

«مقاله پژوهشی»

مقایسه دیدگاه دانش‌آموزان درباره اثربخشی کاربرد آموزش الکترونیکی در یادگیری درس جغرافیا

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چکیده

آموزش جغرافیا با استفاده از ابزارهای دیجیتال و الکترونیکی می‌تواند نحوه ارائه مفاهیم و اشکال جغرافیایی به دانش‌آموزان را بهبود بخشد، فرصت‌هایی را برای تجارب یادگیری فراهم کند و آموزش و ارزشیابی فردی را تسهیل کند. علاوه بر این، فناوری می‌تواند به معلمان در طراحی و ارائه درس جغرافیا و پیگیری پیشرفت و عملکرد دانش‌آموز با ارائه دستورالعمل‌های خاص برای رفع نیازهای متنوع دانش‌آموزان حمایت کند. بر این اساس، هدف پژوهش حاضر، مقایسه دیدگاه دانش‌آموزان درباره اثربخشی کاربرد آموزش الکترونیکی در یادگیری درس جغرافیا در شهر میسان عراق بود. نوع تحقیق، توصیفی-پیمایشی و جامعه آماری شامل کلیه دانش‌آموزان شهر میسان به تعداد ۱۲۳۴۷ نفر بود که از میان آنها به روش نمونه‌گیری تصادفی طبقه‌ای و از طریق فرمول کوکران، تعداد ۲۸۰ دانش‌آموز انتخاب شدند. در پژوهش حاضر از پرسشنامه محقق ساخته ارزیابی کیفیت آموزش الکترونیکی درس جغرافیا در قالب ۴۲ سؤال و پنج مولفه (کیفیت تدریس، مدیریت کلاس، شیوه ارزشیابی، کیفیت سامانه و کیفیت برگزاری کلاس) استفاده شد. اعتبار محتوایی و سازه پرسشنامه ارزیابی کیفیت آموزش الکترونیکی درس جغرافیا تایید شد. همچنین از طریق ضریب آلفای کرونباخ، پایایی پرسشنامه ارزیابی کیفیت آموزش الکترونیکی درس جغرافیا، ۰/۸۸ بدست آمد. تحلیل داده‌ها از طریق برنامه آماری اس.پی.اس.اس نسخه ۲۷ و ایموس گرافیک انجام شد. نتایج نشان داد وضعیت کیفیت آموزش الکترونیکی درس جغرافیا در ابعاد کیفیت تدریس، کیفیت سامانه آموزش و کیفیت مدیریت کلاس، بالاتر از حد متوسط و در مولفه شیوه ارزشیابی و کیفیت برگزاری کلاس پایین‌تر از حد متوسط بود.

واژه‌های کلیدی

آموزش الکترونیکی، کیفیت آموزش، درس جغرافیا، دانش‌آموزان.

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ORIGINAL ARTICLE

The Comparing students views on the effectiveness of using e-learning in learning geography in the city of Maysan

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ABSTRACT

The use of digital and electronic tools in geography education can enhance how geographic concepts and features are presented to students, provide opportunities for hands-on learning experiences, and facilitate individualized instruction and assessment. Furthermore, technology can support teachers in designing and delivering geography lessons, as well as in tracking student progress and performance by offering tailored instruction to meet diverse learning needs. Accordingly, the present study aimed to compare students' perceptions regarding the effectiveness of e-learning in geography education in the city of Maysan, Iraq. The research employed a descriptive-survey design. The statistical population consisted of all students in Maysan (N=12,347), from which a sample of 280 students was selected using stratified random sampling and the Cochran formula. A researcher-made questionnaire comprising 42 items across five components (teaching quality, classroom management, assessment method, system quality, and class delivery quality) was used to evaluate the quality of e-learning in geography. The content and construct validity of the questionnaire were confirmed, and its reliability, as measured by Cronbach's alpha, was 0.88. Data were analyzed using SPSS version 27 and the Amos Graphic modeling program. The results indicated that the quality of e-learning in geography was above average in terms of teaching quality, system quality, and classroom management quality, but below average in terms of assessment method and class delivery quality.

KEYWORDS

E-Learning, Quality of Education, Geography Lesson, Students.



Introduction

Geography is a science that studies and investigates the Earth, its natural and human environments, and enables the examination of diverse human activities, their relationships, and their interactions with the surrounding environment. The World Geography Charter deems geography education essential for developing active and responsible citizens in the present and future world. It asserts that geography can be an informative, empowering, and exciting subject across multiple educational levels, enhancing students' enjoyment of life and their understanding of the world around them. Furthermore, the study of geography helps learners comprehend how places are formed, how people interact with the environment, the growing consequences of spatial decisions, and diverse, interconnected cultures and societies. Thus, geography education is a significant and vital subject, serving as a source of awareness for citizens in this century who recognize they live in a profoundly interconnected world. Geography also equips learners to address questions concerning sustainable living and to learn how to coexist peacefully with the natural environment (Alaric, 2010).

One approach to developing the theoretical and practical foundations of geography is to enhance the quality of its instruction, as quality education contributes to the quality of student learning and yields individual, social, and developmental benefits for both the individual and society (Latif et al., 2019). One teaching method and set of tools that can aid in improving educational quality is the use of various virtual and electronic tools in education. E-learning, as a form of distance education, utilizes digital platforms and resources to deliver educational content to students (Harris

et al., 2016). These technologies undoubtedly enable the expansion and development of educational opportunities. According to Lone et al. (2023), e-learning allows students to acquire information at their own pace (Puma, 2022). These benefits are also applicable to geographical knowledge. For instance, Phillips et al. examined the use of immersive 3D geovisualization, revealing a wide range of benefits such as a better grasp of the study area, increased engagement with data, and heightened motivation. Their findings suggest that immersive 3D visualization enhances learning effectiveness in education (Nelson et al., 2019).

However, the quality of teaching and the use of e-learning and digital learning methods vary among teachers. The researchers investigated whether a relationship exists between the effectiveness of teaching quality and the electronic tools used in instruction, and factors such as teachers' educational background, degree, gender, age, teaching experience, pedagogical content knowledge, technological pedagogical content knowledge, teacher burnout, teaching style, academic achievement, course difficulty, course type, and teaching evaluation. Studies indicate a complex relationship between teaching quality, teacher characteristics, and lesson topic (Salvoviita et al., 2021; Sacre et al., 2023; Li et al., 2022).

With the growth and advancement of technology and teaching methods, education has become more diverse, accessible, and personalized. The emergence of online learning platforms and programs, interactive tools, and virtual classrooms has transformed how students interact with and engage information. Beyond memorizing facts and figures, the goal of education is to equip and prepare students with the skills necessary to succeed in a rapidly

and dramatically changing world. In scientific practice, the value of modern technology for geographical research has long been recognized and is now indispensable (Gottwald et al., 2021). Geographic Information Systems (GIS) have largely replaced printed media and maps in scientific and applied fields (Malaainine et al., 2021). Spatial analysis has reached a new level through Global Positioning Systems (GPS) and remote sensing technologies, such as satellite-based or airborne surface scanning at any scale (Ludwig et al., 2020). In this regard, geography education using digital and electronic tools can improve how geographical concepts and spatial forms are presented to students, provide opportunities for hands-on learning experiences, and facilitate individualized instruction and assessment. Moreover, technology can assist teachers in designing and delivering geography lessons, and in tracking student progress and performance by offering specific guidance tailored to meet students' diverse needs. Therefore, to effectively respond to the rapid pace of technological innovation and changing educational environments, it is essential to thoroughly examine e-learning methods, their effectiveness, and the factors influencing their successful implementation (Alqahtani & Rajkhan, 2020). Accordingly, the aim of the present study was to compare students' perspectives on the effectiveness of using e-learning in learning geography in the city of Maysan, Iraq.

Literature review

Kurniaaj et al. (2022) examined the effect of e-learning on students' understanding of geography at the University of Veterans of Bangun Nusantara using an experimental method. Their findings demonstrated that e-

learning positively impacted students' comprehension levels, which increased following its implementation. In a similar vein, Yahiaoui et al. (2022) conducted a survey to assess the impact of e-learning systems on student motivation and academic outcomes during the COVID-19 pandemic at Algerian universities. Their results indicated that student motivation—encompassing attention, communication, trust, and satisfaction—and student outcomes—including knowledge, skills, and attitudes—were significantly influenced by e-learning systems.

Niu et al. (2023), in a systematic review of virtual reality (VR) technologies in geography education, concluded that VR can facilitate student immersion into virtual learning environments. They found that multisensory teaching experiences through VR enhance student engagement and satisfaction. The review highlighted that simulation technology can create realistic virtual environments, enabling effective virtual visualization in educational settings. Similarly, Asmororini et al. (2024) conducted an experimental study on the impact of online Geographic Information System (GIS) media on the collaborative skills and learning outcomes of students at Mojo Government High School. Their research revealed that using online GIS as a learning medium significantly improved both collaborative skills and learning progress compared to conventional teaching tools.

Shifting focus to implementation challenges, Angala & Rafi (2025) explored how teachers address the integration of Information and Communication Technology (ICT) into geography classes to improve map-reading skills in Namibian secondary schools. Through semi-structured interviews with 15 geography teachers, they identified a need for ICT-enabled

classrooms, effective learning management systems, and computer-based teaching programs. The study also highlighted significant barriers, including inadequate resources, insufficient technological infrastructure, and a lack of teacher training in the pedagogical application of ICT. Complementing this, Kadhim & Cochrane (2025) surveyed 100 students on the impact of ICT tools on motivation. Their findings showed that tools like Google Earth significantly boosted student motivation, with virtual field trips increasing enthusiasm for learning geography. The integration of ICT tools was also found to foster a deeper understanding of geographical concepts and promote a more collaborative, interactive, and inclusive learning environment.

Further examining specific tools, Elvis-Njoku & Agwu (2025) investigated the effect of using Google Earth to teach concepts in high school geography through an experimental method. Their study confirmed a positive effect on teaching and learning; however, it also identified a lack of digital skills among high school teachers as a major obstacle to leveraging ICT integration fully. Maganga & Srivastava (2025) explored the impact of digital technology on map-reading and interpretation skills in Tanzanian secondary schools via an experimental study. Their results affirmed that digital tools enhance the overall quality of geography education.

Given the increasing proliferation of virtual education and the shift of instruction into cyberspace, maintaining educational standards and quality has become a paramount task for education systems. Evaluating the quality of e-learning and its associated systems provides policymakers and educational planners with critical data. Such evaluation enables the identification of strengths and weaknesses in

programs and systems, facilitating necessary corrective measures to address existing problems. It is anticipated that the results of this study will offer valuable insights into the effectiveness and success of e-learning within the Iraqi education system. E-learning systems present both opportunities and challenges for teachers and students alike. Consequently, researchers continue to investigate whether e-learning can achieve academic outcomes comparable to face-to-face instruction. Based on this theoretical and empirical foundation, the present study aims to examine students' perspectives on the effectiveness of e-learning in teaching geography across five key components: teaching quality, classroom management, evaluation methods, system quality, and class delivery quality.

Research Method

Design

The research was applied in terms of its purpose and descriptive-survey in terms of its implementation method.

Participants

The statistical population of this study consisted of all students in the city of Maysan, totaling 12,347 individuals. Using the Cochran formula and stratified random sampling method, a sample size of 280 students was selected. Out of these, 260 correct and complete questionnaires were returned, resulting in a response rate of 0.93.

Instrumentation

In this study, a researcher-made questionnaire was employed to evaluate the quality of e-learning in geography. The questionnaire comprised 42 items across five components: teaching quality, classroom management, evaluation methods, system quality, and class

delivery quality. Responses were collected using a five-point Likert scale ranging from "very high" to "very low." To ensure validity, both content validity and construct validity

were assessed. The content validity of the e-learning quality evaluation questionnaire was confirmed by five professors specializing in educational sciences.

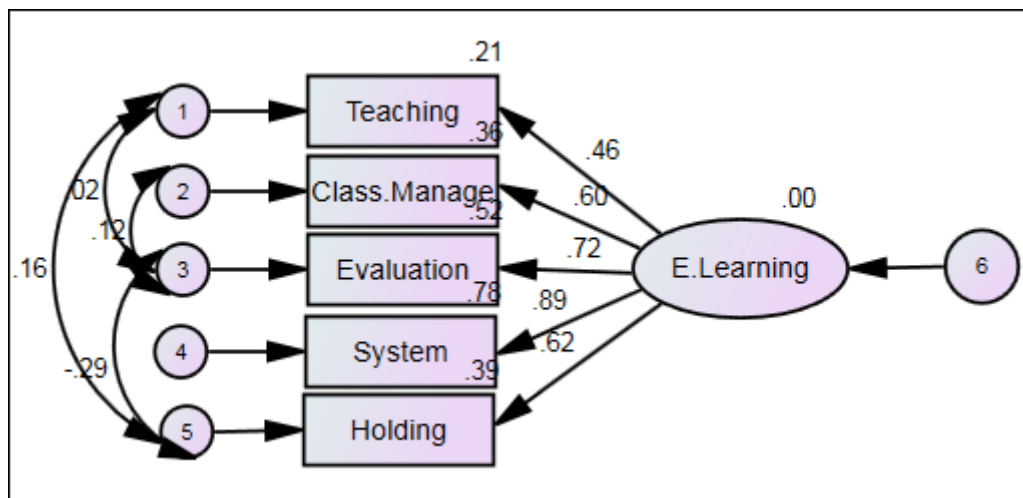


Figure 1. Measurement model of the e-learning quality assessment

Additionally, confirmatory factor analysis (CFA) was conducted to examine the construct validity of the e-learning quality questionnaire. The results confirmed the validity of the construct, indicating that the component for system quality had the highest factor loading at 0.89, while the teaching quality component had the lowest factor loading at 0.46. The model fit indices—IFI, CFI, RFI, GFI, and NFI—all exceeded 0.90, the RMSEA value was below 0.08, and the CMIN/df ratio was below 3. These results demonstrate that the measurement model of the geography e-learning quality assessment questionnaire fits appropriately with the conceptual model and the collected data. To ensure the reliability of the questionnaire, Cronbach's alpha coefficient was calculated, yielding a value of 0.88.

Data Analysis

Data obtained from the geography e-learning quality assessment questionnaire were analyzed using SPSS 27 and Amos Graphic software. At the descriptive level, frequency, percentage, mean, standard deviation, skewness, and kurtosis were calculated. At the inferential level, a one-sample t-test, independent t-test, and one-way ANOVA were employed.

Results

A review of the demographic characteristics of the respondents indicates that, out of a total of 260 participants in this study, 115 (44%) were male and 145 (56%) were female. Regarding academic performance, approximately 12% reported a grade point average (GPA) below 12, 12% had a GPA between 12 and 14, 35% had a GPA between 14 and 16, 35% had a GPA between 16 and 18, and 6% had a GPA above 18.

Table 1. Normal distribution of the e-learning variable

N	Valid	260
	Missing	0
Skewness	-1.19	
Kurtosis	2.78	

According to Table (1), the skewness of the e-learning variable is in the range (-2 to+2) and its kurtosis is in the range (-3 to+3); therefore,

the data of the e-learning variable can be assumed to be normal.

Table 2. Comparison of students' views on the effectiveness of e-learning application with criterion score 3

Variables	Mean	Std. Deviation	t	Sig	Confidence Interval	
Teaching Quality	3.24	.73	5.47	.001	.16	.34
Class Management	3.05	.76	1.048	.30	-.04	.14
Evaluation Quality	2.98	.98	-.254	.800	-.13	.10
System Quality	3.13	.94	2.24	.026	.02	.25
Holding Quality	3.00	.65	.235	.82	-.07	.08
E.Learning Quality	3.08	.61	2.24	.026	.01	.16

The results presented in Table (2) indicate that the mean of students' views on the effectiveness of using e-learning in geography lessons exceeds the criterion score for the components of teaching quality, classroom management, and system quality. For the evaluation method component, the mean is slightly below the criterion score, while for the

class holding quality component, it is equal to the criterion score, representing an average level. The one-sample t-test reveals that the differences from the criterion score are statistically significant for the dimensions of teaching quality and system quality, but not for the dimensions of classroom management, evaluation method, and class holding quality.

Table 3. Comparison of the effectiveness of e-learning from the perspectives of male and female students

Variables	Gender	N	Mean	Std. Deviation	t	Sig
E.Learning	Female	145	3.05	.59	-1.096	.27
	Male	115	3.13	.62		

According to Table (3), the mean score for the perceived effectiveness of e-learning in geography was higher among male students

than among female students. However, an independent t-test indicated that this difference was not statistically significant.

Table 4. Comparison of the effectiveness of e-learning from the perspective of students based on academic average

Grade	N	Mean	Std. Deviation	F	Sig
12	30	3.11	.56	.57	.68
12-14	31	3.18	.54		
14-16	92	3.09	.62		
16-18	92	3.07	.61		
18-20	15	2.89	.772		
Total	260	3.08	.61		

Based on the results presented in Table (4), the mean score for perceived e-learning effectiveness in geography lessons was higher among students with a grade point average (GPA) in the 12-14 range compared to students in other GPA categories. A one-way ANOVA test confirmed that this observed difference was not statistically significant.

Discussion & Conclusion

The results of this study indicated that the quality of e-learning in geography was rated above average in terms of teaching quality, system quality, and classroom management quality, while the components of assessment method and class delivery quality were at or below average. These findings reflect students' relative satisfaction with aspects such as the provision of multimedia teaching aids, instructional creativity, effective teacher interaction, and content flexibility; however, assessment methods and class delivery infrastructure require attention and improvement. Statistical analyses showed no significant difference in the perceived effectiveness of e-learning based on gender or GPA. The present findings are consistent with studies emphasizing enhanced understanding and learning progress through e-learning, such as Fatani (2020), Kurniaaji et al. (2022), Asmororini et al. (2024), and Elvis-Njoku &

Agwu (2025), but contrast with research pointing to the limitations of this method in regions with weak infrastructure, such as Adnan & Anwar's (2020) study in Pakistan. This study highlights the need for educational systems to focus on improving assessment methods and the technical quality of class delivery while maintaining existing strengths.

The results indicated that the quality of e-learning in geography was above average in the dimension of classroom management quality. These findings suggest that, within this component, students perceived teachers as relatively capable in several areas: using time appropriately and preventing wastage, starting and ending classes on schedule, ensuring active student attendance and attention, managing student absences, maintaining appropriate interaction during lessons, fostering a positive attitude toward online classes, and creating opportunities for student collaboration. Overall, classroom management was evaluated positively. Consistent with these results, Yahiaoui et al. (2022) demonstrated that student motivation (attention, communication, trust, and satisfaction) and student outcomes (knowledge, skills, and attitudes) are significantly influenced by e-learning systems. In contrast, Adnan & Anwar (2020) found that online learning may not be a suitable method for facilitating face-to-face interaction with

instructors and receiving feedback in contexts such as Pakistan, while Torres Martín et al. (2021) reported student dissatisfaction with digital educational processes, teacher roles, responsibilities, and instructional beliefs in e-learning environments.

The results showed that the quality of e-learning in geography lessons was below average in the evaluation method dimension. These findings indicate that, from the students' perspective, teachers were perceived as lacking in several areas: creativity and diversity in assigning tasks, setting clear deadlines for assignments within the system, providing feedback on submitted work, preparing a bank of test questions, using randomized questions in assessments, and offering timely feedback on student performance in tests or assignments. Consequently, students rated the evaluation methods as relatively weak. In this regard, Keykha et al. (2025) identified challenges related to electronic testing, including complexity, post-test issues, and weak infrastructure, while Albrahim (2020) noted weaknesses such as unclear scoring criteria, insufficient continuous assessment, and misalignment between evaluation and learning objectives in e-learning. Contrary to the results of the present study, Zaer Sabet et al. (2020) highlighted the advantages of electronic testing, such as saving instructors' time, ensuring discipline and regulation, reducing cheating, saving paper, and supporting the economy. They argued that with sufficient improvements, electronic testing could serve as an innovative tool for learning and teaching in higher education.

The results indicated that the quality of e-learning in geography was above average in terms of system quality. These findings show that, within the system quality component, students reported the following aspects as

desirable: the conditions for accessing the system, its aesthetic and attractive interface, the ability to re-enter the system during a class, the provision of a stable link for joining the class, system features that facilitate teacher-student interaction during instruction, access to recorded sessions via mobile phone, opportunities for students to contribute to content creation within the system, the correct display of exam questions, ease of submitting answers at the exam's conclusion, and reliable system reconnection after disconnection. In this regard, Angala & Rafi (2025) identified barriers such as a lack of resources, technological infrastructure, and teacher training as shortcomings in applying ICT to geography education. Conversely, Dana et al. (2019) evaluated the quality and desirability of e-learning courses at Tarbiat Modares University from the perspectives of students and experts, rating system quality as undesirable. Similarly, Ahmadi & Mohammadi (2022) assessed the learning management system at Shahid Rajaei University's virtual training center, finding the operability and reliability components at a low level, usability at a high level, and efficiency at an average level.

The results indicated that the quality of e-learning in geography was below average in the class quality component. These findings show that, within this component, students believed the e-learning system performed poorly in several areas: viewing the teacher's live video during classes, holding sessions strictly according to the scheduled timetable, facilitating student presentations or lectures in online classes, enabling student microphones, uploading educational files by the teacher, providing extended access to older recorded sessions, allowing students to turn on their webcams, and offering downloadable recorded class files in separate audio and video formats.

Overall, students reported this component as undesirable. In this regard, Palmentieri (2022) identified challenges in e-learning for geography, such as gauging students' actual attention (particularly with cameras turned off), reduced interaction during Q&A and practical labs (e.g., paper map exercises), and difficulties in transitioning back to in-person instruction. Similarly, Dana et al. (2019) evaluated the quality and desirability of courses delivered through the e-learning center at Tarbiat Modares University as undesirable from both student and expert perspectives regarding class delivery quality. In contrast, Kadhim & Cochrane (2025) demonstrated that the use of tools like Google Earth significantly boosts student motivation and that virtual field trips increase enthusiasm for learning geography.

Practical Suggestions

- Given the central role of learners as the primary stakeholders in the virtual education system, achieving their satisfaction is a key priority for its designers and administrators, representing a critical success factor. Therefore, it is recommended to actively incorporate their constructive feedback throughout all stages of planning, designing, delivering, and evaluating educational services.

- Considering the perceived weaknesses in certain components of e-learning from the students' perspective, it is suggested that administrators and educators conduct a comprehensive evaluation of their strengths and shortcomings in the areas of teaching quality, classroom management, evaluation methods, system quality, and class delivery quality. Targeted interventions should then be implemented to reinforce strengths and address the identified weaknesses within the e-learning framework.

- To optimize outcomes in online education, the adoption of advanced pedagogical methods and appropriate technologies is essential. Geography, as a data-rich and evolving discipline, can leverage digital tools to enhance collaborative learning processes. This approach will help future-proof the education system, ensuring its resilience even if remote learning becomes necessary again.

- While students expressed relative satisfaction with teaching methods, their satisfaction with evaluation methods was lower. To create a more effective learning environment, teachers are encouraged to focus on utilizing modern pedagogical techniques and developing assessment strategies that are well-suited to the dynamics and tools of the e-learning system.

- The Iraqi Ministry of Education is advised to strengthen technology integration in classrooms by implementing proactive measures. These should include providing continuous professional development workshops for teachers, updating educational policies to support digital learning, and allocating sufficient ICT resources to improve digital infrastructure and bridge the digital divide, thereby ensuring more equitable access and effectiveness.

Research Suggestions

- It is recommended that studies similar to the present research be conducted in other academic disciplines, such as engineering, physics, chemistry, mathematics, and the social sciences, to allow for comparative analysis and a broader understanding of e-learning effectiveness across different fields.

- Future research should expand its scope beyond students, who represent one key stakeholder group, to also incorporate and

examine the perspectives of other crucial participants in the e-learning process, such as teachers, professors, and instructional designers.

- Further investigation into the impact of experiential learning strategies on student motivation and academic progress in geography is warranted. Specifically, research should explore the integration of Geographic Information Systems (GIS) and geolocation applications into learning experiences. To facilitate this, it is recommended that digital and professional competencies be integrated into geography teacher education programs, preparing educators to design smart, flexible classrooms that meet the needs of learners in the digital age.

- Future studies should investigate the technical, pedagogical, and administrative requirements for upgrading and sustainably improving the quality of e-learning platforms and their supporting infrastructure.

- Conducting comparative studies on the implementation, challenges, and outcomes of e-learning in different subject areas across various countries is suggested. Such research would help identify cross-cultural best practices and contextual factors influencing the success of digital education.

Conflict of Interest

This article has no conflict of interest and has not been published in any other publications. It has been submitted to the Quarterly of Iranian Distance Education Journal for review and publication.

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