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COMPARATIVE STUDY OF GEOECOLOGY EDUCATION IN MIDDLE SCHOOLS IN KAZAKHSTAN AND KYRGYZSTAN - COMPARATIVE MODEL

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Abstract

This comparative study examines the curricular structure, teaching methods, opinions of teachers, resources allotted, and student involvement in the middle school education system with regard to the study of geoecology in Kyrgyzstan and Kazakhstan. The geoecology study incorporates aspects of both ecology and geology and is hence an important part of students' upgraded knowledge on environmental issues, particularly about areas that feature problems of resource depletion, ecosystem deterioration, and climatic change. In Kyrgyzstan, interactive, student-centered methods of teaching are preferred to Kazakhstan's highly organized lecture-based approach with supplementary activities. The results show that teachers in Kazakhstan report being more confident about their abilities to foster environmental awareness and critical thinking and spend much more instructional time on the geoecology topics. Both countries have significant common challenges such as curricular limitations, scarce resources for teaching, and the need for teacher trainings among many other factors. The comparative model of this study shall aim at equipping students with competencies for dealing with environmental problems on both local and international levels, while bringing into focus the pros and cons of geoecology education in the country under study and recommendations on enhancing teaching methodologies.

Keywords:*Comparative Study, Geoecology Education, Middle Schools, Kazakhstan, Kyrgyzstan.*

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1. INTRODUCTION

Geoecology, the multidisciplinary field of ecology and geology concepts, is important in teaching young people about the complex relationships that exist between the biological systems and the physical environment of Earth. Geoecology education is highly needed by global environmental problems such as resource depletion, loss of biodiversity, and climate change. Thus, middle school education is very important to instill the geoecology in children, since this stage is a base for the formation of environmental awareness. Kazakhstan and Kyrgyzstan are neighbors in Central Asia and share a common history and culture; therefore, similar environmental problems exist in these two countries.

Large lands of mountains and deserts are observable in both countries, and exploitation of resources, cutting down of forests, and climate change are putting increasing stress on the ecosystems of both these countries. It is time, therefore, that geoecological problems be taught to new generations. Although there are similarities in view, differences between the two systems of education regarding the teaching of geoecology arise also from differences of resources, policy, and strategy existing between Kazakhstan and Kyrgyzstan. The objective of this paper is to explore and compare the state of geoecology education in Kyrgyz and Kazakh middle schools. The main components of the study would include the framework and content of the geoecology curriculum, teacher qualifications, pedagogical approaches, availability of resources, and student participation in both countries.

This research will examine these factors in tracing the advantages, disadvantages, and possible areas for improvement of the geoecology education field. This study aims to provide a comparison model to guide further educational reforms in both countries for a more inclusive and interesting way to teach geoecology. Coming from unique education environments both in Kyrgyzstan and Kazakhstan, a comparison model issued from this study will consider examining the curricula of geoecology, teacher preparation programs, classroom procedures, and student outcomes both from the countries. The study aims to provide recommendations that may enhance effectiveness of geoecology instruction by identifying common challenges and best practices both in countries,

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thereby enhancing the readiness of students to understand and address environmental issues in their region and the world at large.

2. LITERATURE REVIEW

Lassche, M. R., &Molendijk, M. A. (2011)pledged to provide a curriculum vitae. The initial task, "Review undergraduate programs, industry demand, and faculty potential," required the administration of three surveys: Things to think about are potential GEM teachers, the sector's need, and the present regional course options. The job package consists of two parts: a. Design Survey—The course material is derived from an analysis of pertinent data that considers various viewpoints, including academic ones, industry demands, job prospects, links to various application domains, and so on. At its inception, the program's assessment of course requirements was based on online questionnaires and interviews; it was service-based. This evaluation will take the following into account: • A survey and needs assessment of academic and scientific personnel at Central Asian partner universities for a revised GEM curriculum. • Undergraduates will be assessed using interviews, skill tests, and questionnaires to gauge their knowledge and abilities. Representatives from the industry were questioned by the employment demand sector. b. Look at what other partner universities in Central Asia and outside are teaching in order to make sure that GEM resources, courses, and professional qualifications are always improving and growing.

Dosmambetov, T. (2018)described the steps that the international community and the Kyrgyz government took following the country's independence from the Soviet Union in 1991 to mitigate the risks associated with radioactive sources and uranium residual sites. Kyrgyzstan and other Central Asian governments faced multiple challenges after achieving independence from the Soviet Union in 1991. Among these challenges were security and environmental issues stemming from the disarmament of the Soviet Union's nuclear weapons. The category also includes garbage from residential areas, abandoned uranium mines, and unprotected uranium tailings. A potential environmental disaster caused by these tailings might have far-reaching consequences for the region's economy, ecology, and human health, especially in transboundary areas. Various governmental agencies and professional groups offer guidance on these well-known threats. In

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addition to illuminating potential security threats, the case studies may provide useful insight for other nations dealing with comparable problems.

Havenith, et al. (2017)gave a synopsis of the ways in which natural catastrophes have affected the economy, ecology, and society of Kyrgyzstan during the latter part of the nineteenth century. Also featured will be natural disasters that have the potential to impact the entire nation. Because of the persistent occurrence of many geological dangers, this little Central Asian nation's environmental condition is worse than that of Western Europe. Landslides can be extremely destructive nearly every year, and earthquakes with magnitudes ranging from M>7 to M>6.3 happen every ten to twenty-five years. Following a string of disastrous earthquakes, the capital of Kyrgyzstan, Bishkek, was rechristened. Viewing Kyrgyzstan through the perspective of Central Asia is the most fruitful approach because to the similarities in the governmental impacts of bordering countries. Gave a synopsis of the ways in which natural catastrophes have affected the economy, ecology, and society of Kyrgyzstan during the latter part of the nineteenth century. Also featured will be natural disasters that have the potential to impact the entire nation. Because of the persistent occurrence of many geological dangers, this little Central Asian nation's environmental condition is worse than that of Western Europe. Landslides can be extremely destructive nearly every year, and earthquakes with magnitudes ranging from M>7 to M>6.3 happen every ten to twenty-five years. Following a string of disastrous earthquakes, the capital of Kyrgyzstan, Bishkek, was rechristened. Viewing Kyrgyzstan through the perspective of Central Asia is the most fruitful approach because to the similarities in the governmental impacts of bordering countries.

Есенгалиева, Т. (2022)focused on considering the issues with the evolution of geo and geoecology curricula in high schools. Some of the issues plaguing contemporary classrooms are discussed. Basic geoecological knowledge ought to be accessible to all individuals so that the environmental damage caused by humans can be magnified. Being able to anticipate one's surroundings and live intelligently is crucial. A thorough comprehension of natural resource diversity, preservation, prudent use, and reproduction can be attained by the systematic and

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planned accumulation of information. Geo-economics, geoecology, ecology, and geography students are the target readers of this piece. In order to solve global ecological, social, political, and economic issues, it is essential to gather this knowledge. Academic and extracurricular research supports environmental and geographical heritage preservation, high school geoecological and environmental science curricula, and future generations' access to quality education.

Georgousis, et al. (2021)examined the process by which geocultural awareness is maturing among youth. For religious, cultural, and aesthetic reasons, as well as because it has been suggested as a geological heritage site, students are familiar with Meteora Geomorphes. Geology and geography majors from Central Greek junior high school (Gymnasium) third-years and students from the cultural heritage departments at the University of Thessaly made up the study's sample population. We utilized a standardized questionnaire to collect this data, which asks participants about their knowledge, beliefs, attitudes, and values in relation to geocultural heritage. The findings demonstrate that the general public has limited understanding of environmental stewardship, conservation ethics, and the relationship between cultural heritage and geological past. It is obvious that geoeducational strategy design is necessary for geoenvironmental education, which is the integration of geoheritage into environmental education.

3. RESEARCH METHODOLOGY

3.1. Research Design

This comparative cross-section research design would be appropriate for this study because it would aim to explore the current status of geoecology education practices in Kazakhstan and Kyrgyzstan. It seeks to analyze and compare the content of the curriculum, teaching methods, teachers' opinions on their effectiveness, and challenges in middle school systems in Kazakhstan and Kyrgyzstan. A comparative approach to the design will help understand the similarities and differences of geoecology education within a specified period, providing an overall outlook of current practice across both countries.

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3.2. Research Area

The Region of Research refers to Kazakhstan and Kyrgyzstan. Specifically, it focuses on middle school education, grades 6-9. This would be the educational level that approaches geoecology topics as set forth in national curricula. The research focuses on subjects related to geoecology as presented through these curricula, hence giving insight into how environmental themes are approached in each country's standards.

3.3. Data Collection

Data Collection targets 120 middle school teachers of both the countries where geoecology is taught. It will use stratified sampling so that the sample taken as representative of the range and spread of regions and demography in Kazakhstan and Kyrgyzstan. Instruments used in data collection are structured questionnaires, as well as semi-structured interviews. The questionnaire consists of questions on curriculum content, teaching methods, teachers' perceptions regarding the effectiveness of geoecology education, and challenges that they face. In addition, a set of semi-structured interviews with selected teachers will be used to collect qualitative insights that supplement those collected through quantitative means using the questionnaires.

3.4. Data Analysis Techniques

Data Analysis Techniques is comprised of both quantitative and qualitative approaches. The quantitative data obtained from the questionnaire will be summarized using descriptive statistics based on frequency, percentages, and mean values. Chi-square tests will be run to determine whether there are any statistically significant differences between these two countries for the comparative analysis. Thematic analysis will be applied to the qualitative data from the open-ended questionnaire responses and interview transcripts. This would include coding of data to spot recurring themes through a coding framework tailored specially for this study. This framework would facilitate further organizing and systematizing the comparison between qualitative findings for both regions.

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4. DATA ANALYSIS

At different levels of education and with variable time allocations, such geoecology themes have become part of the national curriculum for Kyrgyzstan and Kazakhstan. These include students at grades 7 to 9 in Kazakhstan studying geoecology with special attention to biodiversity, degradation of the environment, and climate changes.

Table 1: The National Curriculum of Kyrgyzstan and Kazakhstan Incorporates Geoecology

Country	Geoecology Topics Covered	Grade Level	Time Allocation (Hours/Year)
Kazakhstan	Climate change, environmental degradation, biodiversity	7-9	50
Kyrgyzstan	Ecosystem conservation, natural resources, pollution	6-8	40

Fifty hours annually are dedicated to these disciplines in this curriculum, thus showing strong commitment to the cause of conservation and awareness of environmental issues. This is very evident in Kyrgyzstan, where forty hours annually are utilized for instruction in grades 6–8 on geoecology, relating to pollution, natural resources, and conservation of ecosystems. It entails a regional ecological theme and emphasis on the sustainable use of resources, which was integrated much earlier than in Kazakhstan but as a whole spent less teaching time, as shown in Table 1. On the whole, both countries aim at enhancing student's knowledge and understanding about the environment, though on different thematic foci, entry levels, and teaching hours.

Table 2: Methods of Instruction in Geoecology Education

Country	Common Teaching Methods	Percentage of Teachers Using Method

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Kazakhstan	Lecture-based, field trips, multimedia presentations	70%
Kyrgyzstan	Group discussions, case studies, interactive learning	65%

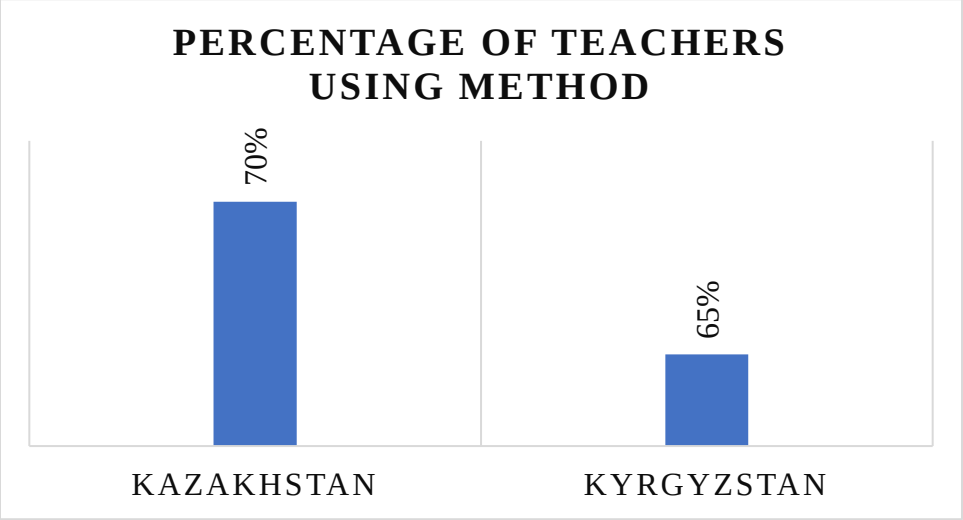

Figure 1: Methods of Instruction in Geoecology Education

Table 2 presents the most widely used teaching approaches in geoecology education in Kyrgyzstan and Kazakhstan and refers to regional differences in the educational approach. Kazakhstani educators mainly apply lectures, with field excursions and multimedia presentations as add-ons; this approach bespeaks a teacher-centered, systematic approach to teaching that supplement the absorption process by more than just experiential and visual activities. However, 65% of teachers in Kyrgyzstan are likely to be more participative by applying more interactive styles of teaching such as case studies, group discussions and other types of learning activities. This way the students explore geoecological problems in collaboration and with analytical thinking by focusing on interaction among students and applying critical thinking. In general terms, though both the countries apply many kinds of teaching, Kyrgyzstan emphasizes a very interactive, student-centered style of teaching while Kazakhstan is more likely to follow an orthodox lecture-based method.

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Table 3: Teachers' Views on the Effectiveness of Geoecology Education

Country	Promotes Environmental Awareness	Improves Critical Thinking	Student Engagement
Kazakhstan	85%	72%	78%
Kyrgyzstan	80%	68%	70%

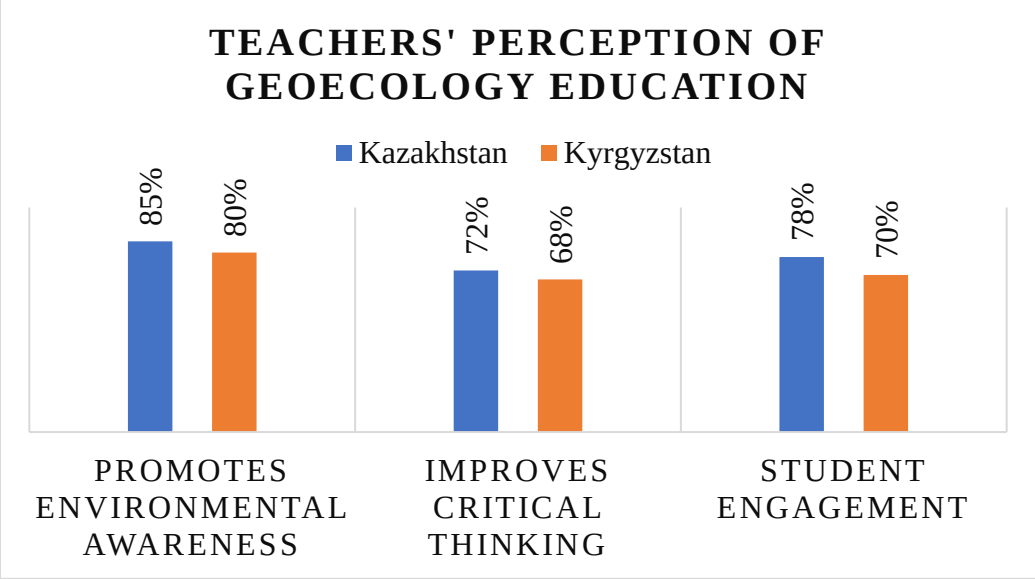

Figure 2: Teachers' Views on the Effectiveness of Geoecology Education

Table 3 Indicators of instructors' perceptions of effectiveness in teaching geoecology in Kazakhstan and Kyrgyzstan: critical thinking, involvement, and environmental consciousness In Kazakhstan, more respondents (85%) agreed that teaching students geoecology makes them more conscious of the environment. Furthermore, 78% are of the opinion that it effectively engages pupils, while 72% are of the opinion that it enhances critical thinking. Sixty-eight percent of Kyrgyzstan teachers report that geoecology education makes students think more critically,

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seventy percent report that it is interesting to students, and eighty percent report that it increases environmental awareness. The effects of geoecology education are generally regarded more positively in Kazakhstan than in Kyrgyzstan, even though opinions are positive in both countries. This is suggested by somewhat higher levels of teacher confidence in each dimension. However, the findings showed that teachers in both countries regarded geoecology teaching as a useful tool for inspiring critical thinking and awareness about the environment with a respectable level of student participation.

Table 4 shows key problems faced by teachers in teaching geoecology in Kazakhstan and Kyrgyzstan, based on issues related to curricular constraints, available resources, motivation of pupils, and preparation of teachers. Curriculum restrictions are cited as the biggest challenge both in Kazakhstan and Kyrgyzstan by 55% of teachers in Kazakhstan and 65% in Kyrgyzstan. This means that demanding curricula may hinder the delivery of geoecology instruction.

Table 4: Challenges in Teaching Geoecology

Country	Curriculum Constraints	Lack of Resources	Student Interest	Teacher Training
Kazakhstan	55%	40%	25%	30%
Kyrgyzstan	65%	45%	30%	35%

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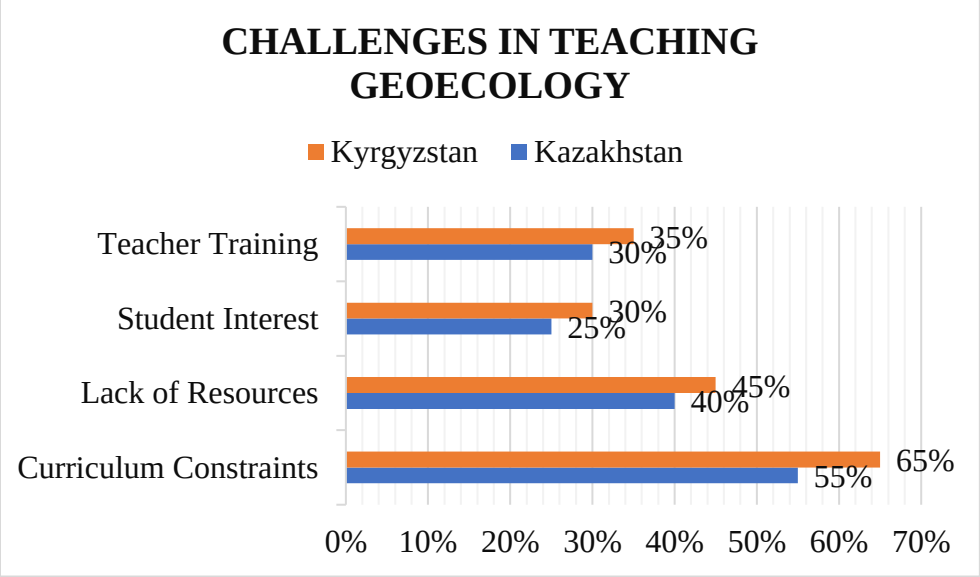

Figure 3: Challenges in Teaching Geoecology

Another concerned area is resource scarcity. 40% of trainers in Kazakhstan and a somewhat high 45% in Kyrgyzstan responded in the affirmative, meaning that the two countries must improve access to resources and teaching materials. For a moderate problem, 25% of teachers in Kazakhstan and 30% in Kyrgyzstan attributed this to student interest. This suggests that although it restricts some students, it is less common than curricular restrictions. Thirty percent of Kazakhstani teachers and thirty-five percent of Kyrgyz teachers reported they felt that teacher training was a concern, indicating that both countries may require additional professional development opportunities to strengthen the ability of their teaching staff to deliver geoecology. Normally, the chart seems to suggest that even though these two countries are facing similar problems, Kyrgyzstan is suffering more than Kazakhstan does, especially in regard to limiting studying and expectations set for teacher training.

5. CONCLUSION

This comparison of geoecology instruction in Kyrgyzstan and Kazakhstan shows striking similarities and differences in the way middle school curriculum deals with the environmental problems of the world. While Kyrgyzstan focuses on conservation of ecosystems and wise

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management of resources, it is initiated at an earlier stage of middle school through various kinds of interactive learning, while in Kazakhstan, topics such as climate change and biodiversity gain more importance where they are taught through structured lecture-based methods involving significant time allocation. While Kazakhstan's somewhat greater confidence levels indicate differences in teacher perceptions, instruction in geoecology appears to develop the same environmental consciousness, critical thinking, and student interaction in both countries. Common problems continue to be those relating to the curriculum and resources, which Kyrgyzstan presently experiences slightly more severely. These results have highlighted how flexible curricula, better resources, and a greater degree of preparation by teachers are crucially important in fostering more effective geoecology instruction in both countries. Addressing these issues can help both countries improve their education systems so that the future generation acquires ample skills to address ecological challenges facing the entire world.

REFERENCES

1. *Bedanokov, M. K., Kuizheva, S. K., Lebedev, S. A., &Kostianoy, A. G. (2020). From Regional Studies to International Collaboration. The Republic of Adygea Environment, 703-714.*
2. *DOSMAMBETOV, T. (2018). Political challenges of Global Environmental Security: uranium legacy in Kyrgyzstan, obstacles, perspectives and regulatory infrastructure (Doctoral dissertation, 서울대학교대학원).*
3. *Есенгалиева, Т. (2022). GEOECOLOGICAL EDUCATION IN SECONDARY SCHOOL FEATURES OF THE DEVELOPMENT OF ENLIGHTENMENT. Вестник ЗКУ, 88(4), 145-145.*
4. *Georgousis, E., Savelides, S., Mosios, S., Holokolos, M. V., &Drinia, H. (2021). The need for geoethical awareness: The importance of geoenvironmental education in geoheritage understanding in the case of Meteorageomorphes, Greece. Sustainability, 13(12), 6626.*
5. *Havenith, H. B., Umaraliev, R., Schlögel, R., Torgoev, I., Ruslan, U., Schlogel, R., &Torgoev, I. (2017). Past and potential future socioeconomic impacts of environmental*

ISSN: 2321-3914
Volume:2 Issue:2
May 2024
Impact Factor:11.9
Subject: Humanities

hazards in Kyrgyzstan. Kyrgyzstan: Political, Economic and Social Issues. Edited by Oliver A. Perry. New York: Nova Science Publishers.

6. *Korjenić, A., Banda, A., &Mehić, A. (2020). GEOECOLOGICAL CONTENTS IN THE GEOGRAPHY CURRICULUM IN ELEMENTARY SCHOOLS OF THE CANTON OF SARAJEVO, 2003-2018. GEOGRAFSKI PREGLED GEOGRAPHICAL REVIEW Number 43, 47.*
7. *Koupatsiaris, A. A., &Drinia, H. (2024). Expanding Geoethics: Interrelations with Geoenvironmental Education and Sense of Place. Sustainability, 16(5), 1819.*
8. *Kubyshkina, E. N., Urazmetov, I. A., &Ulengov, R. A. (2018). School geoecological monitoring in shaping of ecological competence. International Multidisciplinary Scientific GeoConference: SGEM, 18(5.4), 249-256.*
9. *Lassche, M. R., &Molendijk, M. A. (2011). Survey report: exploration of geospatial course supply and demand in Central Asia.*
10. *Narimon, A. D. N. K. J. (2023). SCIENTIFIC AND PEDAGOGICAL FOUNDATIONS OF THE FORMATION OF GEOECOLOGICAL CULTURE OF SCHOOLCHILDREN. Confrencea, 6(6), 233-240.*
11. *Patterson, L. A., &Harbor, J. (2005). Using assessment to evaluate and improve inquiry-based geoenvironmental science activities: Case study of a middle school watershed e. coli investigation. Journal of Geoscience Education, 53(2), 204-214.*
12. *Rikhvanov, L. P., Jazikov, E. G., Arbuzov, S. I., Bolsunovskaya, L. M., &Matveenko, I. A. (2008). GUIDE BOOK GEOECOLOGICAL EDUCATIONAL TRAINING IN KHAKASIA.*
13. *Simonyan, G. S., &Sarsekova, D. N. (2024). Analysis of ecological state of wood and shrub vegetation in Armenia and Kazakhstan by the Armenian index of environmental quality.*
14. *Steichen, E. M., Bhandari, A. L. O. K., Hutchinson, S. L., Reddi, L. N., Steward, D. A. V. I. D., & Erickson, L. E. (2006). Improving interdisciplinary geoenvironmental engineering education through empowerment evaluation. International Journal of Engineering Education, 22(1), 171.*

ISSN: 2321-3914
Volume:2 Issue:2
May 2024
Impact Factor:11.9
Subject: Humanities

15. *Zafeiropoulos, G., Drinia, H., Antonarakou, A., &Zouros, N. (2021). From geoheritage to geoeducation,geoethics and geotourism: A critical evaluation of the Greek region. Geosciences, 11(9), 381.*

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