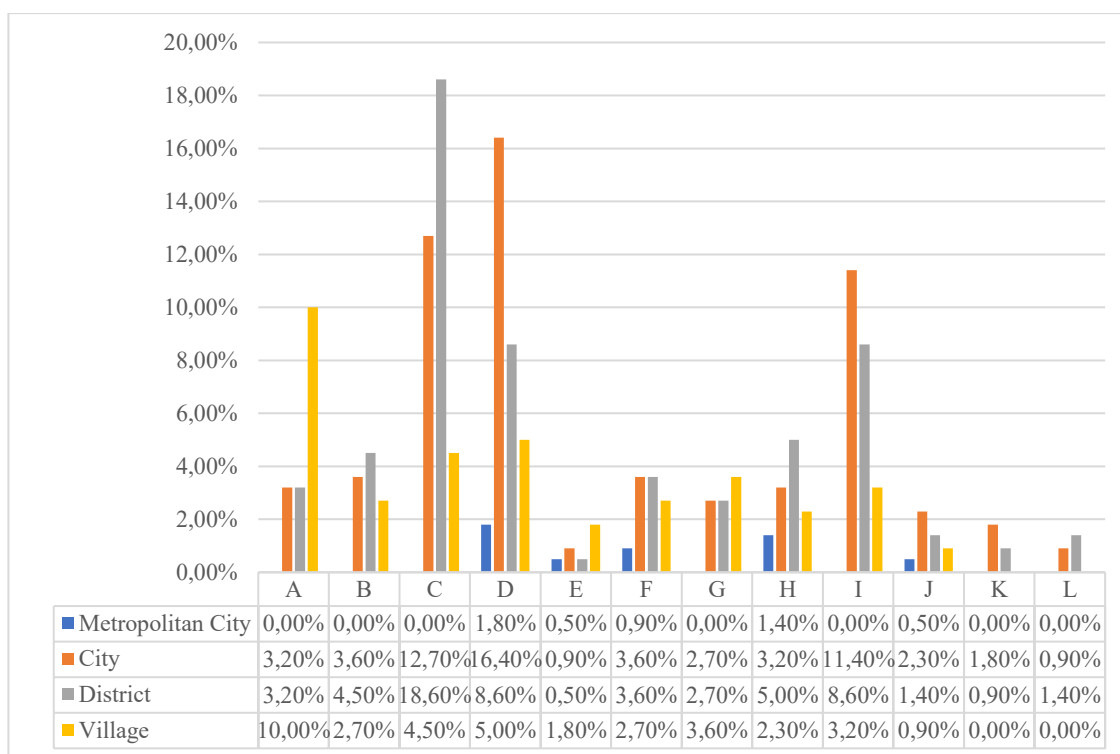


Not: Horse Riding (A), Archery (B), Sports Camps (C), Swimming (D); Astronomy, Aviation, and Sky Observation Camps (E); Intelligence Games Camp (F); Trekking (G); Religious Education Camps (H); Folk Games (I); Mathematics and Science Camps (J); STEM, Robotics Coding, and Science Workshops (K); Art and Literature Camps (L)

Figure 2. Distribution of summer and youth camps attended by middle and high school students within the scope of informal learning, by grade level

Figure 2, which illustrates the camp participation rates by grade level, shows that the highest participation was among 7th-grade students (37.9%). This suggests that students in the upper levels of middle school are more open both physically and cognitively to trying different activities. During this period of accelerated social development, students’ desire to explore themselves, work in groups, and enhance communication skills directs them more towards informal learning environments. The low participation rate of 10th-grade students (19.7%) can be attributed to the academic pressure associated with exam preparation at the high school level, where students often spend their summer engaged in study sessions, courses, or similar activities. The distribution according to grade level also indicates that middle school students tend to prefer entertainment and cultural activities, whereas high school students are more involved in academic and career-oriented events. This reflects a developmental progression where, as students grow older, they gravitate towards more structured, cognitively demanding, and goal-oriented learning activities. Moreover, with increasing age, students’ preferences become more specialized and future-focused, indicating that informal learning follows a developmental trajectory.

The analysis results showing the distribution of camps attended by middle and high school students according to the places where they have spent most of their lives are presented in Figure 3.



Not: Horse Riding (A), Archery (B), Sports Camps (C), Swimming (D); Astronomy, Aviation, and Sky Observation Camps (E); Intelligence Games Camp (F); Trekking (G); Religious Education Camps (H); Folk Games (I); Mathematics and Science Camps (J); STEM, Robotics Coding, and Science Workshops (K); Art and Literature Camps (L)

Figure 3. Distribution of summer and youth camps attended by middle and high school students within the scope of informal learning, by place where they have spent the majority of their lives

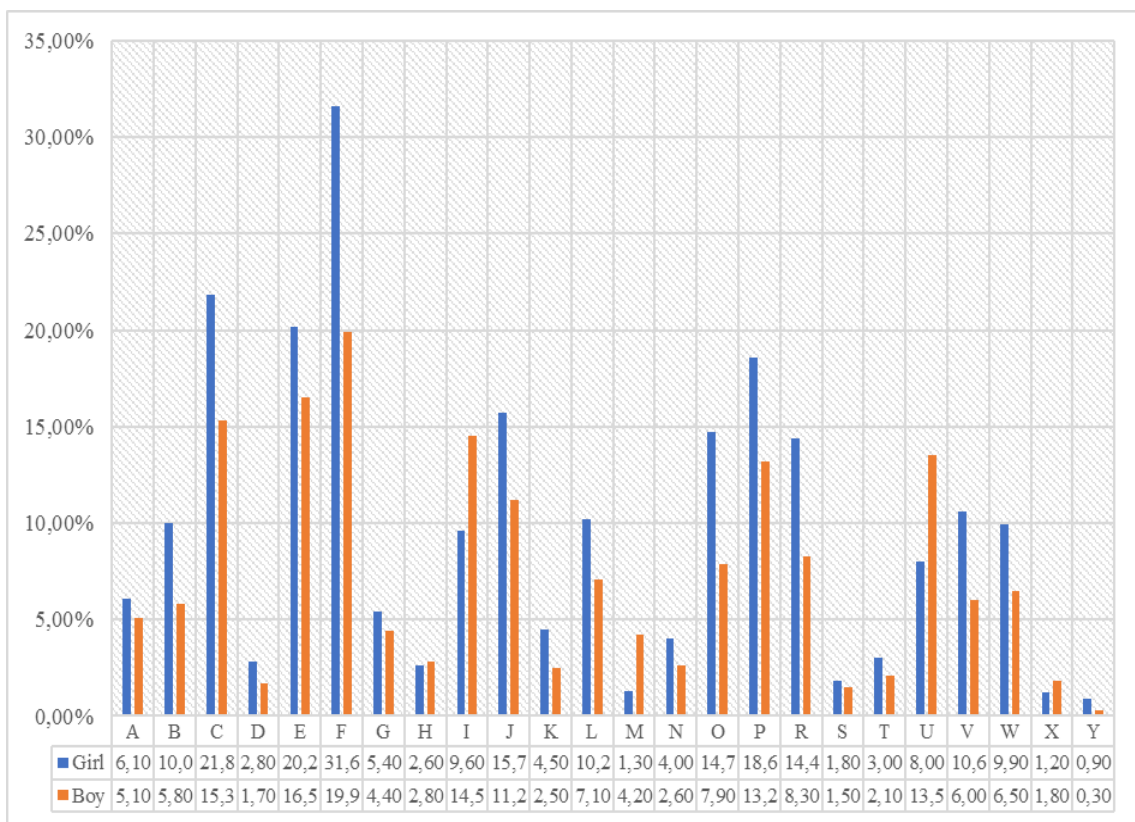
Figure 3 presents the analysis results based on students' places of residence, revealing that participation rates in camps are higher among students living in cities (62.7%) and district centers (59%) compared to those residing in villages (36.7%) and metropolitan areas (5.1%). Preferences for types of camps also vary significantly depending on where students have spent most of their lives. Notably, the low participation of students living in metropolitan areas is striking. This may be related to families in metropolitan regions directing their children towards academic support activities during the summer, such as private tutoring, study sessions, and summer courses. Students from villages show a higher engagement in nature-based activities, such as horseback riding (10.0%) and trekking (3.6%), indicating how environmental and cultural factors shape their preferences. At the same time, the easier access to various types of camps for students living in cities and district centers can be explained by better transportation and organizational infrastructure in these areas. These results demonstrate that students' living environments influence the types of activities they can access and their interests.

The analysis examined whether middle school and high school students' participation in summer and youth camps within the scope of informal learning differed by gender, grade level, and place of residence using a chi-square independence test for two categorical variables. According to the chi-square test results, there was no significant difference between girls and boys in terms of their participation in summer and youth camps within the scope of

informal learning,  $X^2=14.627$ ,  $p=0.262$ . A similar result emerged for the participants' grade levels,  $X^2=70.353$ ,  $p=0.170$ . Conversely, it was found that the summer and youth camps attended by participants within the scope of informal learning differed significantly according to their place of residence (city, district, village),  $X^2=85.221$ ,  $p=0.001$ .

**Results on Places Visited and Activities Participated in with Interest by Students**

Regarding the item designed to identify the types of places visited and interesting activities attended by students, 85.6% of the participants provided responses (n = 1121, total participants = 1310). In this multiple-response item, the 24 listed options were selected a total of 4,523 times. The distribution of responses among the 1121 participants was also presented in figures according to gender, grade level, and place of residence. The analysis results showing the distribution of places visited and activities participated in with interest by middle and high school students, according to gender, are presented in Figure 4.



Not: Science Festivals (A); Art Museum (B); History Museum (C); Botanical Garden (D); Plateau (E); Amusement Park (F); Archaeology Museum (G); Science Chat Cafes (H); Agricultural Fields and Greenhouses (I); Ancient Cities & Historical Buildings (J) ; Art Galleries & Workshops (K); Health Institutions & Organizations (L); Industrial Establishments & Factories (M); Nature Education & Nature Schools (N); Zoo & Aquarium (O); Forests, Rivers & Lakes (P); National Park (R); Sky Observation & Planetariums (S); Science Centers, STEM & Robotics Coding Workshops (T); Sports Competitions (U); Fairs or Festivals (V); Canyons, Waterfalls, Caves & Volcanoes (W); Renewable Energy Production Centers (X); Other (Y)

Figure 4. Distribution of places visited and activities participated in by middle and high school students within the scope of informal learning, by gender

The analysis results in Figure 4 based on gender reveal that girl students show a higher



interest in social, cultural, and nature-oriented venues such as history museums, art museums, healthcare institutions, and zoos. In contrast, boy students tend to gravitate towards physically or technically oriented activities, including industrial facilities, agricultural fields, and sports competitions. The similarly low participation rates in STEM-focused activities across genders indicate significant shortcomings in making these areas appealing to students. Gender not only influences students' interests but also the nature of the learning environments they access. Accordingly, girls tend to prefer artistic activities, whereas boys are more inclined towards technical events. In this context, notable gender-based differences exist in the types of places students visit.

The analysis results showing the distribution of places visited and activities participated in with interest by middle and high school students, according to grade level, are presented in Figure 5.



Not: Science Festivals (A); Art Museum (B); History Museum (C); Botanical Garden (D); Plateau (E); Amusement Park (F); Archaeology Museum (G); Science Chat Cafes (H); Agricultural Fields

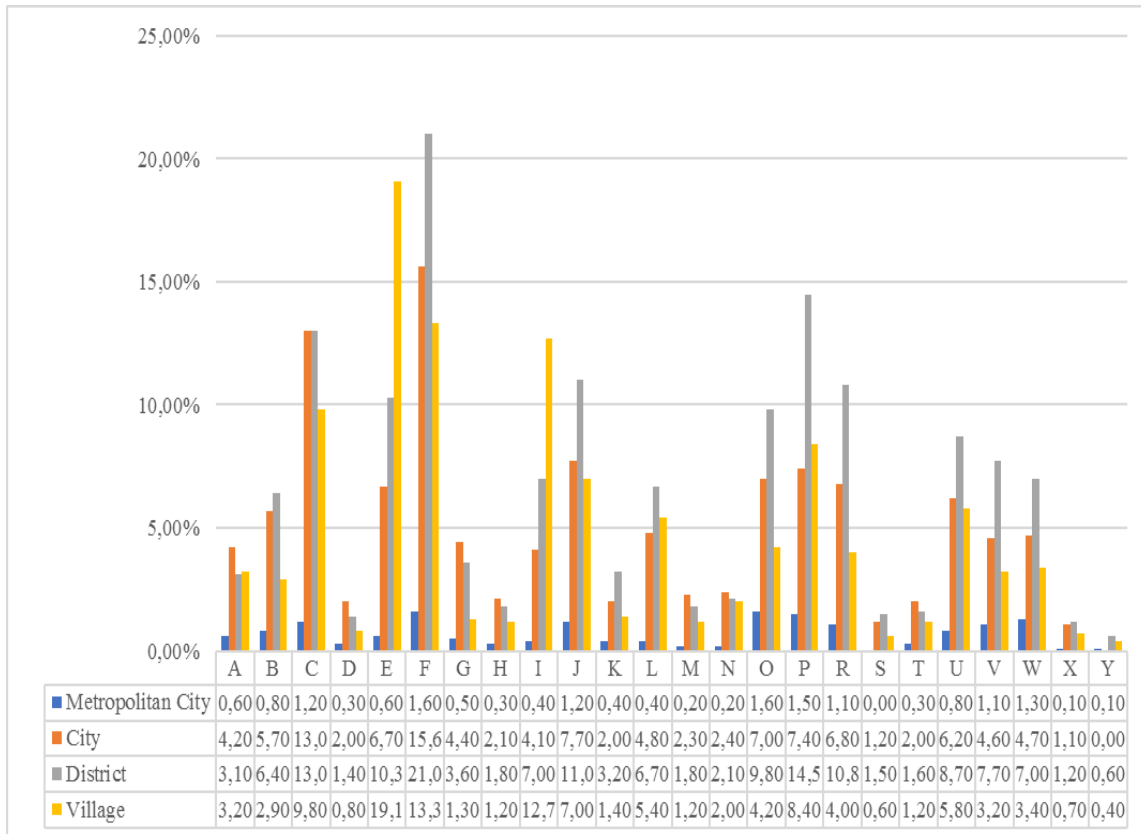


and Greenhouses (I); Ancient Cities & Historical Buildings (J) ; Art Galleries & Workshops (K); Health Institutions & Organizations (L); Industrial Establishments & Factories (M); Nature Education & Nature Schools (N); Zoo & Aquarium (O); Forests, Rivers & Lakes (P); National Park (R); Sky Observation & Planetariums (S); Science Centers, STEM & Robotics Coding Workshops (T); Sports Competitions (U); Fairs or Festivals (V); Canyons, Waterfalls, Caves & Volcanoes (W); Renewable Energy Production Centers (X); Other (Y)

Figure 5. Distribution of places visited and activities participated in by middle and high school students within the scope of informal learning, by grade level

The results presented in Figure 5 illustrate the distribution of places visited and activities participated in by middle and high school students within the scope of informal learning according to grade level. The results show that 7th-grade students stand out in nature trips, visits to history museums, and ancient cities, whereas lower grades (5th and 6th) tend to prefer amusement-oriented venues such as theme parks. It is noteworthy that upper-grade students (9th and 10th grades) prefer activities that promote career awareness, such as visits to healthcare institutions and industrial facilities. While middle school students mostly visit entertainment-based and hands-on experience venues, high school students tend to attend more scientific and research-oriented places such as Science Festivals, Planetariums, and Renewable Energy Centers. The low participation in STEM and science centers across all grade levels indicates shortcomings in promotion and content enrichment in these areas. Overall, the results suggest that as students grow older, they gravitate towards more conscious and goal-oriented activities.

The analysis results showing the distribution of places visited and activities participated in with interest by middle and high school students, according to the places where they have spent the majority of their lives, are presented in Figure 6.



Not: Science Festivals (A); Art Museum (B); History Museum (C); Botanical Garden (D); Plateau (E); Amusement Park (F); Archaeology Museum (G); Science Chat Cafes (H); Agricultural Fields and Greenhouses (I); Ancient Cities & Historical Buildings (J) ; Art Galleries & Workshops (K); Health Institutions & Organizations (L); Industrial Establishments & Factories (M); Nature Education & Nature Schools (N); Zoo & Aquarium (O); Forests, Rivers & Lakes (P); National Park (R); Sky Observation & Planetariums (S); Science Centers, STEM & Robotics Coding Workshops (T); Sports Competitions (U); Fairs or Festivals (V); Canyons, Waterfalls, Caves & Volcanoes (W); Renewable Energy Production Centers (X); Other (Y)

Figure 6. Distribution of places visited and activities participated in by middle and high school students within the scope of informal learning, by place where they have spent the majority of their lives

The analysis based on place of residence shows that students living in villages and district centers participate more frequently in nature-related activities such as highland visits, agricultural fields, and forests (see Figure 6). In contrast, students residing in cities and metropolitan areas tend to engage more in cultural activities, including museums, art galleries, and healthcare institutions. Notably, participation in STEM and energy production centers remains low across all residential areas. These results highlight that rural-urban differences are directly reflected in access to informal learning opportunities. Moreover, geographical factors significantly influence the informal learning resources available to students. Additionally, the natural or infrastructural opportunities provided by the living environment directly affect how students engage with informal learning settings.

The places visited and activities participated in by middle and high school students within the scope of informal learning were analyzed using the chi-square independence test for two categorical variables to determine whether they differed according to gender, grade level, and place of residence. According to the chi-square test results, the places visited and activities participated in by participants within the scope of informal learning differed significantly according to their gender,  $X^2=168.628$ ,  $p=.001$ , grade level,  $X^2=339.281$ ,  $p=.001$ , and place of residence,  $X^2=630.666$ ,  $p=.001$ .

## **Discussion**

This study aimed to identify the types of summer and youth camps attended by middle and high school students, as well as the places they visited and the engaging activities in which they participated within the scope of informal learning opportunities. In addition, the study examined whether these opportunities differed according to students' demographic characteristics such as gender, grade level, and place of residence.

Based on the evaluation of the collected data, the study revealed significant results regarding middle and high school students' participation in summer and youth camps, the places they visited, and the types of activities in which they engaged, and whether these differed according to gender, grade level, and place of residence. It was found that approximately five out of six students had not participated in any summer or youth camps. Among those who had attended at least one camp, participation was concentrated particularly in sports, swimming, folk dance, and equestrian camps. By contrast, more than four-fifths of the students reported visiting informal learning environments and attending engaging activities. The most frequently visited sites were "history museums" and "ancient cities and historical structures," while students also participated in activities held in informal learning environments such as

“amusement parks”, “plateaus”, “forests, rivers, and lakes”, and “agricultural areas and greenhouses”. In Turkey, the Ministry of Youth and Sports offers several types of youth camps aimed at providing young people with opportunities to spend their leisure time in ways that are both entertaining and educational. These include “Youth Camps”, “Career and Motivation Camps”, “Civilization, History, and Culture Camps”, “Ramadan Camps”, “Camp+”, and “Vision Camps” (Directorate General of Youth Services [DGYS], 2025). However, no youth camps exist in the city where this study was conducted. Although participation in youth camps is available free of charge through local youth centers affiliated with the Ministry, the result of very low participation in such camps suggests that access to these state-provided opportunities is insufficient or that students are unable to attend for various reasons. Considering the geographical, historical, economic, and cultural features of the city, it can be argued that the informal learning opportunities provided to children and youth substantially shape their participation patterns. The city is characterized by wide plateaus, forests, rivers, canyons, and also includes the region’s largest freshwater lake and second-largest lake overall. The economy is predominantly based on agriculture and livestock, with extensive farmlands, greenhouses, and pastures. The city also has a rich historical heritage, including a UNESCO World Heritage archaeological site, archaeological and ethnographic museums, history and culture museums, a historic castle, and fortifications. Thus, the informal learning environments in which students participate are consistent with the opportunities offered by the city’s natural, historical, and economic context. Nonetheless, informal learning opportunities available to individuals should not be confined to their immediate environment, as intercity tourist, historical, or cultural visits may also provide access to diverse informal learning settings. Children and young people engage in a variety of activities outside of their basic needs and school-related responsibilities, spending their leisure time in activities provided by governmental institutions, private organizations (e.g., Non-Governmental Organizations [NGOs]), schools, communities, and families. While they choose which activities to attend, their immediate environment may also influence their decisions (Eshach, 2007). What is essential is that every child should have equal access to a diverse range of leisure activities. However, this is not always possible, primarily because opportunities may not always align with children’s individual interests, preferences, and abilities.

The results indicated that boys and girls did not significantly differ in their overall levels of participation in summer and youth camps as informal learning environments. This result is consistent with studies suggesting that gender is not a primary determinant of participation in informal learning opportunities (Renninger & Hidi, 2016). However, in the context of summer and youth camps, gender-specific variations in participation in particular activities were observed. Male students were found to participate more frequently in sports and swimming camps, while female students attended folk dance camps at higher rates (Figure 1). This result aligns with studies showing that gender may be associated with the content and focus of informal activities (Tisza et al., 2019). The generally gender-independent participation in summer and youth camps may reflect the accessibility of such informal learning opportunities to all students. This interpretation is also supported by the study of Reznik et al. (2023), which emphasized equality and inclusivity in informal learning. In the city where the research was conducted, sports tournaments mostly football are organized periodically by central and local administrations, and football is an activity in which boys participate more intensively. Folk dances, especially Caucasian folk dances, are an important cultural activity in the region and are supported by both public institutions and NGOs. Although both boys and girls participate in these groups, the higher participation of girls in folk dance camps may reflect individual preference rather than availability of opportunities.

Notably, both girls and boys showed relatively high levels of participation in swimming camps, which is surprising given the city's distance from coastal areas. Students who attended such camps mostly did so through opportunities offered by youth centers. Slightly higher participation of boys may reflect parental reluctance to allow girls to travel outside the city without family accompaniment, given the stronger protective cultural attitudes toward girls in Turkish society (Erzeybek, 2015). No significant differences were found in the types of summer and youth camps attended by students across grade levels. Supporting this, Falk and Dierking (2010) highlighted that informal learning is highly contextual and influenced more by family, social resources, and personal motivation than by school grade. Although differences were not statistically significant, some grades showed relatively higher participation rates in specific activities. In particular, 7th graders reported higher participation in sports, religious, and folk-dance camps compared to other grades (Figure 2). This result is consistent with related literature (Kerai et al., 2024). The lack of significant grade-level differences may reflect the structure of the most commonly attended camp types sports and folk dance which are organized separately for different age groups, thereby ensuring equal access. Slightly higher participation among certain grades may be related to individual preferences or available opportunities. The results also demonstrated significant differences in summer and youth camp participation according to students' place of residence. This result aligns with studies indicating that urban living facilitates greater access to informal learning opportunities (Alam & Parvin, 2024; Kormos & Wisdom, 2021). Students from cities and districts were more likely to attend sports, swimming, and folk-dance camps, whereas those from villages were more likely to participate in horseback riding activities (Figure 3). The higher participation in urban areas may be linked to the greater availability of public services, including sports and cultural events, in central settlements, while rural areas tend to offer more local activities such as horseback riding.

Compared to other types of camps, participation in "Astronomy, Aviation, and Sky Observation Camps", "Mathematics and Science Camps", and "STEM, Robotics, and Science Workshops" was found to be relatively low. Supporting this result, Mupezeni and Kriek (2018) showed that differences in rural students' participation in informal learning activities are largely due to inadequate facilities and lack of support. In contrast, a limited number of studies suggest that residence may not always present a disadvantage and that students in rural and suburban areas may experience informal learning opportunities similar to those in urban settings (Grinnell et al., 2023). The results are consistent with the availability of opportunities provided by central and local governments and NGOs in the research city. For example, the city lacks observatories, science cafés, or STEM centers, and STEM-related opportunities are limited to activities at youth centers and science and arts centers. Thus, participation in such activities requires students to travel to other cities through organized camps or rely on family resources, resulting in limited participation. Supporting this interpretation, Dixon (2023) highlighted the disadvantages and barriers faced by rural students in STEM learning, while Henley and Roberts (2016) also reported a range of economic, geographic, social, and educational barriers to STEM education and career success.

The results further revealed that the places visited and activities attended by students varied significantly according to gender, grade level, and place of residence. In terms of gender, girls were more likely than boys to visit "history museums" and "ancient cities and historical structures", as well as attend activities at "amusement parks", "plateaus", "forests, rivers, and lakes", "zoos and aquariums", "national parks", and "fairs, festivals, and carnivals." By contrast, boys were more likely to visit "agricultural areas and greenhouses" and attend

“sports competitions”. Grade-level differences included higher participation by 7th and 8th graders in visits to “ancient cities and historical structures”, as well as “canyons, waterfalls, caves, and volcanoes”, “zoos and aquariums”, “amusement parks”, “sports competitions”, and “fairs, festivals, and carnivals”. Additionally, 7th graders reported higher participation in visits to “forests, rivers, and lakes,” 6th and 8th graders visited “history museums” more frequently, and 5th and 8th graders visited “art museums” at higher rates. In terms of residence, students from urban and district areas were more likely to visit “history museums”, “art museums”, “archaeology museums”, “ancient cities and historical structures”, “zoos and aquariums”, “national parks”, and “canyons, waterfalls, caves, and volcanoes”, as well as attend “sports competitions” and visit “amusement parks”. Conversely, students from villages were more likely to visit “agricultural areas and greenhouses” and “plateaus”.

Overall, it was found that students had low participation rates in visits to informal learning environments such as “botanical gardens”, “art galleries and studios”, “industrial institutions and factories”, “planetariums and observatories”, and “renewable energy production centers”. Similarly, participation in activities organized in informal learning environments such as “nature education programs and forest schools”, “science cafés”, “science centers”, and “STEM and robotics workshops” was also low. This reflects the limited informal learning opportunities available in the research city, which lacks facilities such as science cafés, observatories, forest schools, botanical gardens, art galleries, and STEM centers. The low visitation rates to these types of institutions may therefore be explained by their absence in the city. Although the city does host some renewable energy plants and industrial institutions such as cement, sugar, dairy, and agricultural machinery factories students’ low visitation rates to these facilities may be attributed to individual preferences and opportunities.

## **Conclusion**

The results of this study revealed that middle and high school students’ participation in summer and youth camps was low. It was concluded that students’ participation in such camps was independent of their gender and grade levels. However, participation was found to vary according to place of residence. The results indicated that children living in villages were disadvantaged in terms of attending summer and youth camps. Another variable examined in the study concerned the types of places visited and interesting activities attended by middle school students. With regard to this variable, the overall level of participation was found to be high. Nevertheless, the results showed that visits to certain informal learning environments and participation in some types of interesting activities were reported at higher rates. Furthermore, the results revealed that the types of places visited and activities attended varied by gender, grade level, and place of residence. In terms of informal learning environments, both the youth camps attended and the places visited or activities participated in by students were found to be significantly influenced by the geographical, historical, economic, and cultural characteristics of the city in which the research was conducted. However, participation in visits to certain informal learning environments, such as factories, industrial facilities, and renewable energy production plants located in the vicinity, was relatively low. In addition, it was concluded that students did not fully benefit or were unable to benefit from informal learning environments provided on a national scale by public or private institutions, as exemplified by the Ministry of Youth and Sports’ youth camps.

## **Limitations**

This study was limited to a single province in eastern Türkiye. Therefore, the results cannot be generalized to the whole country. The results may be applicable to students in other

cities offering similar opportunities; however, differences in culture, socioeconomic conditions, local resources, and educational structures may lead to variation in outcomes across regions. Since the study covers data from a specific time period, the results may also vary over time. Furthermore, students were asked to report whether or not they had participated in activities within listed informal learning environments. Their responses were used to evaluate the opportunities they had access to. However, the reasons behind students' participation or non-participation in summer and youth camps, as well as in visits to various places and activities, could not be investigated. The self-reported nature of the data may also have been influenced by factors such as social desirability bias, memory errors, or response motivation.

## **Recommendations**

Based on results, it is recommended to enhance the visibility of summer and youth camps with content beyond sports, swimming, and folk-dance camps typically offered locally. In particular, “astronomy, aviation, and sky observation camps”, “mathematics and science camps”, and “STEM, robotics, and science workshops” should be promoted, and access should be supported through free or low-cost options, especially in rural or disadvantaged regions. The study also found that student participation in visits to informal learning environments such as “botanical gardens”, “art galleries and studios”, “planetariums and sky observation centers”, and “renewable energy facilities” was relatively low. Investments and initiatives should therefore be made to increase students' visits to and engagement in activities offered by informal learning settings such as “nature education programs and forest schools”, “science cafés”, “science centers”, and “STEM and robotics workshops”. Moreover, measures should be taken to ensure equitable access across gender, grade levels, and place of residence so that all groups of children and youth can benefit equally from opportunities provided by informal learning environments. Special attention should be given to children living in villages, with efforts directed at increasing their participation in visits to and activities within informal learning environments both within their province and in other parts of the country. For future studies, it is recommended to conduct mixed-method research combining descriptive and qualitative approaches to investigate not only the extent of children's and young people's participation in informal learning environments but also the underlying reasons for their participation or non-participation.

## Declarations

**Funding Information:** This study was supported by Kafkas University Scientific Research Projects Coordination Office with the code 2022-SB-59

**Ethics Statemen:** Ethical permissions were obtained from the decision of Kafkas University Social and Human Sciences Ethics Committee dated 10/12/2021 and numbered 25 and the decision of Kars Provincial Directorate of National Education dated 20.09.2022 and numbered E.58291949.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

**Data availability:** Our data can always be shared if requested.

## References

- Adams, J. D. (2020). Designing frameworks for authentic equity in science teaching and learning: Informal learning environments and teacher education for STEM. *Asia-Pacific Science Education*, 6(2), 456-479. <https://doi.org/10.1163/23641177-bja10016>
- Akram, S. (2024). Bridging the gap: Understanding out-of-school children in Pakistan. *Vulnerable Children and Youth Studies*, 19(3), 454-469. <https://doi.org/10.1080/17450128.2024.2352623>
- Alam, G. M., & Parvin, M. (2024). Has secondary science program become an elite urban education product in the former colonized nation? *Education and Urban Society*, 56(8), 1002-1024. <https://doi.org/10.1177/00131245241238360>
- Balçın, M. D., & Topaloğlu, M. Y. (2019). Investigation of primary school students' perceptions towards engineers and scientists at out-of-school learning environments. *Ordu University Journal of Social Science Research*, 9(1), 157-170.
- Ballane, G. P. (2019). *Understanding of self-confidence in high school students*. (Unpublished doctoral thesis). Walden University.
- Bonnette, R. N., Crowley, K., & Schunn, C. D. (2019). Falling in love and staying in love with science: Ongoing informal science experiences support fascination for all children. *International Journal of Science Education*, 41(12), 1626-1643. <https://doi.org/10.1080/09500693.2019.1623431>
- Bourke, R., O'Neill, J., & Loveridge, J. (2024). Conceptions and dimensions of children's informal learning. In R. Bourke., J. O'Neill & J. Loveridge (Eds.), *Understanding children's informal learning: Appreciating everyday learners* (pp. 53-74). Emerald Publishing Limited.
- Buck, G. A., Chinn, P. W., & Upadhyay, B. (2023). Science education in urban and rural contexts: Expanding on conceptual tools for urban-centric research. In *Handbook of research on science education* (pp. 359-388). Routledge.
- Chuang, S. (2021). The applications of constructivist learning theory and social learning theory on adult continuous development. *Performance Improvement*, 60(3), 6-14. <https://doi.org/10.1002/pfi.21963>
- DeWitt, J., & Archer, L. (2017). Participation in informal science learning experiences: The rich get richer?. *International Journal of Science Education*, 7(4), 356-373. <https://doi.org/10.1080/21548455.2017.1360531>
- Djonko-Moore, C. M., Leonard, J., Holifield, Q., Bailey, E. B., & Almughyirah, S. M. (2018). Using culturally relevant experiential education to enhance urban children's knowledge and engagement in science. *Journal of Experiential Education*, 41(2), 137-153. <https://doi.org/10.1177/10538259177421>
- Directorate General of Youth Services [DGYS]. (2025). Youth camps. <https://genclikhizmetleri.gov.tr/hizmetlerimiz/genclik-kamplari-8/>.

- Dixon, C. S. (2023). Barriers and solutions for STEM students from rural areas. In *Handbook of research on race, culture, and student achievement* (pp. 136-154). IGI Global.
- Dou, R., Hazari, Z., Dabney, K., Sonnert, G., & Sadler, P. (2019). Early informal STEM experiences and STEM identity: The importance of talking science. *Science Education, 103*(3), 623-637. <https://doi.org/10.1002/sce.21499>
- Erzeybek, B. (2015). *Determining the gender role of parents during rising up their children* (Master's thesis, Ankara University).
- Eshach, H. (2007). Bridging in-school and out-of-school learning: Formal, non-formal, and informal education. *Journal of Science Education and Technology, 16* (2), 171-190. <https://doi.org/10.1007/s10956-006-9027-1>
- Falk, J. H., & Dierking, L. D. (2010). *The 95 percent solution: School is not where most learning takes place. American Scientist, 98*(6), 486-493. <https://doi.org/10.1511/2010.87.486>
- Gerber, B. L., Marek, E. A., & Cavallo, A. M. (2001). Development of an informal learning opportunities assay. *International Journal of Science Education, 23*(6), 569-583. <https://doi.org/10.1080/09500690116959>
- Ghadiri Khanaposhtani, M., Liu, C. J., Gottesman, B. L., Shepardson, D., & Pijanowski, B. (2018). Evidence that an informal environmental summer camp can contribute to the construction of the conceptual understanding and situational interest of STEM in middle-school youth. *International Journal of Science Education, 8*(3), 227-249. <https://doi.org/10.1080/21548455.2018.1451665>
- Grinnell, F., Dalley, S., & Reisch, J. (2023). High school science fair: School location trends in student participation and experience. *PloS One, 18*(9), e0291049.
- Habig, B., Gupta, P., Levine, B., & Adams, J. (2020). An informal science education program's impact on STEM major and STEM career outcomes. *Research in Science Education, 50*(3), 1051-1074. <https://doi.org/10.1007/s11165-018-9722-y>
- Henley, L., & Roberts, P. (2016). Perceived barriers to higher education in STEM among disadvantaged rural students: A case study. *Inquiry, 20*(1), 19-38.
- Houston, A. (2023). *A space of our own: Informal social spaces in middle schools*. (Unpublished master thesis). The Florida State University.
- Jeong, S., Han, S. J., Lee, J., Sunalai, S., & Yoon, S. W. (2018). Integrative literature review on informal learning: Antecedents, conceptualizations, and future directions. *Human Resource Development Review, 17*(2), 128-152. <https://doi.org/10.1177/1534484318772242>
- Johnson, M., & Majewska, D. (2022). *Formal, non-formal, and informal learning: What are they, and how can we research them? Research report*. Cambridge University Press & Assessment.
- Jones, N. N., Wilson, A. D., Gaskin, L. M. N., Rayford, D., & Owusu, K. A. (2025). Using quantitative ethnography to explore the cultural nuances of identity of secondary students in Ghana, Kenya and the United States of America in an informal learning program. *Journal of International Cooperation in Education, 27*(2), 104-120. <https://doi.org/10.1108/JICE-04-2024-0016>
- Kerai, S., Ibrahim, M., Molyneux, T. M., Hussain, U., Gadermann, A., Kassam, R., ... & Oberle, E. (2024). Out-of-school time use in Pakistan: A qualitative study featuring youth's voices. *Journal of Research on Adolescence, 34*(2), 296-312. <https://doi.org/10.1111/jora.12916>
- Kollmayer, M., Schober, B., & Spiel, C. (2018). Gender stereotypes in education: Development, consequences, and interventions. *European Journal of Developmental Psychology, 15*(4), 361-377. <https://doi.org/10.1080/17405629.2016.1193483>

- Kormos, E., & Wisdom, K. (2021). Rural schools and the digital divide: Technology in the learning experience. *Theory & Practice in Rural Education*, 11(1), 25-39. <https://doi.org/10.3776/tpre.2021.v11n1p25-39>
- Kumari, M., Kumar Sharma, A., Basu, N., Rastogi, P., & Mishra, S. (2024). Significance of informal education in shaping academic success during middle school years. *International Journal of Social Sciences Arts and Humanities*, 11(2), 55-66.
- Lenard, M. A., & Silliman, M. (2025). Informal social interactions, academic achievement and behavior: Evidence from peers on the school bus. *The Economic Journal*, 135 (October), 2359–2373. <https://doi.org/10.1093/ej/ueaf013>
- Lewin, C., & Charania, A. (2018). Bridging formal and informal learning through technology in the twenty-first century: issues and challenges. In: Voogt, J., Knezek, G., Christensen, R., Lai, KW. (Eds.), *Second handbook of information technology in primary and secondary education* (pp.1-17). Springer.
- Low, A. M., & Kalender, Z. Y. (2024). Predictors and socio-demographic disparities in stem degree outcomes: A UK longitudinal study using hierarchical logistic regression. arXiv preprint arXiv:2408.05853. <https://doi.org/10.48550/arXiv.2408.05853>
- Maiorca, C., Roberts, T., Jackson, C., Bush, S., Delaney, A., Mohr-Schroeder, M. J., & Soledad, S. Y. (2021). Informal learning environments and impact on interest in STEM careers. *International Journal of Science and Mathematics Education*, 19(1), 45-64. <https://doi.org/10.1007/s10763-019-10038-9>
- Miles, S., Pohl, A., Stauber, B., Walther, A., Banha, R. M. B., & do Carmo Gomes, M. (2018). *Communities of youth: Cultural practice and informal learning*. Routledge.
- Moreland, R. (2019). Towards a learning society: The role of formal, non-formal and informal learning. In P. Oliver (Ed.), *Lifelong and continuing education* (pp. 159-179). Routledge.
- Mupezeni, S., & Kriek, J. (2018). Out-of-school activity: A comparison of the experiences of rural and urban participants in science fairs in the Limpopo province, South Africa. *EURASIA Journal of Mathematics, Science and Technology Education*, 14(8), em1577. <https://doi.org/10.29333/ejmste/92041>
- Nygren, H., Nissinen, K., Hämäläinen, R., & De Wever, B. (2019). Lifelong learning: Formal, non-formal and informal learning in the context of the use of problem-solving skills in technology-rich environments. *British Journal of Educational Technology*, 50(4), 1759-1770. <https://doi.org/10.1111/bjet.12807>
- Pallant, J. (2010). *SPSS survival manual: A step by step guide to data analysis using SPSS* (4th ed). Allen & Unwin.
- Perets, S., Davidovich, N., & Lewin, E. (2023). Perceptions of leadership, self-confidence and leadership programs among teenage girls in Israel. *Cogent Education*, 10(1), 2195742. <https://doi.org/10.1080/2331186X.2023.2195742>
- Pesch, A., Fletcher, K. K., Golinkoff, R. M., & Hirsh-Pasek, K. (2025). Evidence-based meets community-centred: A new approach to creating informal learning opportunities for children. *British Journal of Developmental Psychology*, 43(1), 5-11. <https://doi.org/10.1111/bjdp.12511>
- Renninger, K. A., & Hidi, S. E. (2016). *The power of interest for motivation and engagement*. Routledge.
- Reznik, G., Massarani, L., & Calabrese Barton, A. (2023). Informal science learning experiences for gender equity, inclusion and belonging in STEM through a feminist intersectional lens. *Cultural Studies of Science Education*, 18(3), 959-984. <https://doi.org/10.1007/s11422-023-10149-4>

- Riedinger, K. (2015). Identity development of youth during participation at an informal science education camp. *International Journal of Environmental and Science Education*, 10(3), 453-475. <https://doi.org/10.12973/ijese.2015.254a>
- Roberts, T., Jackson, C., Mohr-Schroeder, M. J., Bush, S. B., Maiorca, C., Cavalcanti, M., ... & Cremeans, C. (2018). Students' perceptions of STEM learning after participating in a summer informal learning experience. *International Journal of STEM Education*, 5(1), 35. <https://doi.org/10.1186/s40594-018-0133-4>
- Rogoff, B., Callanan, M., Gutiérrez, K. D., & Erickson, F. (2016). The organization of informal learning. *Review of Research in Education*, 40(1), 356-401. <https://doi.org/10.3102/0091732X16680994>
- Sahin, A., Gulacar, O., & Stuessy, C. (2015). High school students' perceptions of the effects of international science olympiad on their STEM career aspirations and twenty-first century skill development. *Research in Science Education*, 45(6), 785-805. <https://doi.org/10.1007/s11165-014-9439-5>
- Salleh, N. Z. M., Shaari, R., Yaacob, T. Z., Abdullah, M., & Selamat, R. (2021, November). *Using informal learning to increase body confidence awareness among schoolchildren*. In R. Omar (Chair), Embracing New Norms. International Symposium on Teaching & Learning Innovation. Johor Bahru, Malaysia
- Sapulette, A. A., & Ritiau, B. (2025). Reformulation of the education system: Negotiating the gap in access to education through strengthening social capital capacity. *Journal of Social Science and Business Studies*, 3(2), 412-419. <https://doi.org/10.61487/jssbs.v3i2.142>
- Shah, I., Ijaz, Z., Ali, S., & Alrweili, H. (2025). Modeling the determinants of out-of-school children in Pakistan. *Measurement: Interdisciplinary Research and Perspectives*, 1-14. <https://doi.org/10.1080/15366367.2025.2449630>
- Simbo, C. (2025). Exploring the purpose and evolution of education: from informal learning to formal schooling, challenges, international legal frameworks and recommendations for the future. *International Journal of Research in Business & Social Science*, 14(2), 309-315. <https://doi.org/10.20525/ijrbs.v14i2.3920>
- Starr-Glass, D. (2015). Making sense of surrounding difference: Informal learning in national culture adaptation. In O. Mejiuni, P. Cranton, & O. Táiwò (Eds.), *Measuring and analyzing informal learning in the digital age* (pp. 198–214). IGI Global. <https://doi.org/10.4018/978-1-4666-8265-8.ch014>
- Stevens, S., Andrade, R., & Page, M. (2016). Motivating young Native American students to pursue STEM learning through a culturally relevant science program. *Journal of Science Education and Technology*, 25(6), 947-960. <https://doi.org/10.1007/s10956-016-9629-1>
- Tisza, G., Papavlasopoulou, S., Christidou, D., Voulgari, I., Iivari, N., Giannakos, M. N., ... & Markopoulos, P. (2019, May). The role of age and gender on implementing informal and non-formal science learning activities for children. In *Proceedings of the Fablearn Europe 2019 Conference* (pp. 1-9). New York, NY, USA: Association for Computing Machinery, <http://dx.doi.org/10.1145/3335055>. 3335065.
- Todd, B. L., & Zvoch, K. (2019). The effect of an informal science intervention on middle school girls' science affinities. *International Journal of Science Education*, 41(1), 102-122. <https://doi.org/10.1080/09500693.2018.1534022>
- URL 1: <https://lotusfinans.com/2025-illere-gore-tahmini-hanehalki-gelirleri/>
- Wang, M.-T., & Hofkens, T. L. (2020). Beyond classroom academics: a school-wide and multi-contextual perspective on student engagement in school. *Adolescent Research Review*, 5(4), 419–433. <https://doi.org/10.1007/s40894-019-00115-z>

Ye, W. (2018). Socioeconomic status and out-of-school citizenship education in China's Shanghai. *Education and Urban Society*, 50(7), 641-669. <https://doi.org/10.1177/0013124517713609>

## Appendix

### *Informal Learning Opportunities Test (ILOT)*

#### Demographic Variables and 10. and 17. Items Section

---

##### Part I: Personal Information

1. Gender: Female Male

2. Grade level: 5th 6th 7th 8th 9th 10th

3. Where have you spent the majority of your life? (Please select only one option.)

Big city  City center  District  Village  Other (Please specify the name of the place)

---

10. Have you ever participated in summer camps or youth camps?

Yes  No

\* If your answer to this question is Yes, please put an X in the box below the camp activities you participated in.

Horse riding

Trekking

Archery

Religious education camps

Sports camps

Folk dances

Swimming

Math and science camps

Astronomy, aviation and sky observation camps

STEM, robotic coding and workshops

Mind games camp

Art and literature camps

\* If you have participated in any camp activity not listed above, please write its name in the blank:

---

17. Please put an X in the box at the beginning of all the places you have visited so far or all the interesting activities you have participated in.

Science festivals

Agricultural areas and greenhouses

National parks (protected natural and touristic areas)

Art museum

Ancient cities and historical buildings

Sky observation and planetariums (planet houses)

History museum

Art galleries and workshops

Science centers, STEM and robotic coding workshops

Botanical garden

Health institutions and organizations

Sports competitions (except school team matches)

Plateaus

Industrial organizations and factories

Fairs, festivals or festivals organized in the province or district

Amusement park

Nature education and nature schools

Canyons, waterfalls, caves and volcanoes

Archaeology museum

Zoo and aquarium

Renewable energy production centers (Hydroelectric, thermal, geothermal, wind, solar, nuclear power plants)

Science chat cafes

Forests, rivers and lakes

\* Write the names of places you have visited or interesting events you have participated in that are not on the list above in the spaces below.

---