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# Public Opinion about European Researchers' Night on Climate Change and Polar Science in Türkiye

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**Abstract**

The European Researchers' Night is an annual event held across Europe on the last Friday of September, with the primary goal of promoting public recognition of scientists, disseminating information about the real-world impact of their research, inspiring young people to pursue careers in science, and raising awareness about research and innovation activities. In 2022, European Researcher's Night focused on climate change and polar science in Istanbul and Gaziantep provinces. The central aim was to enhance public awareness of polar regions and global climate change, as well as to facilitate the acknowledgment of researchers and their work by the general public. This study examined the opinions of participants who attended these events, including 221 primary school students, 687 secondary school students, 525 high school students, and 319 adults. Utilizing a mixed-method approach, participant opinions were collected through both questionnaires and interviews conducted concurrently during the events. The results indicated that the events were highly effective in increasing participants' understanding of climate change and polar science. Many attendees reported a heightened interest in scientific topics and a greater appreciation for the work of researchers. In conclusion, these events serve as effective channels for communicating scientific research with the public and underscore the importance of research extending beyond the confines of research communities.

**Keywords**: European researchers' night, polar science, climate change, science festival, public opinion.

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## Introduction

The European Researchers' Night, held annually across Europe on the last Friday of September, is an event designed to bring research closer to the public, increase the visibility of researchers, and inspire young people toward scientific careers (Roche et al., 2017; Jensen et al., 2021; CORDIS, 2022). This initiative, funded by the European Union since 2005, promotes public engagement with science through interactive activities like demonstrations, workshops, and exhibitions, especially targeting youth and families with limited exposure to STEAM (Science, Technology, Engineering, Arts, and Mathematics) fields. By fostering connections between researchers and communities, it advances scientific literacy and inquiry in accessible and engaging ways.

This study aims to investigate the impacts of the European Researchers' Night events in Türkiye, specifically focusing on public engagement and awareness, particularly regarding climate change. By examining public feedback on events held under the EDUCATE project, this research explores how these activities influence participants' perceptions, behaviors, and awareness of critical scientific topics. Through this analysis, we aim to contribute to the understanding of science festivals' influence on society in Türkiye.

### Literature Review

Science festivals, which vary in duration from a single day to a month within the same area, are important in encouraging a positive attitude toward science among diverse groups, including students, families, educators, and academics (Enserink, 2004; Bencze & Bowen, 2009). Studies indicate that such events effectively foster scientific curiosity and promote research careers among participants (Gülgün et al., 2019). For instance, Martini et al. (2022) found that similar events in over 20 Italian cities successfully engaged young audiences by creating positive, impactful experiences with science. Likewise, Arnoe et al. (2016) emphasize that these events promote direct communication between researchers and the public, helping to demystify scientific careers and inspiring youth to consider science as a viable path. Mazitelli et al. (2018) also observed that while not all participants aspired to be scientists, many expressed enthusiasm for science, emphasizing the role of these events in making science accessible and appealing (Jensen & Buckley, 2012; Roche et al., 2018).

While there is limited literature specifically on the impacts of European Researchers' Night in Türkiye, international studies have shown significant positive outcomes from similar public engagement events. Such events increase public understanding of science, foster positive attitudes towards scientific research, and encourage young people to pursue careers in science (Brossard & Lewenstein, 2010; Roche et al., 2018). The European Commission's Horizon 2020 Work Programme highlights the importance of these events in promoting public recognition of researchers and their contributions to society. Further research and detailed reporting on the outcomes of European Researchers' Night in Türkiye will contribute to the broader understanding of the impact of public engagement in science.

In Türkiye, the European Researchers' Night has taken place at various times, including in 2014, 2016, and 2018 (TÜBİTAK,2021). Events like "Life is Science, Science is Life: LET'S DO THE SCIENCE!" and "SCI-ALL (Science Unites ALL)" combined fun and educational activities, positively shaping participants' perceptions of science and researchers (CORDIS, 2024a, 2024b). These events received high satisfaction ratings, highlighting the positive impact of public engagement initiatives and their potential to promote scientific interest among young people and the broader community in Türkiye. International and national evidence suggests that these events empower participants by fostering positive attitudes towards science and supporting a scientifically informed society (Altay & Lakhlifi, 2020).

### Importance of the Study

In this study, we aim to understand the broader impacts of the European Researchers' Night events on the Turkish public, particularly by examining how these activities influence participants' views. Gathering public opinions on such events is essential, as it provides insights into the effectiveness of science engagement initiatives and highlights areas for improvement. Public feedback allows organizers to design future events that align more closely with audience expectations and interests, ensuring that the events remain relevant and engaging while effectively promoting scientific awareness (Bunderson, 1996).

As part of the EDUCATE project, the European Researchers' Night events in 2022 provide a unique context to explore these dynamics. Held in Istanbul and Gaziantep, these events focused on climate change and polar research themes, targeting an audience that included families, students, and young people with limited prior exposure to scientific research. These events aimed to increase awareness and foster a sense of responsibility toward global issues by directly engaging participants with critical topics like environmental conservation. Understanding the effects of these targeted activities, particularly on younger audiences, can offer valuable insights for enhancing future European Researchers' Night events.

Including climate change activities is crucial, given the pressing nature of global environmental challenges. Events emphasising climate literacy are particularly valuable as they inform and empower the public to take a proactive approach to environmental issues (Miller & Edwards, 2017). Türkiye's recent initiatives in polar research, including the establishment of the Polar Research Center at Istanbul Technical University and the Polar Research Institute under TÜBİTAK MAM, highlight the country's commitment to this cause. Through the EDUCATE project, researchers from Türkiye aim to increase public awareness about climate change by featuring climate-themed activities in the European Researchers' Night. By analyzing participant feedback, this study will assess the effectiveness of these efforts and contribute to the broader understanding of the role of public engagement in fostering environmental responsibility.

This research addresses the following questions:

1. What are the most significant reasons for the participants attending the EDUCATE events?
2. To what extent do participants believe that the EDUCATE events have influenced their daily behaviors and increased their awareness and understanding of the poles and climate change?
3. How do participants evaluate the success of the events?
4. What are the participants' overall views of the EDUCATE events, including the content, organization, and relevance of the activities presented?
5. What are the participants' views on how EDUCATE events affect their interest in scientific topics and their understanding of the work of researchers?
6. What suggestions do participants have for improving the EDUCATE activities based on their experiences?

## Materials and Method

### Research design

This research adopted a mixed-methods approach, a comprehensive methodology involving collecting both qualitative and quantitative data to address the research inquiries. This approach leverages the advantages inherent in integrating these distinct types of data, thereby maximizing the benefits derived from such integration (Creswell, 2017). Within the framework of this study, a convergent parallel design was employed, facilitating the simultaneous collection of quantitative and qualitative data during the activities. According to Creswell and Plano Clark (2018), this design is characterized by the concurrent collection and analysis of both data types, followed by integrating the results into a comprehensive interpretation. The EDUCATE Night events, held over two days in Istanbul and Gaziantep, provided the setting for this data collection, where diverse groups of students and adult guests engaged with various activity stands. Obtaining participant feedback immediately before their departure from the event areas required the concurrent collection of quantitative and qualitative data. Creswell and Plano Clark (2018) further elucidate that the convergent parallel design is particularly advantageous in scenarios where the researcher is constrained by time and must collect both data types in a single field visit and where a thorough understanding of the research problem mandates the integration of both quantitative and qualitative insights.

### Study setting

The EDUCATE project, conducted as part of the "European Researchers' Night" under the Marie Skłodowska-Curie Actions of the European Commission, featured a series of events focused on global climate change. These events were designed to present research findings in a manner accessible to the general public, to enhance societal awareness of polar regions and global climate change. By illustrating the impact and benefits of this research on everyday life, the project sought to engage the public and

introduce them to the relevant scientific studies and the researchers behind them. A key objective of the project was to inspire the younger generation by providing enjoyable and informative experiences that highlighted the roles of researchers, thereby fostering potential role models. To achieve these aims, various activities-including science workshops, booth events, exhibitions, seminars, and concerts-were organized in Istanbul and Gaziantep from September 30 to October 1, 2022. In addition to these events, awareness-raising campaigns were conducted before and after the event, utilizing digital platforms as well as social and visual media to spark curiosity about polar regions, global climate change, and related scientific research. The events featured a range of interactive and educational activities, such as hands-on experiments, science shows, demonstrations, guided tours, competitions, quizzes, games, lectures, special school programs, and concerts. Approximately 150 staff members were involved in the organization and execution of these diverse EDUCATE events.

**Study group**

Quantitative and qualitative data were systematically collected from event participants to evaluate the activities' effectiveness. For the quantitative phase of the research, a purposive sampling method was employed, with the maximum variation sampling technique specifically chosen to ensure a diverse representation of perspectives among stakeholders who experienced the event (Büyüköztürk et al., 2014). The rationale for choosing the maximum variation sampling method was to capture a wide range of perspectives from different stakeholders who experienced the event. The demographic characteristics of the participants in the quantitative phase are detailed in Table 1.

Table 1.
Demographic Information about the Participants in the Quantitative Research

| Level | Variable | | n | % |
|---|---|---|---|---|
| Primary | Gender | Female | 101 | 45.7 |
| | | Male | 117 | 52.9 |
| | | Missing | 3 | 1.4 |
| | Grade | 1st Grade | 49 | 22.2 |
| | | 2nd Grade | 40 | 18.3 |
| | | 3rd Grade | 37 | 17 |
| | | 4th Grade | 92 | 42.2 |
| | | Missing | 3 | 1.4 |
| | Province | İstanbul | 141 | 63.8 |
| | | Gaziantep | 80 | 36.2 |
| Secondary | Gender | Female | 369 | 53.7 |
| | | Male | 302 | 44 |
| | | Missing | 16 | 2.3 |
| | Grade | 5th Grade | 87 | 12.7 |
| | | 6th Grade | 160 | 23.3 |
| | | 7th Grade | 290 | 42.2 |
| | | 8th Grade | 128 | 18.6 |
| | | Missing | 22 | 3.2 |
| | Province | İstanbul | 399 | 58.1 |
| | | Gaziantep | 288 | 41.9 |
| High School | Gender | Female | 342 | 65 |
| | | Male | 183 | 34.8 |
| | Grade | 9th Grade | 217 | 41.3 |
| | | 10th Grade | 112 | 21.3 |
| | | 11th Grade | 133 | 25.3 |
| | | 12th Grade | 43 | 8.2 |
| | | Missing | 21 | 4 |
| | Province | İstanbul | 322 | 61.2 |
| | | Gaziantep | 203 | 38.6 |

Table 1 continuing

| | | | | |
|---|---|---|---|---|
| Adult | Gender | Female | 185 | 58 |
| | | Male | 134 | 42 |
| | Age | 30 and younger | 116 | 36.4 |
| | | 31-40 | 124 | 38.9 |
| | | 41-50 | 58 | 18.2 |
| | | 50 and older | 21 | 6.6 |
| | Province | İstanbul | 228 | 71.5 |
| | | Gaziantep | 91 | 28.5 |

As seen in Table 1, the quantitative phase of the study involved a participant pool comprising 221 primary school students, 687 secondary school students, 525 high school students, and 319 adults. The primary school students, ranging from grades 1 to 4, were aged between 6 and 11 years, whereas secondary school students, encompassing grades 5 to 8, fell within the age bracket of 11 to 15. High school students, spanning grades 9 to 12, were situated in the age range of 15 to 18 years.

Conversely, the qualitative phase of the research involved conducting face-to-face interviews with 60 participants. The study group was determined using the maximum variation sampling technique, a purposive sampling method, to ensure a broad range of perspectives from stakeholders who experienced the event (Creswell, 2017). The rationale behind this selection was to capture the diversity of views among participants, thereby enriching the qualitative analysis. Detailed information about the participants involved in the qualitative phase is presented in Table 2.

Table 2.
Demographic Information about the Participants in the Qualitative Research

| **Participant Code** | **Gender** | **Province** | **Age** | **Grade/Education** | **Occupation** |
|---|---|---|---|---|---|
| P1 | Female | Gaziantep | 11 | Secondary 6th Grade | Student |
| P2 | Male | Gaziantep | 8 | Primary 3rd Grade | Student |
| P3 | Male | Gaziantep | 10 | Primary 4th Grade | Student |
| P4 | Male | Gaziantep | 14 | High School 9th Grade | Student |
| P5 | Female | Gaziantep | 10 | Secondary 5th Grade | Student |
| P6 | Female | Gaziantep | 12 | Secondary 5th Grade | Student |
| P7 | Female | Gaziantep | 13 | Secondary 6th Grade | Student |
| P8 | Female | Gaziantep | 14 | Secondary 7th Grade | Student |
| P9 | Female | Gaziantep | 13 | Secondary 6th Grade | Student |
| P10 | Female | Gaziantep | 13 | Secondary 6th Grade | Student |
| P11 | Female | Gaziantep | 14 | Secondary 7th Grade | Student |
| P12 | Female | Gaziantep | 12 | Secondary 6th Grade | Student |
| P13 | Female | Gaziantep | 13 | Secondary 7th Grade | Student |
| P14 | Female | Gaziantep | 13 | Secondary 7th Grade | Student |
| P15 | Female | Gaziantep | 12 | Secondary 7th Grade | Student |
| P16 | Male | Gaziantep | 14 | Secondary 8th Grade | Student |
| P17 | Male | Gaziantep | 13 | Secondary 7th Grade | Student |
| P18 | Male | Gaziantep | 14 | Secondary 8th Grade | Student |
| P19 | Male | Gaziantep | 11 | Secondary 5th Grade | Student |
| P20 | Male | Gaziantep | 7 | Primary 1st Grade | Student |
| P21 | Male | Gaziantep | 12 | Secondary 6th Grade | Student |
| P22 | Male | Gaziantep | 7 | Primary 1st Grade | Student |
| P23 | Male | Gaziantep | 11 | Secondary 5th Grade | Student |
| P24 | Female | Gaziantep | 45 | Graduate Degree | Biologist |
| P25 | Female | Gaziantep | 40 | Graduate Degree | Environmental engineer |
| P26 | Male | Gaziantep | 39 | High School | Technician |
| P27 | Male | Gaziantep | 44 | Undergraduate Degree | Medical Personel |

Table 2 continuing

| | | | | | |
|---|---|---|---|---|---|
| P28 | Female | Gaziantep | 38 | Primary | Housewife |
| P29 | Male | Gaziantep | 43 | High School | Technician |
| P30 | Female | Gaziantep | 10 | Secondary 5th Grade | Student |
| P31 | Male | Gaziantep | 11 | Secondary 6th Grade | Student |
| P32 | Male | Gaziantep | 12 | Secondary 7th Grade | Student |
| P33 | Male | Gaziantep | 11 | Secondary 6th Grade | Student |
| P34 | Male | Gaziantep | 10 | Secondary 5th Grade | Student |
| P35 | Female | İstanbul | 16 | High School 11th Grade | Student |
| P36 | Male | İstanbul | 29 | Undergraduate Degree | Researcher |
| P37 | Female | İstanbul | 15 | High School 10th Grade | Student |
| P38 | Female | İstanbul | 14 | High School 9th Grade | Student |
| P39 | Female | İstanbul | 16 | High School 11th Grade | Student |
| P40 | Male | İstanbul | 17 | High School 11th Grade | Student |
| P41 | Male | İstanbul | 16 | High School 11th Grade | Student |
| P42 | Female | İstanbul | 17 | High School 11th Grade | Student |
| P43 | Female | İstanbul | 16 | High School 11th Grade | Student |
| P44 | Male | İstanbul | 16 | High School 11th Grade | Student |
| P45 | Male | İstanbul | 21 | Undergraduate Degree | University Student |
| P46 | Female | İstanbul | 17 | High School 12th Grade | Student |
| P47 | Male | Gaziantep | 8 | Primary 2nd Grade | Student |
| P48 | Male | Gaziantep | 8 | Primary 2nd Grade | Student |
| P49 | Female | Gaziantep | 16 | High School 11th Grade | Student |
| P50 | Female | Gaziantep | 16 | High School 11th Grade | Student |
| P51 | Female | Gaziantep | 16 | High School 11th Grade | Student |
| P52 | Female | Gaziantep | 51 | - | Housewife |
| P53 | Male | Gaziantep | 43 | Undergraduate Degree | Teacher |
| P54 | Female | Gaziantep | 32 | - | Housewife |
| P55 | Female | Gaziantep | 32 | - | Housewife |
| P56 | Female | Gaziantep | 40 | Undergraduate Degree | Paramedic |
| P57 | Female | Gaziantep | 43 | Undergraduate Degree | Teacher |
| P58 | Male | Gaziantep | 14 | High School 9th Grade | Student |
| P59 | Male | Gaziantep | 14 | High School 9th Grade | Student |
| P60 | Female | Gaziantep | 14 | High School 9th Grade | Student |

As can be seen in Table 2, 25 of the participants were male and 35 were female. Twelve of them participated in the events in Istanbul and 48 in Gaziantep. Their ages exhibited a broad spectrum, spanning from 7 to 51 years. Among the qualitative participants, six were classified as primary school students, 23 as secondary school students, and 17 as high school students. Additionally, 14 participants were classified as adults, each representing various occupations such as student, housewife, researcher, teacher, paramedic, environmental engineer, and technician.

**Data collection**

Both qualitative and quantitative data were procured through a collaborative effort involving volunteer assistants and researchers. Quantitative data were obtained via in-person and online methods, with the researcher and volunteer assistants facilitating data collection during the event. In the in-person approach, participants filled out printed surveys during their on-site engagement.

Concurrently, an online data collection procedure was implemented, with participant information and survey items being transitioned to a digital platform using Google Forms, thereby establishing an online form. QR codes were disseminated in various locations within the event venue to encourage participation. These QR codes provided access to surveys created through Google Forms, permitting participants to complete them using their mobile devices or tablets, with assistance from volunteer assistants as required.

Qualitative data were gathered via face-to-face interviews utilizing semi-structured interview forms. The interviews aimed to gain a deeper insight into participants' perspectives regarding EDUCATE events, the realm of science, and researchers in general. Given the significant number of student participants within the event setting, several interviews were conducted in the format of focus group discussions. A total of 37 interviews took place, spanning both Istanbul and Gaziantep. Nine of the interviews conducted in the research were focus group interviews and 28 of them were individual interviews.
In reporting these interviews, participant details, such as gender (denoted as F for female and M for male), attendance location (IST for Istanbul and GZT for Gaziantep), age, and, if applicable, grade levels for students, were provided. In the case of adult participants, information pertaining to their educational attainment and professions was disclosed.

Official approvals for data collection were obtained from the Ministry of National Education and the Ankara University Directorate of Ethical Council (approval dated 30.06.2022 and decision number 33). Furthermore, an informed consent form from parents or guardians was secured to administer surveys and conduct interviews.

**Data collection instruments**

The data was collected from participants who attended the European Researchers' Night event through data collection instruments comprising questionnaires and interview forms. These data collection instruments were meticulously refined after undergoing a process of expert evaluation. Separate questionnaires and interview forms were developed to cater to the distinct participant groups.

**Questionnaires**

Quantitative data were collected through questionnaires developed by the researchers. Questionnaires were created by scanning the relevant literature for research purposes. Additionally, the development of the questionnaires was inspired by the measurement instruments used in previous Night events (ERNEst21; G9Night; EXPLORATHON 2021). Questionnaires were developed according to age and grade variables as Primary, Secondary, High School and adult questionnaire forms. The Primary School questionnaire encompassed 11 items, while the Secondary School questionnaire comprised 17 items. The High School and adult questionnaires each featured 17 and 15 items, respectively. In the questionnaires, participants were asked about topics such as their motivation to attend the festival, how they would rate the quality of the event, their opinions about research, researchers, and being a researcher, the impact of science on daily life, whether their interest in science increased, whether the event influenced their future occupational decisions, whether they would attend similar organizations in the future, how much fun they had during the events, how relevant the events were to their age and interests, how relevant the context, communication, and materials were, and how they would rate the organizational aspects such as timing, supporting personnel, and transportation.

The response format of the Primary and Secondary School questionnaires was configured as a 3-point Likert scale, wherein participants rated statements as '1- do not agree,' '2- somewhat agree,' and '3- agree.' In contrast, the High School and adult questionnaires employed a 5-point Likert scale, allowing participants to express their agreement using options '1- strongly disagree,' '2- slightly agree,' '3- partially agree,' '4- strongly agree,' and '5- completely agree.'

It is necessary to examine simultaneously whether the questionnaires measure consistently or whether there is consistency between the questionnaire items. Internal consistency reliability is used extensively in social sciences to test the consistency of the questionnaire items internally. In order to establish the internal consistency and reliability of the questionnaires used in this study, the Cronbach's Alpha coefficient was computed. In line with prevailing literature, it is generally expected that a Cronbach's Alpha coefficient should be at or above 0.70 to deem a scale reliable (Pallant, 2001). According to an alternative perspective, coefficients below 0.40 imply a lack of reliability, those between 0.40 and 0.60 indicate low reliability, and those between 0.60 and 0.90 signify high reliability (as per Özdamar, 1997, cited in Tavşancıl, 2010). In this context, the Cronbach's Alpha reliability coefficients for the questionnaires were determined to be 0.61 for the Primary School questionnaire, 0.80 for the Secondary School questionnaire, 0.88 for the High School questionnaire, and 0.88 for the adult questionnaire.

### The Interview Form

Qualitative data were collected with a semi-structured interview form developed by the researchers. The interview form was created by scanning the relevant literature for the purposes of the research. The developed draft interview forms were sent to the opinion of four field experts. The recommendations from experts in fields such as curriculum, educational administration, primary education, and science education were evaluated collaboratively with the researchers and the consultant, after which the interview form was finalized, containing nine questions in its semi-structured format.

In the qualitative phase of the study, rigorous efforts were undertaken to ensure the validity and trustworthiness of the research, following the criteria of credibility, transferability, dependability, and confirmability (as outlined by Guba and Lincoln, 1985, cited in Creswell, 2016). Expert opinions were solicited for the semi-structured interview questionnaire developed by the researchers to bolster credibility. In the pursuit of transferability, the researchers utilized the maximum variation sampling method among purposeful sampling methods and furnished comprehensive descriptions to facilitate broader applicability. As a matter of fact, as Merriam (2013) suggested in qualitative studies a study group should be formed by creating an intentional variety and difference. Furthermore, participant characteristics were meticulously detailed to aid in transferability. Lastly, to ensure confirmability, the findings were anchored in participants' own statements, adhering to the approach advocated by Guba and Lincoln (1982).

The research team was divided into two groups to analyse the data obtained from the interview forms, with each group conducting separate analyses. Subsequently, the researchers convened to compare their results. Ensuring reliability in qualitative research is crucial, and Miles and Huberman's (1994) formula was employed for this purpose. It is generally recommended that the inter-rater agreement percentage be 70% or higher (Miles & Huberman, 1994). In this study, the reliability was calculated at 86%. Following this, the researchers engaged in discussions to resolve any discrepancies in coding, ultimately reaching a consensus and finalizing the coding framework.

### Data analyses

The quantitative data collected in this study were analysed using the Statistical Package Program for Social Sciences (SPSS). Prior to the analysis, a comprehensive examination of the dataset was conducted to identify and address missing data in the variables. It was ascertained that no variable contained more than 5% missing data, adhering to the guidelines set forth by Tabachnick and Fidell (2014). Univariate outliers were identified through the application of standardized z-scores. Descriptive statistics, which encompass techniques such as percentage, frequency, and arithmetic mean, were employed in the data analysis process.

For the qualitative phase of the research, NVivo 10 software was utilized. The research team was divided into two groups to analyze the data obtained from the interview forms, with each group conducting independent analyses. Content analysis was employed as the method, aimed at thoroughly exploring the data to identify underlying concepts and categories (Yıldırım & Şimşek, 2008). Following an inductive approach, participants' statements were initially coded, and categories were subsequently derived from these codes. The process of category formation involves grouping multiple codes or subcategories to establish a common pattern or idea (Creswell, 2016). Throughout the identification of subcategories, efforts were made to adhere closely to the participants' original expressions. After completing their individual analyses, the researchers compared their results, reached a consensus, and finalized the coding and categorization process. The findings were then presented in tables, with frequencies indicated and interpreted by the researchers.

## Findings

The findings of this study have been structured and presented in alignment with the sequence of the research questions. To ensure coherence and clarity, each research question is explicitly referenced in the section headings, labeled as RQ1, RQ2, etc.

**Findings of quantitative research**

The statements in the questionnaires were examined under the headings of "reasons to attend EDUCATE events", "contributions of the events to learning" and "evaluation of the activity". The findings obtained from these categories were analyzed under these headings.

**RQ1: Reasons to attend EDUCATE events**

The arithmetic averages of the answers given by the participants to the statements regarding the reasons for attending the EDUCATE events are given in Table 3.

Table 3.
Means of the Reasons to Attend the EDUCATE Events

| Reasons to attend the events | Primary School* | Secondary School* | High School** | Adult** |
|---|---|---|---|---|
| | Mean | Mean | Mean | Mean |
| I attended these events because: | | | | |
| I was interested in science. | 2.75 | 2.84 | 4.09 | 4.33 |
| I thought it would be fun. | 2.90 | 2.84 | 4.17 | 4.29 |
| I am interested in the poles. | 2.48 | 2.46 | 3.46 | 4.04 |
| My parents wanted it. | - | 1.57 | 2.07 | |
| My teacher asked me to. | - | 1.74 | 2.65 | |
| I wanted it. | | 2.87 | 4.44 | 4.51 |

*1- disagree, 2- somewhat agree, 3- agree
**1-strongly disagree, 2-disagree, 3-somewhat agree, 4-agree, 5-completely agree

As delineated in Table 3, the analysis reveals distinctive motivations underlying event participation. Specifically, Primary School students (Mean = 2.90) and High School students (Mean = 4.17) predominantly attended the events with the primary expectation of enjoying the activities. In contrast, Secondary School students indicated the highest level of participation, driven not only by the anticipation of enjoyment but also by their intrinsic interest in science. A similar pattern emerged among adult participants, emphasising their interest in science as a key motivator.

Furthermore, both Secondary and High School students conveyed that their participation in the events was voluntary and not contingent on familial or pedagogical encouragement. Likewise, the adult participants similarly emphasized that their involvement was entirely self-initiated.

**RQ2: Contribution of the events to learning**

The responses of the participants to the statements about the contributions of the EDUCATE activities to them are given in Table 4.

Table 4.
Means of the Expressions Regarding the Contribution of the Activity

| Statements related to the contribution of the events | Primary School* | Secondary School* | High School** | Adult** |
|---|---|---|---|---|
| | Mean | Mean | Mean | Mean |
| In this event, I gained new knowledge about the Poles and climate change. | 2.70 | 2.74 | 4.07 | 4.29 |
| In these events, I understood how climate change affects our daily lives. | 2.51 | 2.69 | 3.89 | 4.25 |
| After participating in these activities, I thought of becoming a scientist. / If I have the opportunity after participating in these activities, I would like to take part in a scientific study. (Adult) | 2.31 | 2.08 | 2.94 | 4.21 |
| I may use what I learned in these activities in my daily life. | - | 2.64 | 3.86 | 4.27 |
| After participating in these events, I became aware of my lack of knowledge about the Poles and climate change. | - | 2.65 | 3.73 | 4.31 |
| After participating in these events, I will be more careful about the Poles and climate change in my daily life. | - | 2.75 | 4.03 | 4.35 |

*1- disagree, 2- somewhat agree, 3- agree,
**1-strongly disagree, 2-disagree, 3-somewhat agree, 4-agree, 5-completely agree

As can be seen in Table 4, the highest mean in all groups occurred for the statement "After participating in these activities, I am more careful in my daily life about the Poles and climate change" ($M_s$ = 2,75, $M_h$ = 4,03, $M_s$ = 4,35). In other words, the event enhanced participants' awareness and significantly improved their understanding of the poles and climate change. Participants were more willing to incorporate this newly acquired knowledge into their daily lives, reflecting a meaningful learning experience.

**RQ3: Evaluation of the event**

The participants' responses to the statements containing their evaluations of EDUCATE activities are given in Table 5.

Table 5.
Means of Evaluation of the Events

| Statements related to the general evaluation of the events | Primary School* | Secondary School* | High School** | Adult** |
|---|---|---|---|---|
| | Mean | Mean | Mean | Mean |
| Participating in these events made me happy. | - | 2.87 | 4.39 | 4.56 |
| I had fun at these events. | - | 2.87 | 4.23 | 4.59 |
| I would share what I learned in these activities with my family and friends. | - | 2.83 | 4.27 | 4.72 |
| The activities were appropriate for my age and level of knowledge. | - | 2.80 | 4.21 | |
| I would attend similar events again. | 2.91 | 2.82 | 4.33 | 4.51 |

*1- disagree, 2- somewhat agree, 3- agree
**1-strongly disagree, 2-disagree, 3-somewhat agree, 4-agree, 5-completely agree

All participant groups, namely Secondary School (Mean = 2.87), High School (Mean = 4.23), and adult (Mean = 4.59) cohorts, reported deriving enjoyment from their participation in EDUCATE activities. Notably, Secondary School students (Mean = 2.83) exhibited a slightly lower level of enjoyment compared to High School (Mean = 4.27) and adult groups (Mean = 4.72), with the latter two cohorts expressing a greater inclination to disseminate the knowledge acquired during the activities to their respective social circles. Moreover, both Secondary School (Mean = 2.80) and High School students (Mean = 4.21) demonstrated a high degree of agreement regarding the suitability of the activities in relation to their age and level of knowledge.

In a unanimous consensus, all participants expressed a positive disposition toward partaking in similar activities in the future.

**Findings of qualitative research**

Categories that emerged after the analysis of data obtained from the interviews are shown in Figure 1.

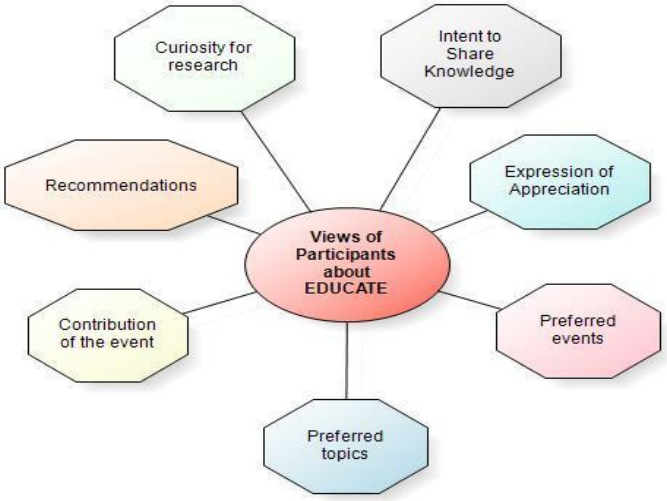


Figure 1. Categories from Interviews on EDUCATE

As illustrated in Figure 1, the analysis of the interview data was categorized into several distinct categories: preferred events, preferred topics, expression of appreciation, contributions of the event, curiosity for research, intent to share knowledge with others, and suggestions. In the following sections, each of these categories will be introduced and discussed in detail, with individual sub-topics presented as separate headings under the relevant research problem to provide a clear and organized structure to the qualitative findings.

**RQ4: Preferred events**

The views of the visitors who attended the EDUCATE events about the most favorite events are given in Table 6.

Table 6.
Events Preferred by the Participants

| Categories | Sub-Categories | f | Statements of the interviewees |
|---|---|---|---|
| Fun events | Painting and spinning tops | 20 | P28: We liked spinning tops, seeing children's previous games and the games of our childhood (F, GZT, 38, Primary, Housewife). |
| | Recycling activities | 19 | P53: It is nice that they produce fuel from fruit waste at one of the stands. (M, GZT,43 Undergraduate, Teacher)<br>P58: We planted plants in the soil, melon plants, for example, the fertilizer production that we did, actually attracted my attention. (M, GZT, 14, Student, 9th Grade). |
| | Technology events | 13 | P59: Gaziantep University had the most electric car in the festival area, and it caught my attention more. (M, GZT,14, Student, 9th Grade)<br>P1: I was most interested in making a penguin with a 3D printer. (F, GZT, 11, Student, 6th Grade) |
| | Jumping activity | 2 | P40: The activity of TÜBİTAK to create earthquakes by jumping was good. (M, IST, 17, Student, 11th Grade) |
| Scientific events | Conferences | 18 | P41: A teacher's presentation about plastics caught my attention. After that, I was very interested in the presentation of a teacher who stayed at the Polish base. (M, IST, 16, Student, 11th Grade)<br>P24: Scientists who give conferences know their subjects. They can easily answer any question we ask. Children have the chance to learn and practice directly, thanks to their face-to-face meetings with the people who want to do scientific research. Thank you for your hard work. (F, GZT, 45, Graduate, Biologist) |
| | Science truck | 8 | P51: We examined living things under the microscope in the science truck, I liked it very much. I liked everything inside the truck. (F, GZT, 16, Student, 11th Grade)<br>P59: I learned more comprehensive knowledge about the displacement and formation of the continents in the world in the truck. (M, GZT, 14, Student, 9th Grade)<br>P42: We watched space-related things in the truck the most, and I liked it. (F, IST,17, Student, 11th Grade) |
| | Astronomy workshop | 5 | P49 The event is very nice. We learned a lot. They showed the sun. We just looked there (in the telescope) (F, GZT, 16, Student,11th Grade) |
| | İTÜ student group activity | 2 | P45: I liked Postim's Good Week event. I think the card game is very instructive. There is a network tower event at the Istanbul Technical University Polar Studies Club. They create digital memories, I find them very successful. (M, IST, 21, University Student) |

When Table 6 is examined, it is possible to say that painting and spinning top activities, recycling activities, and conferences attracted a lot of attention.

**RQ4: Preferred topics**

Participants expressed a distinct preference for topics related to polar regions, with a total of 30 participants' views indicating a heightened level of interest. The following are illustrative examples of participants' opinions on this topic.

> My particular interest was drawn to Antarctica, the wildlife inhabiting these polar regions, the polar boundary, and polar bears (P44, Male, Istanbul, 16 years old, Student, 11th Grade).
> I harbor a strong desire to engage in scientific pursuits, especially as a cartographer, with a specific interest in participation in polar expeditions (P45, Male, Istanbul, 21 years old, University Student).

In addition to their polar-related interests, participants also expressed a genuine enthusiasm for climate-related subjects. For instance, Participant 37 attended the EDUCATE event due to a deep-seated interest in climate change and environmental issues, sharing that they have initiated an environmental team with fellow students at their school, with a focus on launching an environmental project (Female, Istanbul, 15 years old, Student, 10th Grade). Similarly, Participant 45 expressed a desire to create thermal maps of polar regions to examine temperature fluctuations and the impacts of global warming (Male, Istanbul, 21 years old, University Student).

**RQ4: Expression of appreciation**

Upon analyzing the participants' responses to inquiries about their views of the activities, it is evident that all participants consistently held highly favorable views. The interviewees' answers to the question of how did you find the activities are given in Table 7.

Table 7.
Interviewees' Expressions of Appreciation

| Categories | f | Statements of the interviewees |
|---|---|---|
| Satisfaction and Positive Evaluation | 60 | P12: I found the event very nice. There were many good activities. I am very happy to devote my time to these activities. (F, GZT, 12, Student, 6th Grade)<br>P16: The activities were good and we learned new things. A trip made by our school. It was really nice to combine so many topics into one. (M, GZT, 14, Student, 8th Grade)<br>P36: The event was well evaluated and well organized. It has a large number of participants. I think it is a good organization to appeal to young minds in order to popularize polar science studies. (M, IST, 29, Researcher, Undergraduate Degree)<br>P38: I think the activities are good, appropriate for our age. (F,IST,14,Student,9th Grade) |
| Fun and Enjoyment | 16 | P58: It's actually pretty good. There's an event everywhere and it's free. We can do what we want. I had so much fun in two days. If it happens again, I would prefer to come again. (M, GZT, 14, Student, 9th Grade)<br>P44: The event was very good, it was entertaining and informative. (M, IST, 16, Student, 11th Grade)<br>P52: The event is very good for children, we had a lot of fun, we enjoyed it. (F, GZT, 51, Housewife) |
| Educational and Informative | 11 | P42: I found the event nice, it was informative. Good, I use it in daily life. (F, IST,17, Student, 11th Grade)<br>P8: It was both impressive and instructive. (F, GZT, 14, Student, 7th Grade)<br>P17: We are both having fun and being informed. It's so much fun. (M, GZT, 13, Student, 7th Grade) |
| Impact and Contribution of the Event | 6 | P17: It was very entertaining and very useful. (M, GZT, 13, Student, 7th Grade)<br>P53: I think it is very effective and useful. I think it would be great for all people to participate in these events. (M, GZT, 43, Teacher, Undergraduate Degree) |
| Interest and Impressiveness | 5 | P56: Actually, it is a nice, useful and interesting activity. (F, GZT, 40, Paramedic, Undergraduate Degree) |

When Table 7 is examined, these statements collectively underline participants' predominantly favorable reception of the events, with activities being perceived as engaging, enjoyable, and instructive.

**RQ5: Contribution of the event**

The views of the participants related to the statement "contributions of the EDUCATE activity" are given in Table 8.

Table 8.
Contribution of the event

| Categories | f | Statements of the interviewees |
|---|---|---|
| Learning New Knowledge | 34 | P5: I learned new things about animals and climate change. (F, GZT,10, Secondary School Student, 5th Grade)<br>P10: We pollute nature a lot and this affects the climate a lot. Since we need to prevent this, we can try to do something. In fact, after today, I will be much more careful. (F, GZT, 13, Student, 6th Grade)<br>P60: I have a lot of knowledge about Zero waste. There was a throwback activity. It was nice. We learned many things. (F, GZT,14, Student, 9th Grade) |
| Reinforced Knowledge | 15 | P45: My opinion about the poles was strengthened. I was already interested. It was very nice. (M, IST, 21, University Student, Undergraduate Degree)<br>P59: I already had knowledge about climate. I learned more useful things from the science truck here. I learned more comprehensive information about the formation of the continents in the world. (M, GZT,14, Student, 9th Grade).<br>P35: I think I am already conscious about this issue. I pay a lot of attention to climate change etc. This area was an area that I was interested in, so it gave me more information. (F, IST, 16, Student, 11th Grade) |
| Raising Awareness | 14 | P26: It is better to know the value of water and green. How can we protect it? what should we do? (M, GZT, 39, Technician, High School)<br>P21: I became more conscious about the poles. I understood better that we need to protect them. (M, GZT, 12, Student, 6th Grade)<br>P58: Here, I learned to avoid waste. This is because it is a situation that indirectly affects the climate. (M, GZT, 14, Student, 9th Grade) |
| Increasing Motivation | 12 | P37: After this event, I plan to participate in scientific activities. These can be workshops or forums. (F, IST, 15, Student, 10th Grade) |
| Useful for the new generation | 10 | P45: Polar awareness training caught my attention. I find it very valuable that people in the younger age group understand this and pass it on to future generations. (M, IST, 21, University Student)<br>P36: I think it is a good organization to appeal to young minds to popularize polar science studies. (M, IST, 29, Researcher, Undergraduate Degree)<br>P57: Actually, I'm not a very scientific person, but when my children see space, stars, and falling stars through a telescope, we are happy when they get excited. (F, GZT, 43, Teacher, Undergraduate Degree) |
| Generating new ideas for the future | 10 | P1: The poles melt as a result of methane gas. We are making a project to prevent this. There may be a new project after the event here. (F, GZT, 11, Student, 6th Grade)<br>P37: I came to the EDUCATE event because I am interested in climate change and environmental issues. I formed an environmental team with my friends at my school. We want to start a project about this environmental team. I attended the event to think about the projects that our team can do and to develop ideas. (F, IST, 15, Student, 10th Grade)<br>P40: We wanted to research the topography of the poles and geomorphological observations, and we plan to continue this at TUBITAK Marmara Research Institute. (M, IST, 17, Student, 11th Grade) |

As can be seen in Table 8, the interviewees stated that they learned new knowledge through the activities and became more sensitive to these issues. They also stated that the activities enabled them to generate new ideas.

**RQ5: Curiosity for research**

The views of the participants related to the statement "curiosity for research" are given in Table 9.

Table 9.
Curiosity for Research

| Category | f | Statements of the interviewes |
|---|---|---|
| Poles | 28 | P41: Personally, when I want to go to the pole, I wonder about the living things there. The geographical formations of the ratio are very interesting to me. I used to do more research on them. (M, IST, 16, Student, 11th Grade)<br>P44: I would like to participate in a research event on the history of Antarctica. (M, IST, 16, Student, 11th Grade)<br>P41: I would like to participate in scientific studies on Antarctica. I would like to do fieldwork. (M, IST, 16, Student, 11th Grade) |
| Climate change | 20 | P36: I would like to do research on climate change and sustainability. (M, IST, 29, Researcher, Undergraduate Degree)<br>P35: I would like to research animal species that have disappeared due to climate change. (F, IST, 16, Student, 11th Grade)<br>P54: If I had the opportunity to research, I would research climate change. Waste is a sensitive subject for me, recycling of waste is very different, I would like to work on it the most. (F, GZT, 32, Housewife) |
| Scientific activities | 16 | P8: I would definitely like it. I would like to learn science better. (F, GZT, 14, Student, 7th Grade)<br>P37: I am currently taking part in many scientific activities. I am thinking of participating in scientific activities after this event. (F, IST, 15, Student, 10th Grade) |
| Animals | 13 | P20: I would like to. I would like to do research on animals living in the poles.<br>P35: I like biology very much as a course. That's why I would like to participate in nature-related activities. (M, GZT, 7, Student, First Grade)<br>P38: Maybe I would like to do research on endangered animals. (F, IST, 14, Student, 9th Grade)<br>P46: I would like to do research on animals living in the poles. I would like to do research on the creatures that live there. (F, IST, 17, Student, 12th Grade) |
| Space and astronomy | 6 | P43: I would like to research unknown planets. I would like to do research on astronomy. (F, IST, 16, Student, 11th Grade)<br>P38: I would like to take part in studies related to space. (F, IST, 14, Student, 9th Grade)<br>P49: Yes, I would. I want to go into space and do research. (F, GZT, 16, Student,11th Grade) |
| Technology | 2 | P1: I participated in TÜBİTAK Teknofest. I would like to participate in studies on robots. (F, GZT, 11, Student, 6th Grade) |
| Social | 1 | P42: I would rather do scientific activities on social issues. (F, IST,17, Student, 11th Grade) |

When Table 9 is examined, the participants exhibit a predominant interest in the investigation of polar regions and climate change. Beyond these focal areas, participants also express a keen desire to explore various topics encompassed within educational activities, such as astronomy, space, robotics, biology, and the study of animal species.

**RQ5: Intent to Share Knowledge**

It is noteworthy that participants expressed an intent to disseminate newfound knowledge to others. Participants' statements serve as illustrative examples:

> My primary action upon returning to school will be to share the knowledge I acquired here." (P12, Female, Gaziantep, 12 years old, Student, 6th Grade).
> I intend to inform my neighbors, as they also have children, and I wish to encourage them to visit and witness this event." (P52, Female, Gaziantep, 51 years old, Housewife).
> I aspire to encourage my peers to visit this venue. It is my belief that visiting this place has the potential to transform people's perspectives." (P53, Male, Gaziantep, 43 years old, Teacher, Undergraduate Degree).

**RQ6: Suggestions**

Suggestions from the participants about the EDUCATE activity are given in Table 10.

When Table 10 is examined, it can be concluded that the participants wanted to have more variety of events, to attend such events more frequently, to learn about the Poles in school subjects, and to hear about the event more effectively.

Table 10.
Suggestions of the participants

| Categories | Sub-Categories | f | Statements of the interviewees |
|---|---|---|---|
| Content | More variety of events | 8 | P3: More clubs coming, and better things happening. (M, GZT, 10, Student, Primary 4th Grade)<br>P4: I think there should be more diverse activities. Enlarge the stands. (M, GZT, 14, Student, 9th Grade) |
| | Recommendations for the contents of the events | 4 | P21: Photos of animals could have been posted more. (M, GZT, 12, Student, 6th Grade) |
| Organization | Announcing the event more effectively | 6 | P24: I expected the announcements to be made differently in this environment. (F, GZT, 45, Biologist, Graduate Degree)<br>P27: It would be great if it reaches more people. (M, GZT, 44, Medical Personnel, Undergraduate Degree) |
| | Recommendations for the event area | 6 | P35: Activities can be done in a larger area. (F, IST, 16, Student, 11th Grade)<br>P37: I just came to the event, it is a very nice and friendly environment. Just a little crowded. Due to the crowd, we did not have the opportunity to talk to the people in the workshop much. Other than that it's a good event. (F, IST, 15, Student, 10th Grade) |
| Duration | Organization of similar events | 6 | P26: It would be better to have this event twice a year, if possible, rather than once in a while. (M, GZT, 39, Technician, High School Graduate)<br>P53: It is good that such activities are carried out frequently. (M, GZT, 43, Teacher, Undergraduate Degree) |
| | Longer time for the events | 2 | P19: Its duration should have been extended further. (M, GZT, 11, Student, 5th Grade). |
| Other | Course subjects in the curriculum about the Poles | 1 | P15: Things about climate change are in social studies class. From there, we satisfy our curiosity. There are no lessons about the poles. We are more curious about the poles where there is nothing about poles in Social Studies and Science classes. (F, GZT, 12, Student, 7th Grade) |

The qualitative findings from the EDUCATE project interviews were organized into distinct categories, each representing different aspects of participants' experiences. The most preferred events included interactive and fun activities, such as painting, spinning tops, and recycling workshops, which garnered significant attention. Participants also expressed a strong interest in polar regions and climate change topics, indicating a heightened awareness and concern for environmental issues. Many participants appreciated the educational value of the events, with some expressing a newfound curiosity for research, particularly in areas such as polar exploration, climate change, and scientific activities. The activities were also seen as impactful, fostering an intent among participants to share the knowledge they acquired with others. Suggestions for future events included calls for a greater variety of activities, better organization, and more effective communication to reach a broader audience. Overall, the qualitative data highlights the positive influence of the EDUCATE events on participants, particularly in enhancing their awareness and motivation to engage in scientific inquiry.

## Discussion, Conclusion, and Suggestions

Since it began in 2005, museums, universities, and science centers have organized EDUCATE events across Europe, covering more than 300 locations. Notably, in 2022, these events exhibited a substantial presence in Istanbul, the most populous city in Türkiye, as well as Gaziantep, another prominent urban center. Those who participated in the EDUCATE event reported a heightened interest in scientific research, particularly in the main themes of polar regions and climate change. Additionally, they indicated a greater awareness and expressed a stronger enthusiasm for engaging in such research and

pursuing careers as scientists. These findings are consistent with those of Martini et al. (2022), who found that similar events, organized across more than 20 Italian cities during the European Researchers' Night coordinated by Frascati Scienza, effectively encouraged young people to consider scientific careers by generating a tangible impact on their engagement with science. This parallel underscores the broader impact of European Researchers' Night events in fostering scientific curiosity and motivating the next generation of scientists. Furthermore, as Arnoe et al. (2016) highlighted, these night events' primary objectives include raising public awareness of researchers' work, fostering dialogue between researchers and citizens, and inspiring young individuals to pursue careers in science. Similarly, Mazitelli et al. (2018) reported that participants, particularly young people, although not necessarily aspiring to become scientists, felt satisfied and motivated to engage with science, expressing enthusiasm for experiencing and interacting with scientific activities.

Evaluating science communication activities is a challenging task that demands managing complex information flows and relationships among subjects from whom a change is expected. This complexity is particularly evident in large-scale events like the European Researchers' Night (EDUCATE), where ambitious goals are often set (Pellegrini, 2021). The Ministry of National Education, in conjunction with the municipalities of Istanbul-Tuzla and Gaziantep, provided requisite permissions, as well as issued announcements and extended transportation facilities. Such collaborative efforts synergized multiple stakeholders to facilitate the attendance of a considerable number of students. Consequently, these inter-institutional alliances have ensured unfettered access and participation in the events for individuals with a keen interest. This strategic approach has effectively mitigated the apprehensions raised by Bultitude (2014) regarding the potentially exclusive nature of participation in such events. As a result, it is evident that participation in these scientific events, supported by the Ministry of National Education and local municipalities in Türkiye, is likely to be high. Therefore, future organisers of similar events should consider more effective guidance for students and more active involvement in the activities. It is recommended that university students assume leadership and mentorship roles, providing guidance to secondary school students throughout the activities. Given the large number of participants, our observations suggest that better organization of the event area could prevent overcrowding in certain sections, thereby allowing each participant to engage more fully in all activities.

The events held for school students were met with considerable enthusiasm, particularly with regard to the interactions with researchers. The research findings indicate that most participants expressed enjoyment of the event, perceived it to be of high quality, and indicated a desire to attend similar events in the future. This is consistent with the findings of previous years' night events. For example, Arnoe et al. (2016) examined the results of night events held between 2006 and 2015. They found that approximately 85% of participants evaluated the events positively and around 98% expressed a desire to participate in such events again. Similarly, the ERNEst 2021 event revealed that both adults and students expressed a strong interest in visiting laboratories (adults – 63%, students – 52%) and workshops (adults – 62%, students – 58%) as part of future European Researchers' Nights. Additionally, the G9NIGHT 2021 event demonstrated that 82.2% of participants believed that such events should be held more frequently. For this reason, it would be beneficial for future training to include practice at explaining what it is like to be a researcher and how the job works. This should draw on not just personal experience but also the sorts of examples provided by career guidance counsellors. This may facilitate students' comprehension of the multiplicity of pathways that lead to a career in research, beyond the conventional single route.

The spectrum of participants in the event is quite diverse. While the majority consists of students ranging from elementary school to university levels, participants also include parents of students as well as individuals from various professional backgrounds. This diversity is significant in terms of the widespread impact of the event. Although not officially noted, migrant students have also been part of the event. This further contributed to ensuring inclusivity within the event. Notwithstanding Arnstein's (1969) hierarchical framework of citizen participation, these events are characterized as exemplars of public engagement in the literature. This paradigm shift toward public engagement is underscored by institutional support.

Both participants from Istanbul and Gaziantep have expressed their appreciation for the events, their desire for more similar activities to be organized, and their increased interest and awareness in scientific

research, and research on polar and climate change through European Researchers' Night events. Additionally, participants often emphasized that announcements that are more effective would increase participation in the events. This result is consistent with the statement “The opportunities for social learning provided by public engagement events are becoming more important to the role of science in society” (Davies et al., 2009). The events organized within the EDUCATE project enhanced public awareness and knowledge of climate and polar science. By aligning with established research on climate change education, these events successfully bridged the gap between scientific knowledge and public understanding, thereby contributing to a more informed and engaged public in addressing climate-related challenges.

**Limitations to the Research**

It is recommended that future research outcomes be enhanced by conducting a comparative analysis of participants' perspectives on scientific research, polar issues, and climate change before and after their participation in the European Researchers' Night event. A longitudinal study of the same individuals before and after the event would have enabled a detailed examination of any changes in their responses. Nevertheless, the considerable number of participants in both urban centers rendered this approach impractical.

Furthermore, the questionnaires and interview protocols were deliberately constructed with a restricted number of items and questions. This limitation was necessary due to the anticipated large-scale participation, in order to guarantee the feasibility of data collection during the event. In addition, measurement tools with completed validity and reliability studies can be developed and used in such activities.

**Recommendations for Future Work**

The participation of primary school students in the EDUCATE event was limited, primarily due to the challenges of managing young children in a crowded environment. Based on these observations, it may be more effective in future events to have primary school students participate separately from other groups, perhaps during earlier hours. Additionally, collecting data from primary school students through interviews may be more appropriate given their age and comprehension levels.

While this study assumed a homogeneous participant group of Turkish citizens, inclusive educational practices suggest the importance of considering the diverse populations present in Türkiye, including Syrian refugees. Although no direct data on this group was collected in this study, the inclusion of such populations in future research is strongly recommended. This would enable a more comprehensive understanding of educational needs and foster inclusive practices that address the challenges faced by refugee youth.

In summary, these recommendations emphasize the importance of enhancing student engagement, improving event organization, and adopting inclusive practices that account for the diverse populations in Türkiye, ensuring that future initiatives are more effective, accessible, and reflective of the country's demographic realities.

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**Ethics statement:** In this study, we declare that the rules stated in the "Higher Education Institutions Scientific Research and Publication Ethics Directive" are complied with and that we do not take any of the actions based on "Actions Against Scientific Research and Publication Ethics". At the same time, we declare that there is no conflict of interest between the authors, which all authors contribute to the study, and that all the responsibility belongs to the article authors in case of all ethical violations.

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