

The Educational, Economic and Social Impacts of E-learning Systems on Undergraduate Students

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Abstract

This quantitative study examined the impact of e-learning systems on 531 undergraduate students across disciplines and demographics. An online questionnaire assessed economic, educational, and social dimensions. Results revealed generally positive impacts, with 92-99% agreeing e-learning reduces costs. Most (81-97%) reported enhanced educational experiences via flexibility and interactivity. However, 51-92% identified negative sociological effects like isolation and lost relationships. While increasing access and enabling self-paced learning, findings suggest e-learning may diminish peer connections compared to traditional classrooms. Additional research on instructional design and university integration of online learners is needed to realize the academic promise of virtual education while supporting social integration.

Keywords: *e-learning systems, undergraduate students.*

Introduction

The 21st century has witnessed an unprecedented revolution in education, driven by the rapid advancement of digital technologies. This transformation has given rise to e-learning systems, a paradigm shift that has left an indelible mark on the landscape of undergraduate education. E-learning is a mode of education that leverages digital platforms and tools to deliver instructional content and facilitate learning experiences. This shift has been particularly significant at the undergraduate level, where traditional classroom-based education is increasingly being supplemented, and sometimes even replaced, by online learning opportunities. Many higher education institutions, including universities, have adopted e-learning as a tool they use to provide students with educational material. However, they face many challenges that hinder the application of e-learning (Abu-Al-Aish, 2021: 49). The impact of e-learning on undergraduate students has become a topic of great interest and discussion in both academic and practical circles. The accessibility, flexibility, and interactive potential of e-learning platforms have prompted educators and institutions to explore their potential benefits for enhancing student engagement, improving learning outcomes, and reshaping the traditional classroom dynamics. However, the extent of these benefits and their potential drawbacks warrant careful investigation, especially considering the diverse learning preferences, technological competencies, and socio-economic backgrounds of undergraduate students. As this phenomenon continues to evolve, it has profound implications in many critical domains such as economics, education, and sociology (Derbas et al., 2023: 2).

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The economic dimension of e-learning holds significant implications for the financial aspects of higher education and the broader economy. E-learning has emerged as a force that challenges traditional notions of educational costs, affordability, and accessibility. In recent years, studies (Abduljawad et al., 2020: 84) have consistently highlighted the potential cost savings associated with e-learning for undergraduate students. By eliminating the need for physical infrastructure and enabling remote access to educational materials, e-learning can significantly reduce the financial burden on students. Students can forego expenses such as commuting, housing, and physical textbooks, leading to substantial cost savings. Moreover, the flexibility offered by e-learning often allows students to maintain part-time employment, further enhancing their economic well-being. However, it is crucial to acknowledge that the economic impact of e-learning is not uniform across all students. Disparities in access to technology and high-speed internet can exacerbate inequalities, as economically disadvantaged students may face barriers to fully engaging with e-learning (Zarei & Mohammadi, 2022: 85563). Additionally, while e-learning can reduce certain costs, the initial investment in technology and infrastructure can pose financial challenges for institutions and students.

The educational realm has been at the forefront of the e-learning revolution, with digital technologies fundamentally altering pedagogical approaches and learning outcomes. E-learning has introduced new opportunities for customization, flexibility, and engagement, challenging traditional classroom paradigms. Research indicates that e-learning can enhance the learning experiences of undergraduate students (Samson & Ian, 2008: 297). One of its primary strengths lies in the flexibility it offers. Students can access course materials and lectures at their convenience, catering to diverse learning styles and schedules. Additionally, e-learning often incorporates interactive elements, multimedia resources, and collaborative tools, which can significantly improve student engagement and retention. However, it is essential to approach the educational impact of e-learning with a nuanced perspective. While it offers several advantages, its effectiveness hinges on various factors. The quality of instructional design, the motivation of students, and the availability of online resources all play pivotal roles in determining educational outcomes (Karaksha et al., 2014: 10). Moreover, concerns have arisen regarding issues like online cheating and the potential reduction in social interaction compared to traditional classroom settings (Kelum et al., 2013: 5).

Beyond economics and education, E-learning has unleashed a series of sociological shifts that redefine the social dynamics and interactions within educational settings. It has both connected and isolated students, offering a globalized learning environment while posing challenges to social integration. E-learning has the potential to foster a globally connected educational experience, breaking down geographical barriers (Stone et al., 2018: 2). Students from diverse backgrounds and locations can interact, collaborate, and share perspectives, enriching the educational experience with a global perspective. Additionally, it empowers non-traditional students, such as working adults or parents, to pursue higher education without relinquishing their existing social roles. However, concerns have emerged regarding the sociological impact of e-learning, particularly regarding social presence and interpersonal relationships. While e-learning offers opportunities for collaboration, the quality and depth of online interactions may not match those of face-to-face learning environments. Issues related to social isolation and reduced social presence have been raised (Alomoto et al., 2022: 227). E-learning systems have the potential to shape the sociological fabric of undergraduate education by fostering global connections and inclusivity. However, they also present challenges related to social interaction and community-building, which necessitate careful consideration and mitigation.

E-learning system, as one of the recent technologies in the education sector, has brought many opportunities for both students and educators to facilitate the learning process. Higher Education has employed E-learning systems in various universities around the

world in order to deliver learning to all who want and seek it, and the objective of this study is to seek the impact of e-learning systems on undergraduate students. Therefore, this research aims to identify the impact of using the e-learning system on the students of Al-Zaytoonah University. By using quantitative statistical analysis by percentages, this study was conducted on a sample of students from Al-Zaytoonah University of Jordan of both genders (male and female students) who used the e-learning system and from scientific and human faculties and different educational levels.

The remainder of this research is organized as follows. Section 2 presents a review of relevant prior literature. Section 3 explains the research methodology. Finally, Section 4 presents the results of the study and their analysis, and Section 5 concludes the study with the conclusions reached in this study.

Related Work

This related work explores the impact of e-learning systems on undergraduate students. Several studies (Al-Adwan et al., 2022; Bond et al., 2018; Gamage et al., 2020; Rapanta et al., :2020) have found that e-learning can reduce the overall cost of education for students. It decreases commuting expenses, housing costs, and the need for physical textbooks. Moreover, e-learning often allows students to work part-time while pursuing their degrees, further enhancing their economic well-being. However, some scholars caution that the digital divide and the initial investment in technology may pose barriers to economically disadvantaged students.

E-Learning's Transformative Influence on Undergraduate Education, the research indicates that e-learning can enhance students' learning experiences. It provides flexibility in scheduling, allowing students to access course materials at their convenience, which can cater to different learning styles. Additionally, e-learning often incorporates interactive elements, multimedia resources, and collaborative tools, which can improve student engagement and retention. However, it is essential to acknowledge that the effectiveness of e-learning depends on various factors, including instructional design, student motivation, and the quality of online resources.

Some studies have also raised concerns about issues like online cheating and a potential lack of social interaction compared to traditional classroom settings. E-learning can influence the social aspects of education in several ways. First, it can break down geographical barriers, enabling students from diverse backgrounds and locations to interact and collaborate. This fosters a globalized and culturally enriched learning environment. Second, e-learning can empower non-traditional students, such as working adults or parents, to pursue higher education without sacrificing their existing social roles. However, some researchers suggest that e-learning may lead to social isolation and reduced face-to-face interactions (Fask et al., 2015; Gillett-Swan, 2017; Lai & Hwang, 2016; Bernard et al., 2014; Andersson et al., 2014).

Social presence in online courses can vary, and students may miss out on the interpersonal relationships and networking opportunities that traditional education offers. E-learning has the potential to foster a globally connected educational experience, breaking down geographical barriers (Mukhopadhyay, 2023: 66). Students from diverse backgrounds and locations can interact, collaborate, and share perspectives, enriching the educational experience with a global perspective. Additionally, it empowers non-traditional students, such as working adults or parents, to pursue higher education without relinquishing their existing social roles. However, concerns have emerged regarding the sociological impact of e-learning, particularly regarding social presence and interpersonal relationships. While e-learning offers opportunities for collaboration, the quality and depth of online interactions may not match those of face-to-face learning environments

(Parvaei & Mirhosseini, 2023: 167). Issues related to social isolation and reduced social presence have been raised.

The main research question that we aim to answer in this study is What is the impact of e-learning systems on undergraduate students? And this question can be answered through the following sub-questions?

What is the educational impact of e-learning systems on undergraduate students?

What is the economic impact of e-learning systems on undergraduate students?

What is the social impact of e-learning systems on undergraduate students?

The Proposed Method

The study used an analytical descriptive approach, employing appropriate statistical analyses. It involved students from Al-Zaytoonah University of Jordan, with a sample size of 531 students who agreed to participate and completed an online questionnaire chosen randomly. To address the study's research questions, a questionnaire with two sections was administered. The first section collected demographic information, while the second part contained fifteen items rated on a 3-point Likert scale, ranging from 1 (strongly agree) to 3 (strongly disagree). The questionnaire was distributed electronically via a link sent to the students during the second semester of the academic year 2022/2023.

Before distribution, the questionnaire was subjected to evaluation by experts in scientific research and teaching at Jordanian universities. They assessed the clarity and comprehensiveness of the E-learning system. Based on their feedback, the questionnaire was revised and improved. Participants were assured that their data and personal details would remain confidential, and they had the option to withdraw from the study at any time.

The study's procedures encompassed several key steps. Initially, an extensive review of relevant references, studies, and research about the study's subject matter was undertaken. Subsequently, a questionnaire was meticulously crafted. This preliminary questionnaire was subjected to the scrutiny of a panel of experts, leading to the refinement of the final questionnaire version. Following this, the questionnaire was adapted into an electronic format to facilitate distribution and streamline the process of gathering and analyzing data. The survey was then disseminated among the study's participants via electronic messages. The data collected were subjected to thorough statistical analysis.

Results and Discussions

A. Presenting the Data of the Research Sample

Table 1. The data of the research sample

Variables	Levels	Frequency	Percentage
Status of work	Working	138	%26
	Not Working	393	%74
Nationality	Jordanian	414	%78
	Non-Jordanian	117	%22
Gender	Male	252	%47
	Female	279	%53
Collage	Scientific	279	%53

Academic level	Humanity	252	%47
	First-year	201	%38
	Second year	93	%18
	Third year	102	%19
	Fourth and above	135	%25

Table No. (1) indicates the distribution of the characteristics of the sample according to the demographic variables, which are gender, nationality, college, educational level in years, and work status, where females constituted 53% of the sample and males 47%, and the percentage of students of Jordanian nationality was 78%. While the rest of the nationalities accounted for 22%, and students from the scientific colleges accounted for 53%, while the humanitarian colleges accounted for 47%. The distribution of students according to the academic years was as follows: first-year students accounted for 38%, second-year students 18%, and third-year students 19%. As for fourth-year students and above, the rate is 25%. The percentage of students who work is 26%, and those who do not work are 74%.

B. Presentation of data on the respondents' response

Tables 2, 3, and 4, respectively, show the respondents' responses to the impact of E-learning on undergraduate students from the following aspects: educational, economic, and social impacts.

Table 2. Educational impact

Questions/Variables	Gender		Nationality		Status of work		Collage		Academic level			
	M	F	Jor.	Other	yes	No	Sci.	Hum.	1 st	2 nd	3 rd	4 th & above
Agree on the clarity of the educational material sent by the subject teacher.	46%	50%	75%	21%	25%	71%	51%	45%	36%	16%	19%	25%
Agree to that e-learning helped students by referring them to recorded lectures.	48%	49%	74%	23%	26%	71%	51%	46%	35%	16%	20%	25%
Agree that e-learning help students to understand the study material through.	48%	49%	75%	22%	24%	73%	52%	45%	36%	16%	20%	25%
Agree that e-learning help students to attend lectures on time.	41%	40%	61%	20%	23%	58%	41%	40%	31%	11%	15%	24%
Agree that e-learning help to access educational material anywhere and at any time.	42%	40%	78%	23%	25%	76%	43%	33%	38%	11%	19%	25%

Table No. (2) shows the respondents' response to the impact of the E-learning system on undergraduate students from an educational point of view. The respondents agreed on the clarity of the educational material sent to them by the teachers of the subject 96% distributed among 50% females, of Jordanian nationality 75%, those who do not work 71%, scientific colleges 51%, and first-year students 36 %, the second 17%, the third with 19%, and the fourth and above with 25%. The response of the respondents to their agreement to assist the E-learning system by returning to the recorded lectures was 97% distributed as follows: 49% of the respondents were female, 74% those of Jordanian nationality, 71% of those did not work, and 71% of the scientific colleges had forgotten. Of the school years, 35%, 16%, 20%, and 25%, respectively. The response of the respondents to understanding the subject matter through electronic learning was 97%, as shown in Table No. (2). 81% of the students agreed that the E-learning system helped students attend lectures on time. Also, 82% of the respondents agreed to help the E-learning system to access the educational material anywhere and at any time.

Table 3. Economic impact

Questions/Variables	Gender		Nationality		Status of work		Collage		Academic level			
	M	F	Jor.	Other	Yes	No	Sci.	Hum.	1 st	2 nd	3 rd	4 th & above
Agree that e-learning reduces the material cost of going to university.	47%	52%	77%	22%	26%	73%	53%	46%	36%	17%	19%	25%
Agree that e-learning has facilitated studying and working together.	47%	50%	57%	20%	25%	72%	51%	46%	37%	16%	19%	25%
Agree that owning electronic devices and mobile phones, agree that owning for utilizing is financially expensive.	47%	52%	77%	22%	25%	74%	53%	46%	37%	18%	19%	25%
Agree that the availability of the internet is financially costly.	49%	50%	79%	20%	24%	75%	57%	42%	36%	18%	18%	27%
Agree that e-learning reduces the financial burdens of education, such as printing homework.	46%	46%	71%	21%	23%	69%	47%	45%	32%	17%	17%	26%

Table No. (3) shows the response of the respondents to the impact of the E-learning system on undergraduate students from an economic point of view, as the percentage of respondents who agreed that e-learning had reduced the financial cost of going to university by 99%, and the respondents agreed that E-learning system has facilitated studying and working together by 97%, and the percentage of the respondents agreed that

owning e-learning tools is financially expensive, such as electronic devices and mobile phones by 99%, and with the same percentage that the availability of the Internet is financially expensive, which is 99%. The respondents agreed to reduce the E-learning system from the material burdens of education, such as printing assignments, by 92%, as shown in Table No. (3), distributed according to the demographic characteristics of the respondents.

Table 4. Social impact

Questions/variables	Gender		Nationality		Status of work		Collage		Academic level			
	M	F	Jor.	Other	Yes	No	Sci.	Hum.	1 st	2 nd	3 rd	4 th above
Agree that e-learning has strengthened the relationship between faculty members & students.	27%	24%	35%	16%	20%	31%	27%	24%	16%	8%	11%	16%
Agree that e-learning reduces the student's social communication skills.	43%	49%	72%	20%	23%	69%	49%	43%	34%	18%	15%	25%
Agree that e-learning helped students to interact with each other	32%	33%	47%	18%	22%	43%	35%	30%	22%	15%	12%	17%
Agree that e-learning reduces students' desire to know new students.	41%	51%	71%	21%	24%	68%	48%	44%	36%	15%	16%	25%
Agree that e-learning led to student's feeling of loneliness.	37%	42%	64%	15%	22%	57%	44%	35%	20%	15%	17%	22%

Table 4 shows the response of the respondents to the impact of the e-learning system on undergraduate students from a social point of view. The results showed that 51% of the respondents agreed that the E-learning system had strengthened the relationship between faculty members and students. The percentage of respondents' approval that the E-learning system reduces students' social communication skills was 92%, and distance learning helped students interact with each other by 65%. The response respondents agreed that e-learning reduced students' desire to get to know new students by 92%. This led to the students feeling lonely due to the E-learning system by 79%.

Analysis, and Discussion

A. Educational Impact of E-Learning System on Undergraduate Students

The results of the study of the impact of the E-learning system on undergraduate students in terms of the educational axis indicate that there is a positive impact of the E-learning system on this axis, as the response of the respondents ranged between 81% and 97%,

and this is considered a high and positive response, as the students agreed on the ease of reference to the recorded lectures due to e-learning and their understanding of the material through E-learning system by 97%. The reason for this may be the efficiency and effectiveness of the E-learning system that is applied at the university. The reason may also be the ability of students to use the system for ease of dealing with it and the exercises that can be That the students have been exposed to on how to use the system, as the respondents did not show any differences in responding to these paragraphs depending on the variables adopted in the study and the distribution of these variables.

The respondents' response to the paragraph on the clarity of the educational material sent through the E-learning system was close to 96%, i.e., percentages close to the previous paragraphs. This may be due to the previous reasons for the efficiency and effectiveness of the e-learning system. The response of the respondents and the various variables was that the E-learning system facilitated access to the educational material at any time and place by 82% and that the E-learning system helped students attend lectures on time for various variables. Although these percentages are lower than their predecessors, they remain high and positive in terms of the impact of the E-learning system on undergraduate students in terms of the educational axis. This supports the positive impact of the E-learning system for students on the educational axis, especially in the case of students who work or have difficulty reaching the university, or if the weather conditions do not help in their access to the university. Therefore, the presence of an E-learning system helps the continuity of receiving the educational material and following it up with all Convenience for students

B. Economic Impact of E-Learning System on Undergraduate Students

The response of the respondents on the impact of E-learning systems on undergraduate students from economic whining ranged between 99%-92%, which is also considered high, and by looking at the paragraphs and their association with the variables, we assume that these percentages were related between the paragraphs and the variables. E-learning has had a positive impact in reducing the material cost of students to go to university by 99% in terms of fuel used in transportation or in terms of paying fares for means of transportation, and this constitutes a great financial burden on students and their families, and we can add here the element of time consumed to reach The university in terms of waiting, traffic congestion, and even preparation for the university itself, which relieved the students and their families of this survivor. E-learning also facilitated work and education for students at the same time by 97%, as students are able to continue to work and attend lectures on time or refer to them when needed or when time allows for that, as we find that a percentage of students prefer to join and join Universities that provide the opportunity for E-learning system, even if all subjects can, because of the ease and comfort of this matter, joining work to obtain money that supports students in relieving the financial burden on their families of university enrolment expenses, and work may also be an opportunity to obtain the required experience that enables Students can easily join the labor market after completing their university studies.

However, we find that the respondents responded to the high financial cost of obtaining and owning E-learning system tools such as computers and smartphones, which require modern technologies by 99%, because E-learning system has sophisticated conditions and needs with high technologies and high development for the user can enter the E-learning system, deal with it, and obtain the educational material he needs. This mechanism requires modern and advanced devices, and regular devices cannot access them, which constitutes a financial burden on students and their families in securing and obtaining these devices. Also, the necessary access to the Internet, which is the basis of e-learning, is financially high, and this was shown by the response of the respondents at a rate of 99%. This is because not all students have sufficient internet or even sufficient coverage and transmission so that they can continue to join the lecture and thus obtain the educational material. However, the respondents agreed that the E-learning system has

reduced the material burdens associated with handing over assignments, such as printing, by 92%, as assignments are now solved and delivered electronically through modern devices without the need to use paper and tools. On the contrary, everything is done electronically, and this is reflected also on paper waste and reduces its harm to the environment.

Through the respondents' response to the impact of the E-learning system on the economic axis, we found that it has negative and positive effects, unlike the educational axis.

C. Social Impact of E-Learning System on Undergraduate Students

By looking at Table 4, which shows the response of the respondents to the impact of the E-learning system on undergraduate students on the social axis, we find that the response rates ranged between 92%-51% for the paragraphs and their association with the variables of the study, where the respondents responded that E-learning system worked to strengthen the relationship between students and faculty members by 51% because E-learning system is learning that takes place through a virtual place where individuals do not exist face to face, but through electronic screens, which loses intimacy and feelings between students and members of the teaching staff, which reduces social communication skills. For students, at a rate of 92%, because interaction and direct and face-to-face communication enable students to have skills in dealing, communicating and communicating with others, and these skills cannot be obtained by students through screens and electronic devices. Body movement and emotions when communicating and communicating play a big role in interaction and its mechanisms, and therefore reactions are based on it, and this is what students lack in E-learning systems. This was reflected in the interaction of students with each other and their communication, as the response of the respondents was to reduce the E-learning system from the interaction of students among them by 65%, and this is a natural result due to the absence of students at the university.

E-learning also reduced students' desire to get to know new students, the students not being present at the university permanently due to the E-learning system, which depends on virtual presence instead of face-to-face, the percentage was 92%, which is high, and as we mentioned previously, this is reflected in skills. Social interaction, communication skills, and the formation of social capital are considered important and necessary for the continuity of human life. Consequently, the students' feeling of loneliness was reflected at a rate of 97%, and they became accustomed to this feeling due to the continuity of virtual interaction instead of existential interaction, which is based on the presence of individuals face to face and in the same spatial and temporal space.

Conclusion

E-learning system has had a positive and negative impact on undergraduate students from economic axis ranges. The response of the respondents on the impact of the E-learning system on undergraduate students from the economic axis ranged between 99%-92%, which is considered high. E-learning systems have the potential to positively impact the economy by increasing access to higher education and reducing the financial burden on undergraduate students. and have a negative impact according to the high cost of the E-learning system tools and equipment. However, it is crucial to address equity issues to ensure that all students can benefit from these economic advantages.

However, the results of the study of the impact of the E-learning system on undergraduate students in terms of the educational axis indicate that there is a positive impact of e-learning on this axis, as the response of the respondents ranged between 81% and 97%, and this is considered a high and positive response. E-learning systems have the potential to transform undergraduate education by offering flexible and interactive learning

experiences. However, educators must address the challenges associated with online education to maximize its educational impact.

E-learning systems can have negative sociological impacts on undergraduate students. Because the E-learning system takes place in a virtual place where individuals do not exist face to face, but through electronic screens, which a loss of intimacy and feelings between students and members of the teaching staff, which reduces social communication skills for students, and the response of the respondents to the impact of e-learning on undergraduate students on the social axis, rates ranged between 92%-51% for the paragraphs and their association with the variables of the study's.

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References

- Abdul Jawad, M., Ahmad, A., Jaber, K. M. Thunibat, A., Abu Maria, E., Khasawneh, A., Hijazi, H. (2020). Evaluating and Adopting E-learning Systems in Al-Zaytoonah University of Jordan. *International Journal of Advances in Soft Computing and its Applications*, 12(3), 82-100.
- Abu-Al-Aish, A. (2021). Using E-learning System in Jordanian Universities during the COVID-19 Pandemic: Benefits and Challenges. *Computer and Information Science*, 14(3), 49-62.
- Al-Adwan, A. S., Nofal, M., Akram, H., Albelbisi, N. A., & Al-Okaily, M. (2022). Towards a sustainable adoption of e-learning systems: The role of self-directed learning. *Journal of Information Technology Education: Research*, 21, 245-267
- Alomoto, W., Niñerola, A. & Pié, L. (2022). Social Impact Assessment: A Systematic Review of Literature. *Soc Indic Res*, 161, 225–250.
- Andersson, A., Hatakka, M., Grönlund, Å., & Wiklund, M. (2014). Reclaiming the students-coping with social media in 1:1 schools. *Learning, Media and Technology*, 39(1), 37-52.
- Bernard, R. M., Borokhovski, E., Schmid, R. F., Tamim, R. M., & Abrami, P. C. (2014). A meta-analysis of blended learning and technology use in higher education: from the general to the applied. *Journal of Computing in Higher Education*, 26(1), 87-122.
- Bond, M., Marín, V. I., Dolch, C., Bedenlier, S., & Zawacki-Richter, O. (2018). Digital transformation in German higher education: student and teacher perceptions and usage of digital media. *International Journal of Educational Technology in Higher Education*, 15(1), 1-20.
- Derbas, A., Al-Ramahi, N., Hnaif A., Alrawashdeh T. and Mubaideen R. (2023). The Effectiveness of E-Learning System on Students' of Al-Zaytoonah University of Jordan: A Case Study. In *2023 International Conference on Information Technology*, Amman, Jordan.
- Fask, A., Englander, F., & Wang, Z. (2015). On the integrity of online testing for introductory statistics courses: A latent variable approach. *Practical Assessment, Research, and Evaluation*, 20(10), 1-12.
- Gamage, K. A. A., Silva, E. K. de, & Gunawardhana, N. (2020). Online Delivery and Assessment during COVID-19: Safeguarding Academic Integrity. *Education Sciences*, 10(11), 301. <https://doi.org/10.3390/educsci10110301>
- Gillett-Swan, J. (2017). The challenges of online learning: Supporting and engaging the isolated learner. *Journal of Learning Design*, 10(1), 20-30.

- Karaksha, A., Grant, G., Nirthanan, N. Davey, A. K., Anoopkumar-Dukie, Sh., (2014). A Comparative Study to Evaluate the Educational Impact of E-Learning Tools on Griffith University Pharmacy Students' Level of Understanding Using Bloom's and SOLO Taxonomies. *Education Research International*, 2014, Article 934854.
- Lai, C. L., & Hwang, G. J. (2016). A self-regulated flipped classroom approach to improving students' learning performance in a mathematics course. *Computers & Education*, 100, 126-140.
- Mukhopadhyay, U. (2023). Impact of COVID-19 pandemic on academic performance and work-life balance of women academicians. *Asian Journal of Social Science*, 51(1), 62-70.
- Parvaei, Sh., & Mirhosseini, Z. (2023). Iranian women, e-learning, and experience of motherhood in the age of COVID-19: An analysis of mothers' lived experience of their children's e-learning. *Asian Journal of Social Science*, 51(3), 162-171.
- Rapanta, C., Botturi, L., Goodyear, P., Guàrdia, L., & Koole, M. (2020). Online university teaching during and after the COVID-19 crisis: Refocusing teacher presence and learning activity. *Postdigital Science and Education*, 2(3), 923-945.
- Samson, O. G., & Ian W. R. (2008). The Prospects for E - Learning Revolution in Education: A philosophical analysis. *Educational Philosophy and Theory*, 40(2), 294-314.
- Stone, N. J., Mara Bazley, C., Robertson, M. M., Larson, N. L., Blickensderfer, E. L., & Boring, R. L. (2018). Designing a Global Learning Environment. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 62(1), 393-397. <https://doi.org/10.1177/1541931218621090>
- Zarei, S., Mohammadi, S. (2022). Challenges of higher education related to e-learning in developing countries during COVID-19 spread: a review of the perspectives of students, instructors, policymakers, and ICT experts. *Environ Sci Pollut Res*, 29, 85562–85568.