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Developing students' geographical culture through the integration of tourism in geography education in Kazakhstan

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Abstract

This study explores the role of integrated tourism education in promoting geographic culture among students in Kazakhstan. It examines the combination of theoretical knowledge with practical tourism activities and modern educational technologies, including GIS, Augmented Reality (AR), and Virtual Reality (VR). The research involved 119 geography teachers and 172 students (aged 15-18) from two schools in Almaty. Methods included curriculum analysis, pedagogical experiments, surveys, and observations. The results show that integrated learning, especially ICT-based approaches, improved students' spatial thinking and geographical awareness by 40% compared to traditional methods. Teachers recognized the benefits of digital tools in geography education, but 65% reported that challenges such as limited internet access and a lack of interactive whiteboards hindered implementation. The study concludes that the integration of geography, tourism, and digital technologies is crucial for the development of students' geographical culture. However, addressing technical infrastructure issues and providing comprehensive teacher training in digital tools is essential for effective implementation.

Keywords: Digital technologies, geographic culture, geography, integrated education, Kazakhstan secondary school students, tourism education.

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1. Introduction

If there is little knowledge of tourism in the basic education system, it indicates a lack of competitiveness in the tourism sector, given the growing socio-economic importance of the country. Therefore, as a key element of the strategy to increase

the competitiveness of the tourism sector, it is necessary to strengthen tourism education in general education schools [1]. In terms of intellectual and physical resources, management policies, and institutional changes, tourism education has also faced various challenges [2]. There is a significant gap in how geography teachers of tourism education apply pedagogical methods when teaching tourism concepts. This highlights the need to further explore the extent of their application [3].

Teaching about tourism in schools is becoming increasingly important for several reasons: tourism education is undergoing a major transformation worldwide, with approaches, strategies, and programs being re-evaluated to make tourism and hospitality schools more attractive to potential students and more relevant to the needs of the hospitality industry [4] integrating tourism knowledge into the curriculum, especially at the primary school level (years 7 to 9), can enable students to better understand the spatial dynamics and economic, social and cultural aspects of tourism; school-based tourism education can be a strategy to increase students' knowledge, awareness, and appreciation of local tourism resources and to strengthen their cultural identity; the development of tourism-related core competences, such as application and knowledge creation, can positively influence students' creative self-efficacy and innovative behavior [5] the mismatch between the skills and knowledge of tourism and hospitality graduates and those expected by the industry can be addressed by integrating tourism knowledge into the curriculum [6]. This is the case for the teaching of tourism to schoolchildren, since tourism is not a specific subject. The knowledge about tourism gained in geography has a great influence on the formation of geographical culture in schoolchildren. Maksakovsky's [7] book was the first work that presented the concept of geographical culture in a detailed and comprehensive way and analyzed the concepts of geographical culture in modern school geography in terms of its general state and ways of improvement. Maksakovsky demonstrated that geographic culture consists of 4 components: geographic image of the world, geographical thinking, language of geography (map), and methods of studying geography. Many researchers also note in their works the importance of teaching geographical culture through teaching geography [8, 9] and about the formation of geographical culture [10].

Spatial thinking is a key component of geographic culture, expressed through geographic language and maps. As spatial thinking plays an important role in solving stereometric problems in mathematics, its development in geography can be enhanced by digital resources and integrated teaching methods. The study by Abylkassymova et al. [11] indicates that the use of digital technologies significantly improves students' spatial thinking, confirming the effectiveness of such approaches in teaching both geography and mathematics.

Integrated learning, combining geography and mathematics, promotes the development of spatial thinking as a key component of geographic culture. Research shows that STEM education significantly increases students' cognitive activity, critical thinking, and academic achievement through the integration of science, technology, engineering, and mathematics. Similarly, the use of digital resources and integrated methods in the teaching of geography and mathematics enhances analytical and spatial skills, making learning more meaningful and practical [12].

Knowledge of tourism in geography is an effective educational technology, which is actively used in domestic and international practice, and students form a geographical culture: universal socio-personal and general cultural qualities (gnostic, moral-electoral, communicative, organizational, image competences) [13].

Independent and creative application of knowledge, skills, and abilities of the subject in life situations, field practice, tourism, and work with different sources of knowledge is supported by integrated teaching that demonstrates the “universality” of geography, i.e., its connection with literature and mathematics, foreign languages and social sciences, history and economics, chemistry and biology, and it is also necessary to use the study of local historical material [14].

When studying countries and different territories through the integral teaching of a tourist worldview to develop students' skills such as communication, internationalism, and the formation of geographical culture, this contributes to understanding the complexity and diversity of people's lives and increases interest in geography [15]. Integrated tourism education in schools involves the development of a comprehensive curriculum and education system tailored to the needs of the tourism sector. The educational content system should be developed taking into account the key labor market requirements for graduates' competencies in tourism management, with an emphasis on integrated problem-based learning. An integrated tourism education model can be developed to promote entrepreneurship by empowering student associations and using both human and artificial resources to create tourism education, entertainment, and recreation packages [16]. Introducing interdisciplinary integration into tourism education allows for better integration of different disciplines into practice and the development of students' core competencies, for example, by focusing on the objectives of promoting virtues through education.

Problem-based and group-based methods are effective in the integrative training of Kazakh tourism [17]. Ineffective aspects of tourism training: Issakov et al. [18] in their study specifically indicated the lack of funding and resources to implement methods of effective tourist trip organization in teaching local history. Thus, despite the potential benefits of practical training in tourism, financial and logistical constraints limit its full implementation in the educational process. Therefore, there is a need to develop alternative approaches and strategies that effectively integrate tourism education even in resource-constrained settings.

The purpose of this paper is to explore and apply integrated teaching methods to develop students' geographic culture in tourism geography education. This study highlights the importance of interdisciplinary approaches that combine tourism geography with digital technologies, problem-based learning, and experiential methods to develop students' spatial thinking and practical skills.

In modern education, the integration of geography and tourism plays a key role in improving students' geographic literacy and awareness of their cultural and natural heritage. Using interactive and digital tools such as GIS technology, virtual modeling, and augmented reality, teachers can create immersive learning experiences that go beyond the traditional classroom. In addition, fieldwork and group projects allow students to apply theoretical knowledge in a real-world setting, strengthening their problem-solving and critical thinking skills. However, issues such as a lack of funding and limited

resources to organize tourist trips remain a major obstacle. Overcoming these challenges requires innovative pedagogical solutions, including virtual tours, collaboration with local tourism organizations, and the use of digital mapping tools. By implementing such integrated educational strategies, teachers can effectively develop students' geographical culture and prepare them for future professional and academic activities in the field of tourism geography.

2. Literature Review

The rapid development of computer technology has been widely used to enhance geographical education, particularly in the teaching of environmental science, remote sensing, and geomorphology courses [19]. As noted by Jong et al. [20] in their study on virtual interactive expedition, the Learner Immersed Virtual Interactive Expedition (LIVIE), which integrates virtual research fieldwork into the study of physical geography, was conducted in Hong Kong. The study, which involved 566 students, found several positive effects on academic performance.

The use of computers and virtual interactive tools to teach geography is becoming increasingly important. There are several reasons for this:

- The use of multimedia technologies such as computer modelling, digital models, and interactive media can help students to better assimilate and understand course content related to tourism and geography [21, 22];

- Geographic information systems (GIS) and other geo-technical tools can be integrated into geography teaching to provide students with interactive and engaging learning experiences [23];

- Virtual reality and augmented reality technologies can be used to create immersive and interactive learning environments for tourism and geography education, allowing students to explore and manipulate virtual environments [24].

The integration of these computer technologies and virtual interactive tools into geography and tourism education can lead to increased student engagement, better understanding of course content, and improved teacher-student collaboration. Digital technologies such as geographic information systems (GIS), 3D maps, and augmented reality (AR)/virtual reality (VR) are increasingly being used to teach travel geography [25-27]. The use of digital technologies to teach travel geography is increasing:

- GIS and geospatial technologies have transformed the learning process and deepened students' understanding of geography, providing opportunities for spatial analysis, data visualization, and collaborative learning [28].

- Virtual and augmented reality technologies have been used to recreate historic townscapes and landmarks, increase visitor awareness of destinations, enhance the visitor experience, and increase visitor satisfaction [29].

Integrating these innovative technologies into geography education allows students to develop critical thinking, spatial reasoning, and a holistic understanding of the world around them [26]. However, the introduction of these digital technologies into geography education still faces some challenges, such as the underutilization of GIS technologies, the occasional use of virtual reality and augmented reality (AR), and the lack of technological accessibility and pedagogical support [30]. To address these challenges, researchers have developed methods and materials for GIS education, including online open-source materials, web-based GIS applications, and the integration of drones, 3D printers, augmented reality, and virtual reality [31].

Integration is the process of bringing together separate sciences and discovering related aspects in nature, society, technology, man, culture, and art. Technology is an integrative field of education that synthesizes scientific knowledge from different disciplines and reveals its application in human activities [32, 33]. The integration of computer science and geography has a significant impact on the formation of geo-graphical culture among students [34-37]. The use of computer technologies, such as GIS and Web GIS, makes it possible to activate the educational process and increase students' motivation and cognitive interest in geography [38]. The integration of geography and informatics contributes to the development of students' spatial thinking and cartographic culture, as well as to their self-education and creative thinking [39]. The organization of thematic weeks in geography using innovative teaching methods and tools allows us to unleash the creative potential of teachers and increase students' interest in studying geography [40]. Thus, the integration of informatics and geography has a positive impact on the formation of geographical culture among students and contributes to the development of their cognitive, creative, and communicative skills.

A research by AlAli and Al-Barakat [41] evaluates the effectiveness of social studies curricula in raising tourism awareness among high school students in the Irbid region of northern Jordan. The study found significant gaps in the curriculum, particularly the minimal emphasis on practical learning experiences and the lack of career orientation in tourism. The study recommends a comprehensive review of the curriculum to include specialized tourism concepts, practical learning opportunities, and career exploration activities that will prepare students for future roles in the tourism industry. Petrovets et al. [42] and Arcodia et al. [43] conducted a study on which tourism-focused learning activities can significantly deepen students' geographical knowledge and practical skills. Extracurricular activities such as field trips, hiking, and local history excursions allow students to consolidate and deepen the knowledge and skills acquired in geography classes. Educational tourism and hands-on learning through field trips can enhance students' perception and understanding of geographical concepts. Tourism and local history activities in schools can become a factor in the socialization and development of geographical knowledge and skills of younger students. Integrating tourism learning activities into the geography curriculum can help students gain a deeper understanding of geographical concepts and acquire practical skills such as map reading, compass use, and local signage. These activities can also increase students' interest and motivation to study geography, which is crucial for their overall academic and personal development [44].

The integration of computing and geography in education is crucial for developing a systematic understanding of the spatial organization of the world and natural processes. Digital tools such as GIS, 3D Maps, and augmented reality (AR/VR) technologies help students analyze and model geographic features and deepen their spatial representations. Tourism-oriented education also contributes to the development of a geographical culture. Hands-on learning, such as field trips and projects,

allows students to apply theoretical knowledge in practice. Successful implementation of an interdisciplinary approach requires appropriate pedagogical conditions, digital resources, project activities, and teacher training. This integration contributes to the development of students' critical thinking, geographical culture, analytical skills, and digital literacy.

The study by Nurgazina et al. [45] evaluates the integration of artificial intelligence (AI) into geographic education in Kazakhstan and Uzbekistan, identifies problems such as low digital literacy, lack of qualified specialists, and limited access to advanced technologies. To succeed, countries must improve teacher training programs, expand digital infrastructure, and implement government initiatives. By 2030, artificial intelligence will be fully integrated into geography education, making it more modern, interactive, and practical. Artificial intelligence helps to teach geography by making GIS, 3D maps, and other digital technologies easier to understand, making learning more convenient and accessible for students.

2.1. Research Problem

Despite the growing integration of digital tools in geography education, there is still a lack of empirical evidence on their effectiveness in fostering spatial thinking, analytical skills, and geographic literacy. Traditional teaching methods may not sufficiently engage students or equip them with the practical digital competencies required for modern geographic education. This research aims to bridge these gaps by examining the impact of integrated teaching methods that incorporate computing, interactive strategies, and a tourism-oriented approach. The findings will contribute to the development of a comprehensive framework for geography instruction that enhances digital literacy and fosters geographical culture among students.

This research will aim to develop a comprehensive framework for teaching Geography across the curriculum to promote geographic culture and digital literacy among students.

2.2. Hypothesis

The integration of interactive methods and tourism-oriented approaches in geography teaching will significantly enhance students' geographical culture. This will be reflected in the development of spatial thinking, analytical skills, and proficiency in GIS and digital mapping technologies compared to traditional teaching methods.

2.3. Research questions:

1. How does the integration of digital tools in geography teaching contribute to the formation of students' geographical culture, particularly in terms of motivation, spatial thinking, and practical application of geographic knowledge?
2. Which digital technologies (GIS, 3D maps, AR/VR) are most effective in developing students' geographical culture, including their ability to analyze, interpret, and apply geographic information?
3. How does a tourism-oriented approach in geography education enhance students' geographical culture by deepening their understanding of geographic concepts and improving their practical skills?
4. What pedagogical and infrastructural conditions are necessary for the successful formation of students' geographical culture through an interdisciplinary approach in geography teaching?

3. Materials and Methods

Kazakhstan's tourism sector has shown improved performance, ranking 52nd in the World Economic Forum's Travel and Tourism Development Index. In 2024, more than 15 million foreign visitors visited the country, of which more than 10 million stayed for more than one day. Tourists spent an average of $1,500 per trip, and fixed asset investment reached 947.5 billion tenge [46]. This means that in the future, there will be a need for employees with a background in tourism and a geographical mindset. Therefore, from now on, tourism education must be included in the school curriculum. As a result, domestic tourism, i.e., today's schoolchildren, will become Kazakhstan's future domestic tourists or educated citizens serving foreign guests.

This study used a mixed methods approach, integrating both quantitative and qualitative methods, to examine the geographical and professional characteristics of teachers and the impact of pedagogical approaches on students. A comprehensive literature review provided a theoretical foundation and analyzed previous studies on teacher categorization, student engagement, and teaching effectiveness.

The research was carried out in two schools: Public School No. 192 and Secondary School No. 81. A total of 119 teachers were studied and categorized according to age, gender, level of qualification, and geographical location (town, district center, municipality). In addition, experimental geography lessons were conducted in seven classes (grades 9-11) with 172 students aged 15-18. After the lessons, students provided feedback through structured questionnaires to assess the effectiveness of the innovative teaching methods.

Data collection included surveys, institutional records, teacher interviews, and student feedback forms. Statistical analysis, including percentage distributions and comparative estimation, was used to identify key trends. Qualitative data from teacher interviews and student reflections complemented the statistical findings and provided a deeper understanding of professional development, pedagogical effectiveness, and the formation of a geography culture in secondary schools. In addition, classroom observation was used to assess the practical implementation of innovative teaching methods and their impact on students' geographical thinking.

The research methodology, which describes the sequential stages of data collection, analysis, and interpretation, is illustrated in Figure 1. The research process is based on a structured, step-by-step approach that ensures methodological rigor and validity. It begins with a literature review, which provides the theoretical underpinning, followed by the research design, within which the methodological framework is developed. Data is then collected, sampled, and analyzed using both statistical and qualitative methods, leading to findings and interpretation, where the results are evaluated to draw meaningful

conclusions about teacher and student dynamics. This structured approach ensures a comprehensive examination of the research problem by systematically progressing from theoretical exploration to empirical analysis. The survey methodology encompassed both key stakeholders-teachers and students-allowing for a precise identification of existing challenges. By integrating multiple perspectives, the study enhances its validity and contributes to a more nuanced understanding of teacher-student interactions, ultimately informing the development of effective pedagogical strategies.

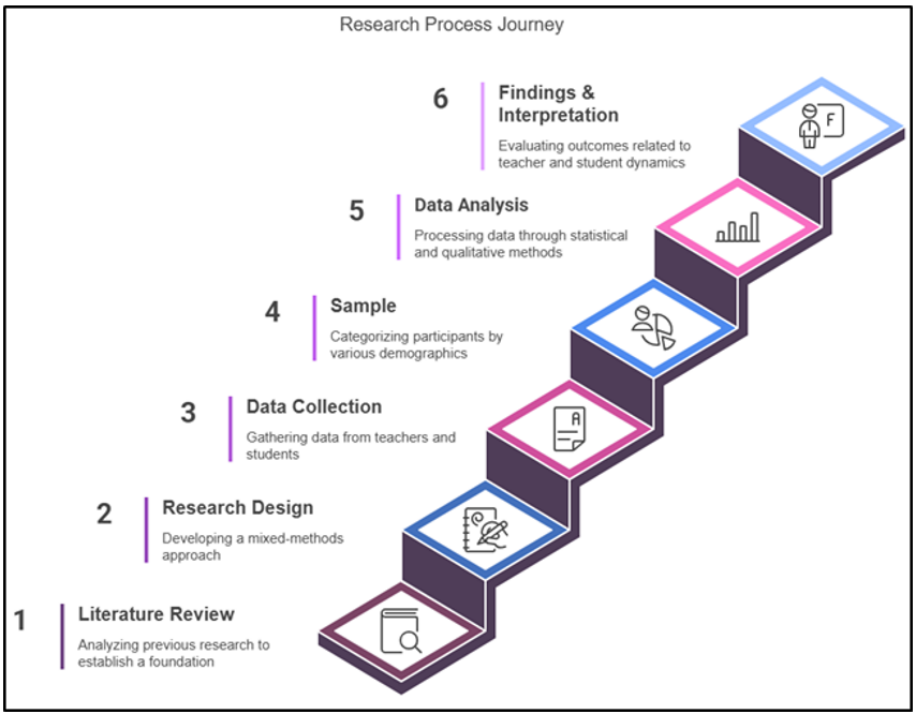

Figure 1.
Research methodology flowchart.

The experimental teaching of integrated geography and tourism education made use of digital tools and active learning methods.

Creation of thematic maps: The students developed maps with the help of Map Chart, Canva, and PowerPoint. To fill in the cartographic materials, texts from textbooks and statistical data from official websites stat.gov.kz, were used. This allowed students to independently analyze and visualize geographical information.

Writing an essay: As a creative task, students wrote an essay on “How to improve tourism in Almaty?”, “A tourist city through my eyes”. This contributed to the development of their critical thinking, analytical skills, and ability to express their own opinion about the tourist potential of the region.

Use of AR/VR technologies: Augmented and virtual reality technologies were used in the classroom to immerse students in the tourist environment. Students took 3D trips to museums, explored virtual tourist routes, and gained practical experience in working with innovative educational tools.

At the end of the lesson, students provided feedback. Most noted that the use of AR/VR technologies made the process of studying tourism more exciting and visual, and that digital tools such as maps and essays helped them to better understand the geographical aspects of tourism development.

Geography teachers of general education schools in the Republic of Kazakhstan, 9th-grade students of general education school №192 named after Rakhim Sarsenbin in the Nauryzbay district of the city of Almaty, and 9th-11th-grade students of school-gymnasium №81 in the Bostandyk district participated in the study. Geography teachers received a questionnaire with 10 questions. The teachers' questionnaires were distributed through republican chats of geography teachers. Usually, more than a hundred and sometimes more than a thousand teachers participate in such WhatsApp and Telegram chats. The questionnaire consisted of questions about geography in tourism education, the use of the four components of geographical culture (geographical picture of the world, geographical thinking, language of geography (map), and methods of geography research), and integrated education.

The study focuses on students in the 9th grade, as it is during this period that they study the geography of Kazakhstan. This subject plays a key role in the formation of students' geographical culture, as it allows them to better understand the natural, economic, and social features of their country. The study of geography at this age promotes the development of cartographic skills, spatial thinking, and awareness of the importance of natural resources.

In addition to Year 9 pupils, Year 10-11 secondary school pupils also took part in the study. Their inclusion is due to the need to observe the dynamics of the formation of geographical culture and to determine how deep and stable the knowledge acquired earlier is. The diversity of the classes also allows for a comparative analysis of the level of geographic literacy and the identification of key pedagogical factors contributing to its development.

Table 1.
Socio-demographic characteristics of students participating in the study.

No.	School	Class	Quantity	Gender		Age
				Male	Female	
1	Public school No. 192 by Rakhim Sarsenbin	9 «B»	28	12	16	15-16
		9 «G»	31	17	14	15-16
2	School-gymnasium No.81	9 «A»	22	12	10	15-16
		9 «B»	21	9	12	15-16
		10 «A»	25	11	14	16-17
		10 «B»	17	5	12	16-17
		11 «A»	28	14	14	17-18
General		7	172	80	92	15-18

As can be seen from Table 1, the total number of participants was 172, of which 80 were boys and 92 were girls. The students ranged in age from 15 to 18 years, covering both primary and secondary school. The largest number of respondents is represented by students of the 9th grade, which corresponds to the purpose of the study - to study the effectiveness of the formation of geographical culture in the period of active development of national geography.

The comparative analysis of the data from both schools allows for to identification of possible differences in the level of geographical knowledge and skills, as well as the impact of different pedagogical approaches on the learning process. In addition, the distribution of students by year group makes it possible to assess how the perception of geographical knowledge changes with age and to what extent the school curriculum contributes to the awareness of the role of geography in everyday life.

Understanding the composition of the teaching workforce is essential for assessing the quality of education and identifying areas for development. The following analysis examines teachers by age, gender, professional category, and geographical distribution. These factors provide valuable information about the current state of the teaching workforce (Figure 2).

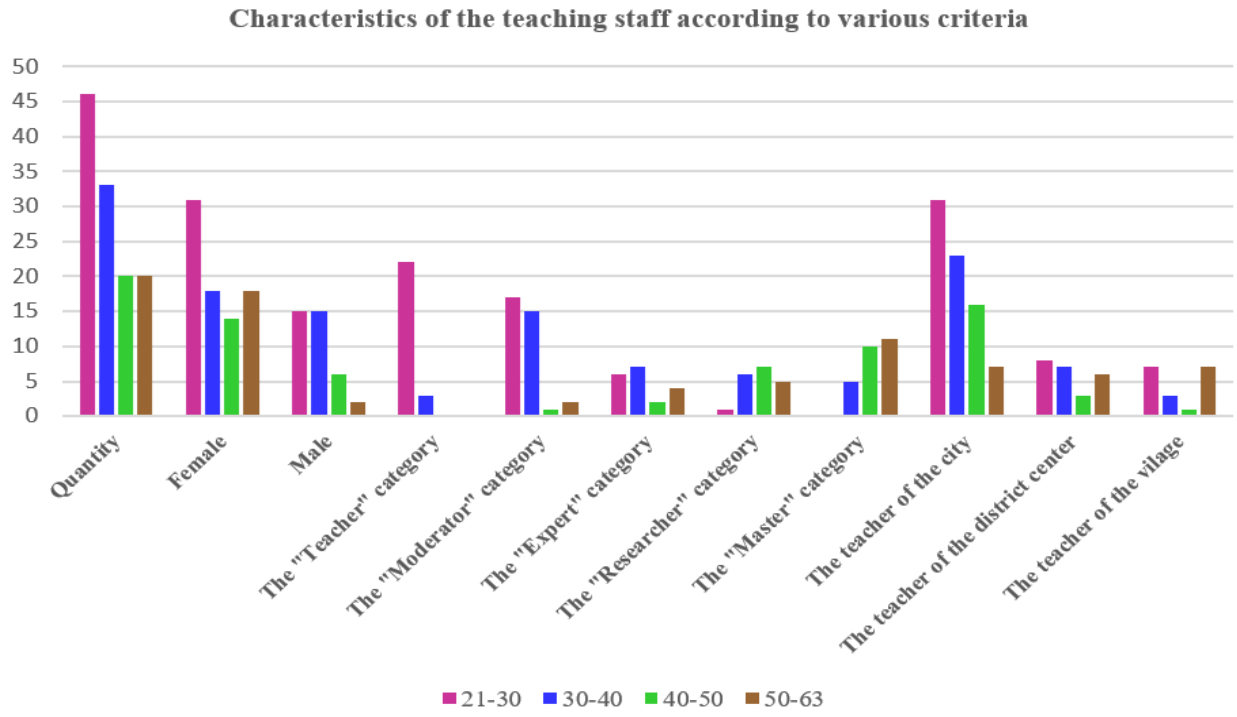

Figure 2.
Analysis of teaching staff characteristics by age, gender, qualification and location.

3.1. Age Distribution

As shown in Figure 2, teachers can be divided into four age categories: 21-30 years (38.9%), 31-40 years (27.8%), 41-50 years (16.7%), and 51-63 years (16.7%). The largest group is made up of young teachers aged 21-30, indicating an active influx of new professionals into the education system. The presence of older teachers ensures continuity and the transfer of experience within the profession.

3.2. Gender Composition

The teaching profession is predominantly female in all age groups. Among teachers in the 21-30 age group, there are 46 women and only 8 men, and in the 31-40 age group, there are 33 women and 5 men. This trend continues in the older age groups, underlining the traditionally strong representation of women in education.

3.3. Professional categories

Teachers are classified into different professional categories according to their qualifications and experience. As can be seen in Figure 2, the majority belong to the “Teacher” category (22 teachers in the age group 21-30 and 5 in the age group 31-40). This is followed by the “Moderator” category with 17 teachers in the 21-30 age group and 15 in the 31-40 age group. Fewer teachers reach higher ranks such as the “Expert” category, “Researcher” and “Master”, indicating the need for career development programmers. For example, in the “Master” category, there are only 10 teachers in the 41-50 age group and 11 in the 51-63 age group, suggesting that advanced qualifications are more common among experienced teachers.

3.4. Geographical Distribution

The graph in Figure 1 also shows the distribution of teachers by location. The majority work in urban areas, with 31 teachers aged 21-30 employed in urban schools and 23 teachers aged 31-40. There are fewer teachers in district centers, with 8 in the 21-30 age group and 7 in the 31-40 age group. Rural schools have even fewer teachers, with only 7 teachers in the 21-30 age group and 3 in the 31-40 category working in village schools. This highlights the challenge of attracting and retaining teachers in remote areas.

In summary, Figure 2 illustrates the age, gender, qualification, and geographical distribution of teachers. The data show a strong presence of young teachers, a significant dominance of female teachers, and an uneven distribution of teachers between urban and rural areas. Addressing the shortage of highly qualified teachers and improving working conditions in rural schools can contribute to a more balanced and efficient education system.

Qualitative and quantitative methods were used in the analysis of the students' essays and the results of the teacher and student questionnaires. The essays were evaluated on the basis of their structure, the depth of their content, the extent to which they used data, and their ability to think creatively. Teachers' and students' responses were presented in the form of graphs, and their views on tourism education were examined in relative terms. In addition, the following criteria were used to quantitatively evaluate the students' essays. These criteria allowed us to analyze the content of the essays in more depth and to assess their level of understanding regarding tourism.

3.5. Criteria for marking students' essays

1. Textual organization (20 points)
- The introduction, the main part of the essay, and the conclusion are clearly and logically linked.
- The question posed is clearly answered.

2. Argumentation (25 points)
- The student has been able to express his/her point of view in a reasoned way.
- Propositions and conclusions are logical.

3. Creativity (20 points)
- New, unique proposals for tourism development have been developed.
- There is an original idea and personal opinion.

4. Using maps and statistics (15 points)
- The essay makes use of official statistical data and cartographic material.

5. Linguistic competence and stylistics (20 points)
- Conveys ideas in a clear, comprehensible, and academic style.
- No grammatical or spelling mistakes.

The data obtained from these criteria will be discussed in detail in the forthcoming “Results and Discussion” section.

4. Results and Discussion

This section analyzes and explains the results of the study by comparing them with previous studies. The effectiveness of the methods used to develop geographical culture will be assessed from aspects such as school tourism education, inclusive education, virtual education, and improving pedagogical methods.

4.1. Practical implementation of interactive methods in geography education

In practice, these digital tools and interactive methods have been integrated into the geography curriculum to increase student engagement and geography culture. A key example is a lesson on "Natural Heritage of Kazakhstan" in grade 9. During this lesson, students actively participated in creating thematic and animated maps visualizing different natural and recreational sites throughout the country.

4.1.1. Development of thematic and animated maps.

To deepen students' understanding of Kazakhstan's natural heritage, they created interactive maps using platforms such as Map Chart, Canva, and PowerPoint. Unlike traditional cartographic exercises, these maps were enhanced with animations and visual markers representing key geographical features. For example:

- Lakes were depicted with floating symbols of swimmers or boats to indicate recreational potential.
- Mountain areas were marked with icons of hikers and climbers to highlight ecotourism opportunities.
- Steppe and desert areas were marked with images of wildlife to showcase biodiversity and conservation efforts.

This approach helped students not only to visualize but also to critically analyze how different geographical locations support specific types of tourism, from adventure tourism in the mountains to water-based activities in Kazakhstan's lakes.

4.1.2. Immersive learning using AR/VR technologies

AR and VR technologies were actively used to further immerse students in the study of Kazakhstan's cultural and natural heritage. Using apps such as Google Expeditions and Merge EDU, students made hands-on visits to famous museums, nature reserves, and UNESCO sites. Some of the key activities included:

- A 3D tour of the world's most famous museums, allowing students to compare international and local approaches to heritage conservation.
- A virtual exploration of Kazakhstan's national parks, where students observed the landscape, flora, and fauna in an interactive environment.
- Simulated hiking routes that allow students to plan virtual itineraries based on the geographical and cultural significance of different regions.

These experiences significantly enriched students' spatial thinking and helped them gain a deeper understanding of the relationship between geography and tourism. Student feedback indicated that AR/VR made geography lessons more engaging and motivated them to explore real-world applications of the subject outside the classroom.

4.1.3. Results and impact on learning

The integration of these methods showed a clear improvement in students' analytical and problem-solving skills, as well as their interest in geography. By combining digital tools with traditional teaching methods, students were able to:

- Develop critical thinking skills through independent research and creative tasks.
- Develop spatial awareness by creating detailed thematic maps
- Strengthen practical application skills by analyzing tourism opportunities in the real world.

These findings reinforce the importance of using interactive and interdisciplinary approaches to foster a geographical culture in students and prepare them for a deeper and more applied understanding of the subject.

4.2. The importance of tourism education in schools

The tourism sector plays a crucial role in the education system, especially in the teaching of geography in schools. According to the literature, the School of Tourism at the Jagiellonian University in Poland in the 1930s was a pioneering center that emphasized the importance of tourism education, including fieldwork and linking research topics to the teaching process [47]. This approach helped to raise public awareness of the importance of tourism for the socio-economic development of regions and cities. In addition, the COVID-19 pandemic has accelerated the shift towards innovative teaching methods such as the use of virtual reality, 3D images and videos, augmented reality, and gamification, highlighting the need to integrate these methods into tourism education [48]. These modern teaching methods can increase student motivation and engagement as they allow for more interactive and immersive learning of geography [49]. This approach not only benefits students but also provides tourism businesses with the opportunity to employ highly skilled personnel who contribute to the success of the industry. Overall, the integration of the tourism industry into the education system, particularly geography education, has the potential to increase student engagement, develop practical skills, and raise awareness of the importance of tourism to the socio-economic development of regions and cities.

The extent to which teachers use tourism-related teaching methods is depicted in Figure 3. The results of the study indicated that 60% of the teachers often use tourism elements in the classroom, 25% use them rarely, and 15% do not use them at all.

As can be seen from the results in Figure 3, the majority of teachers try to use active methods when teaching tourism, but this trend is not typical of all teachers. The subject competence of the geography teacher has a direct impact on the quality of the educational process. This is confirmed by a number of studies [50-54]:

- The professional competence of a geography teacher includes three levels: competence in the field of geographical culture, competence in the field of tourism and nature activities, and methodological competence.
- Geography teachers must have professional competence, which includes a thorough knowledge of the subject, relevant concepts;
- A high competence of a geography teacher allows them to level of subject effectively manage the educational process and to use various teaching methods and technologies, which in turn increases the quality of education. Thus, it can be concluded that the subject competence of a geography teacher is a key factor determining the quality of the educational process.

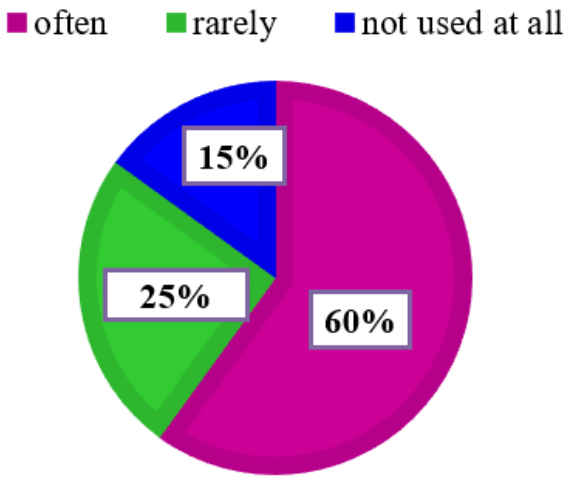

Figure 3.
Teachers' use of tourism teaching methods (%).

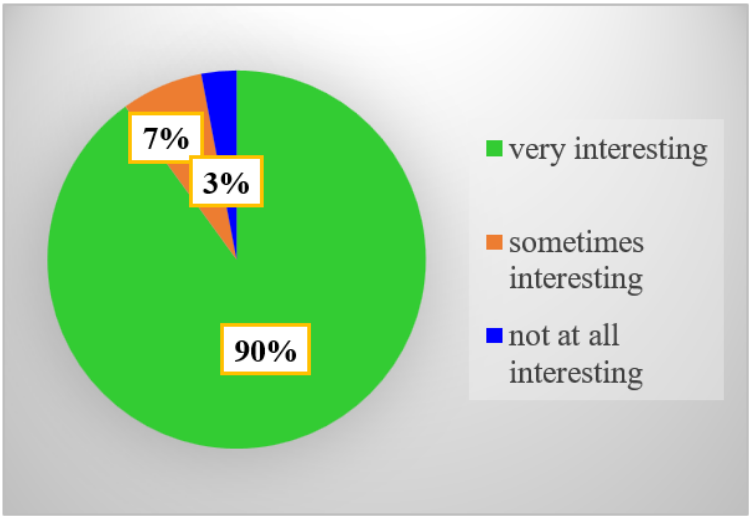

Figure 4.
Student interest in tourism (%).

Figure 4 shows the level of student interest in tourism topics in geography. According to the survey results, 90% rated tourism topics as very interesting, 7% as sometimes interesting, and 3% as not at all interesting.

Although the vast majority of students found tourism-related activities interesting, their interest could be further developed through hands-on activities and practical lessons, as shown in Figure 4. In their research, Makhashova and Buiembayeva [55] and Kurniawan et al. [56] proved that practical geography classes are much more interesting for students than traditional theoretical classes. The practical training in research allows students to apply the theoretical knowledge they have acquired in practice, thus increasing their motivation and interest in the subject. In addition, the use of can help students develop their creativity and deepen their understanding of geography. Practical teaching using modern technology and multimedia tools increases the effectiveness of training and promotes better assimilation of material compared to traditional methods. Practical geography teaching, which combines theoretical knowledge with practical application, significantly increases students' interest and participation in the learning process compared to traditional theoretical teaching.

4.3. Using the Petersen method, students' essays were analyzed and scored.

The essays were evaluated according to the above evaluation criteria, and a separate score is given for each criterion. The total score was calculated using the Petersen method. This method allows for a more accurate assessment of the students' essay writing skills as it takes into account the lowest, highest, and most frequent scores.

The total score according to the Petersen method was determined by the following formula:

$$\text{Overeal score} = (X_{min} + 2 \times X_{mode} + X_{max}) \div 4$$

where Xmin – minimum score; Xmode – most frequent score; Xmax – highest score

According to the results of the assessment: Xmin – minimum score: 6; Xmode – most frequent score: 8; Xmax – highest score: 10.

Total calculation according to the formula:

Overall score= (6 + 2 ×8 + 10) ÷ 4 = 8

This result shows that the average score of those students who had to write essays was 8 points. This is considered a good level, which means that most students already have sufficient essay writing skills.

Although the number of students with high scores (10 points) is small, it means that they have written a meaningful, logically well-structured essay.

The mode (8 points) shows that most students scored above average. This means that they have sufficient essay writing skills and a good understanding of the subject.

Although the number of students who scored low (6 points) is small, they need to be supported, and more work needs to be done to improve the structure and content of the essays.

The mean score (8) calculated using the Peterson method shows that students have a good level of essay writing. However, it is important to provide students with feedback and additional essay writing guidance to further improve their scores. This will help them to further develop their academic writing skills.

5. Conclusion

The aim of the research was to find out the effectiveness of integrated education, the use of tourism elements, and modern pedagogical methods in the formation of students' geographical culture.

The results of the study show that integrated learning has a positive impact on improving students' spatial thinking, mapping skills, and geographical knowledge. In particular, integration with computer science enabled students to effectively use modern tools such as Geographic Information Systems (GIS), digital mapping, and virtual tours.

Moreover, the use of tourism elements in geography education has been shown to increase students' interest in the subject and is an important tool for developing geographical culture. Tourism topics were rated as very interesting by 90% of students, which increases their desire to relate geographical knowledge to life.

The study also analyzed the professional composition of teachers and found that their age characteristics and professional categories have a direct impact on the quality of teaching. While the increase in the number of young professionals allows for the introduction of new methods and innovations into the education system, the continuity of experienced teachers helps to maintain the quality of education.

The students' essay writing skills were assessed on the basis of the Petersen method. The average score was 8, indicating a good level of knowledge in the subject. However, it was found that some students needed additional support to improve the structure and content of their essays.

General conclusions:

- Integrated learning helps to develop students' spatial thinking and digital skills, especially when combined with computer skills.
- Tourism elements increase students' motivation and help to develop a deeper geographical culture.
- Raising the professional level of teachers and supporting young professionals is an important factor in improving the quality of education.
- Petersen's evaluation showed that students' essay writing skills were moderately good, but some students needed additional support.

The results of this study highlight the importance of introducing effective methods of teaching geography and emphasize the need for widespread use of tourism technology and integrated learning in the educational process.

References

[1] M. A. C. Ramis, "Tourism education in Spain's secondary schools: The curriculums' perspective," *Journal of Hospitality, Leisure, Sport & Tourism Education,* vol. 29, p. 100292, 2021. https://doi.org/10.1016/j.jhlste.2020.100292

[2] B. Kırlar-Can, M. Ertaş, and M. Kozak, "Understanding the philosophy of tourism education: A perspective study in Turkey," *International Journal of Tourism Research,* vol. 23, no. 6, pp. 1112-1125, 2021. https://doi.org/10.1002/jtr.2472

[3] R. M. AlAli and A. A. Al-Barakat, "Leveraging geography teachers' pedagogical skills to enhance secondary students' understanding of tourism concepts," *Geojournal of Tourism and Geosites,* vol. 57, no. 4spl, pp. 1885–1892, 2024. https://doi.org/10.30892/gtg.574spl02-1355

[4] R. Fox, "Global education challenge: Trends and idea," *Tourism and Hospitality Management, University of Rijeka, Faculty of Tourism and Hospitality Management,* 2003. http://doi.org/10.20867/thm.9.1.4

[5] Y. C. Chang, *Analyzing the moderating effect of knowledge innovation of tourism and hospitality department teachers on student creative self-efficacy and innovation behaviors by using hierarchical linear modeling. (M. Cheng, Ed.), Cogent Education*. Informa UK Limited. http://doi.org/10.1080/2331186x.2018.1535755, 2018.

[6] F. Ferrari, "Skill mismatch e profili professionali: Il settore turistico-alberghiero," Retrieved: https://mpra.ub.unimuenchen.de/id/eprint/22363, 2010.

[7] V. P. Maksakovsky, *Geographical culture*. Moscow: Vlados, 1998.

[8] E. K. Zueva, "Geographical culture," *Problems of Modern Teacher Education,* vol. 52, no. 2, pp. 95-101, 2016.

[9] O. S. Mikhailovsky, "Modern problems of education and geographical culture of personality," *Man and Education,* vol. 4-5, pp. 79-83, 2006.

[10] V. P. Dronov, D. L. Lopatnikov, E. A. Customs, and M. E. Emirova, "The course "The surrounding world" as a pro-paedeutic basis for the formation of a student's geographical culture," *Problems of Modern Education,* vol. 1, pp. 95-111, 2018.

[11] A. Abylkassymova, Y. Yessetov, Y. Tuyakov, and A. Ardabayeva, "Teaching geometry in school: Digital resources to develop students' spatial thinking," *International Journal of Innovative Research and Scientific Studies,* vol. 8, no. 1, pp. 439–450, 2025. https://doi.org/10.53894/ijirss.v8i1.4175

[12] B. Kurbanbekov, M. Nurizinova, S. Ramankulov, Y. Yergobek, and M. Akeshova, "STEM-integrated education: Assessment of the liquidity of training future specialists in the engineering and technical fields," *International Journal of Innovative Research and Scientific Studies*, vol. 8, no. 1, pp. 1077–1086, 2025. https://doi.org/10.53894/ijirss.v8i1.4532

[13] V. L. Pogodina, "Educational tourism as a means of developing the geographical culture of students," in *Proceedings of the Russian State Pedagogical University named after AI Herzen*, 2009, no. 116.

[14] A. N. Levitskaya, "Elements of integration education using a regional component based on the example of geography lessons in secondary schools," *Problems of Pedagogy*, vol. 1, no. 12, pp. 15-18, 2016.

[15] I. Y. Strekopytova, *Using the principle of integrativity when considering tourism issues in geography lessons at school. In Modern studies of natural and socio-economic systems. Innovative processes and problems of the development of natural science education*. Berlin: Springer, 2014.

[16] A. Budiman, A. Hufad, and P. Purnomo, *Development of campus potential-based integration education tourism model. Advances in Social Science, Education and Humanities Research*. Atlantis Press. https://doi.org/10.2991/assehr.k.220601.006, 2022.

[17] O. Amangeldi, G. Aubakirova, K. Duisebayeva, U. Esnazarova, and T. Kurt, "Pedagogical methods of tourism education in general education schools in Kazakhstan," *GeoJournal of Tourism and Geosites*, vol. 51, no. 4spl, pp. 1629–1635, 2023. https://doi.org/10.30892/gtg.514spl04-1159

[18] Y. Issakov *et al.*, "Study of the effectiveness of tourism and local lore activities of geography teachers in Kazakhstan," *GeoJournal of Tourism and Geosites*, vol. 48, no. 2spl, pp. 741–750, 2023. https://doi.org/10.30892/gtg.482spl08-1074

[19] M. P. Bishop, J. F. Shroder, and T. K. Moore, "Integration of computer technology and interactive learning in geographic education," *Journal of Geography in Higher Education*, vol. 19, no. 1, pp. 97–110, 1995. https://doi.org/10.1080/03098269508709292

[20] M. S. Y. Jong, C. C. Tsai, H. Xie, and F. Kwan-Kit Wong, "Integrating interactive learner-immersed video-based virtual reality into learning and teaching of physical geography," *British Journal of Educational Technology*, vol. 51, no. 6, pp. 2064–2079, 2020.

[21] J. Li and D. Zhang, "The application of the multimedia technology in teaching introduction to tourism," presented at the 2010 International Conference on Machine Vision and Human-Machine Interface. IEEE. http://doi.org/10.1109/mvhi.2010.109, 2010.

[22] K. Cheng, "Research on the development and construction of virtual reality teaching resources based on artificial intelligence," Proceedings of the 2nd International Conference on Internet Technology and Educational Informatization, ITEI 2022, December 23-25, 2022, Harbin, China. EAI. http://doi.org/10.4108/eai.23-12-2022.2329120., 2023.

[23] L. Solcova and M. Magdin, *The implementation and use of ICT for support for teaching students - specifically geography. eLearning and Software for Education*. Carol I National Defence University Publishing House. http://doi.org/10.12753/2066-026x-13-201, 2013.

[24] J. F. Franco, S. R. Da Cruz, and R. De Deus Lopes, *Computer graphics, interactive technologies and collaborative learning synergy supporting individuals' skills development. ACM SIGGRAPH 2006 Educators Program on - SIGGRAPH '06*. ACM Press. http://doi.org/10.1145/1179295.1179338, 2006.

[25] R. Ridwana and S. Himayah, "Utilization of remote sensing technology and geographic information systems for tourism development," *International Journal of Applied Sciences in Tourism and Events*, vol. 4, no. 2, pp. 158–169, 2020. https://doi.org/10.31940/ijaste.v4i2.2042

[26] G. R. Tursinbaevna, T. Z. Muzapparovna, and K. M. Turganbaevna, "The implementation of innovative technologies in teaching geography," *International Journal of Pedagogics*, vol. 3, no. 10, pp. 53–56, 2023. https://doi.org/10.37547/ijp/volume03issue10-10

[27] M. Shafiee Roodposhti and F. Esmaeelbeigi, *Viewpoints on AR and VR in heritage tourism. Digital Applications in Archaeology and Cultural Heritage*. Elsevier BV. http://doi.org/10.1016/j.daach.2024.e00333, 2024.

[28] D. Sinton, *GIS, geospatial technology, and spatial thinking in geography education. Geography*. Oxford University Press. http://doi.org/10.1093/obo/9780199874002-0276, 2023.

[29] K. Yano, S. Imamura, D. Kawahara, Y. Shimomura, and O. Furukawa, *Developing and evaluating Virtual Heiankyō AR. Advances in Geographical and Environmental Sciences*. Springer Nature Singapore. http://doi.org/10.1007/978-981-19-1536-9_3, 2022.

[30] O. V. Bondarenko, O. V. Hanchuk, O. V. Pakhomova, and I. M. Varfolomyeyeva, "Digitalization of geographic higher education: Problems and prospects," presented at the Journal of Physics: Conference Series. IOP Publishing. http://doi.org/10.1088/1742-6596/2611/1/012015, 2023.

[31] T. Oguchi, H. Yamauchi, J. Song, T. Ogura, and K. Iizuka, *Developing methodologies and materials for GIS education to university and high school students*. Copernicus GmbH. http://doi.org/10.5194/egusphere-egu23-4945, 2023.

[32] A. F. Bortnik and N. R. Bortnik, "Intersubject integration in technology lessons," *Problems of Modern Pedagogical Education*, vol. 65-2, pp. 60–62, 2019.

[33] Y. Issakov *et al.*, "Digital transformation reshaping tourism education: Investigating the influence of MOOCs on teaching tourism fundamentals and local lore," *GeoJournal of Tourism and Geosites*, vol. 49, no. 3, pp. 1015–1026, 2023. https://doi.org/10.30892/gtg.49317-1101

[34] O. Korol, "Work with elementary GIS in the process of the informatic training of future geography bachelors," *Physical and Mathematical Education*, vol. 25, no. 3, pp. 81-87, 2020. https://doi.org/10.31110/2413-1571-2020-025-3-030

[35] A. Ivkov-Dzigurski, L. Ivanovic, and M. Pasic, "Possibilities of computer application in modern geography teaching process," *Glasnik Srpskog Geografskog Drustva*, vol. 89, no. 1, pp. 139–151, 2009. https://doi.org/10.2298/gsgd0901139i

[36] K. Muzdybayeva and L. D. Dávid, "Structural model of formation of geoecological competence of tourism students," *Journal of Geography in Higher Education*, pp. 1-25, 2024. https://doi.org/10.1080/03098265.2023.229832

[37] S. Ayzhan, K. Kulyash, M. Kulash, M. Zabira, I. Yerlan, and U. Nurbol, "Teaching and Learning foundation of the elective course "Cultural Geography"," *World Journal on Educational Technology: Current Issues*, vol. 13, no. 4, pp. 1040–1050, 2021. https://doi.org/10.18844/wjet.v13i4.6297

[38] A. B. Santoso *et al.*, "The utilization of Technology-Based WebGis as an effort to establish the spatial thinking ability of geographic students in high school," *Advances in Social Science, Education and Humanities Research, Advances in Social Science, Education and Humanities Research*, 2021. https://doi.org/10.2991/assehr.k.210918.005

[39] O. Bayteryakov and T. Sobetskaya, "General approaches to the cartographic culture formation in the physical-geographic courses of school geography," *Scientific Bulletin Melitopol State Pedagogical*, vol. 1, no. 28, pp. 100–106, 2023. https://doi.org/10.33842/22195203-2022-28-100-106

[40] A. A. Yurieva and Y. A. Olishevska, "Organization of geography week for institutions of general secondary education as a form of realizing the teacher's creative potential," *Constructive Geography and Rational Use of Natural Resources*, vol. 2, no. 2, pp. 39–42, 2022. https://doi.org/10.17721/2786-4561.2022.2.2-7/13

[41] R. M. AlAli and A. A. Al-Barakat, "Assessing the role of social studies curricula in enhancing tourism awareness among high school students: A student perspective," *International Journal of Learning, Teaching and Educational Research*, vol. 23, no. 10, pp. 318-338, 2024.

[42] A. Petrovets, D. His, and O. Gryniuk, "Tourist and local history hikes as a form of extracurricular work," *Constructive Geography and Rational Use of Natural Resources*, vol. 3, no. 2, pp. 27–33, 2023b. https://doi.org/10.17721/2786-4561.2023.3.2-4/13

[43] C. Arcodia, M. A. Novais, N. Cavlek, and A. Humpe, "Educational tourism and experiential learning: students' perceptions of field trips," *Tourism Review*, vol. 76, no. 1, pp. 241–254, 2020. https://doi.org/10.1108/tr-05-2019-0155

[44] C. P. García Trasmonte, P. E. Lujan-Vera, L.-V. Patiño-García, M. M. Mogollón Taboada, J. Mamani Cornejo, and L. A. Cruz García, *School tourism management in Peru: A comparative study in San Pedro Chanel and Carlos Augusto Salaverry. Human Review. International Humanities Review / Revista Internacional de Humanidades*. Eurasia Academic Publishing Group. http://doi.org/10.37467/revhuman.v21.5040, 2023.

[45] A. Nurgazina, A. Ravshanov, M. Usmanov, L. Ibragimov, and A. Sergeyeva, "Artificial intelligence in geographical education of Kazakhstan and Uzbekistan: Revolution of knowledge and approaches," *International Journal of Innovative Research and Scientific Studies*, vol. 8, no. 2, pp. 1797–1811, 2025. https://doi.org/10.53894/ijirss.v8i2.5546

[46] T. 24kz, "15.3 million tourists visited Kazakhstan in 2024," Retrieved: https://24.kz/ru/news/social/697570-15-3-mln-turistov-posetili-kazakhstan-v-2024-godu, 2025.

[47] A. Jackowski, I. Sołjan, E. Bilska-Wodecka, and J. Liro, "Geographical tourism research and education at the Jagiellonian University school of tourism in Poland (1936–1939)," *History of Geo-and Space Sciences*, vol. 7, no. 2, pp. 91-101, 2016. http://doi.org/10.5194/hgss-7-91-2016

[48] H. Sandhya and B. Varghese, *The emerging role of innovative teaching practices in tourism education in the post-COVID-19 Era. In Innovative Digital Practices and Globalization in Higher Education*. IGI Global. https://doi.org/10.4018/978-1-6684-6339-0.ch016, 2023.

[49] G. Dinis, C. Melo, and J. Sousa, *Teaching and learning in tourism: The case of tourism laboratory. In Perspectives and Trends in Education and Technology: Selected Papers from ICITED 2021*. Singapore: Springer Singapore, 2021.

[50] J. Laub, D. Felzmann, and M. Horn, "Subject-related ethical professional knowledge of geography teachers as a prerequisite for promoting ethical judgment in geography lessons," *Journal of Geography Didactics (ZGD)*, vol. 49, no. 1, pp. 1-13, 2021.

[51] W. S. Wright and C. M. Smith, "Notes: The qualifications of geography teachers," *New Zealand Journal of Geography*, vol. 58, no. 1, pp. 27–28, 1975. https://doi.org/10.1111/j.0028-8292.1975.tb00742.x

[52] I. Djuanda, "Improving teacher competence as professional educators in developing learning," *Alim - Journal of Islamic Education, Kopertais Region - DKI Jakarta and Banten*, 2019. https://doi.org/10.51275/alim.v1i2.145

[53] I. Farida, S. Tippe, and B. Tunas, *The effect of competence and motivation on teacher performance in development technology vocational school Bekasi West Java*. AI-BPM Publisher. http://doi.org/10.32535/apjme.v3i1.739, 2020.

[54] C. Wijaya, L. R. Ginting, J. Iswanto, M. Nadia, and A. A. Rahman, *Improving the quality of education by developing the social competency of teachers*. STAI Hubbulwathan Duri. http://doi.org/10.35445/alishlah.v15i3.1564, 2023.

[55] P. Makhashova and S. Buiembayeva, "Features of practical classes on the formation of students' creativity," *Dulaty University Bulletin*, vol. 1, no. 13, pp. 47–53, 2024. https://doi.org/10.55956/xxqx5157

[56] E. Kurniawan, B. Eva, M. Dafip, and S. S, "A teaching-based technology in geography learning," *Cypriot Journal of Educational Sciences*, vol. 15, no. 4, pp. 766–776, 2020. https://doi.org/10.18844/cjes.v15i4.5058