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The Effect of E-Learning on Student Engagement in Higher Education: The Mediating Role of Student Motivation

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ABSTRACT

The fast expansion of e-learning has revolutionized higher education by offering technology-driven and flexible learning facilities. The purpose of the study is to investigate how student engagement is influenced by the use of e-learning, especially the mediation of student motivation. In particular, the paper examines how e-learning impacts student engagement, how e-learning affects student motivation and how motivation affects engagement. The quantitative research method was followed and 400 students were chosen by a convenience sampling method among higher education institutions in various provinces of Pakistan by means of a structured questionnaire. Structural equation modeling was done to analyze the data to test the proposed relationships. These findings show that e-learning shows a very positive impact on student motivation and student engagement. Moreover, student motivation is a major contributor to engagement and mediator of the connection between e-learning and student engagement. The research finds that e-learning can improve engagement among students by motivating them, and organizations are encouraged to build increasingly interactive

and motivationally based e-learning platforms. It is recommended that institutions develop interactive and motivation-driven e-learning systems.
Keywords: E-learning, Student Engagement, Student Motivation, Higher Education.

INTRODUCTION

Background of the Study

The information and communication technologies have rapidly developed, which has altered highly the situation in the sphere of higher education. Over the past years, e-learning has become one of the primary means of education delivery, which allows institutions to offer technology-driven, flexible, and accessible learning environment (Bond et al., 2020; Dhawan, 2020). With the application of online resources, the introduction of digital platforms and virtual classrooms, old fashioned teaching methods have transformed and transformed learning into more engaging and student-centered.

E-learning has gained the significance it deserves, especially in the light of the world disruption like the COVID-19 pandemic that enhanced the usage of online learning systems (Chung et al., 2020; Almaiah et al., 2020). Colleges and universities have turned to online educational platforms to offer continuity to the education process where learners can get course material, take part in discussions and also interact with the teachers at the distant educational institutions. This has made e-learning a vital part of the present-day education machinery. In spite of the extensive use, the efficacy of e-learning in improving the performance of students is a paramount field of study. Student engagement is one of the most valued results of any educational research that indicates the level of participation students take in learning processes (Martin & Bolliger, 2021). Involved students stand a better chance of expressing increased degrees of participation, perseverance and educational results. Hence, the amount of knowledge of the effect of e-learning on student engagement is of importance to both teachers and mother institutions. Besides the issue of technology, psychological elements like student motivation are also important factors in influencing the learning experiences. Motivation is a factor that helps students to be willing, putting effort and staying committed to studies (Han and Wang, 2021). Motivation is also more important in the context of e-learning where students tend to study on their own and thus, it is the motivation that will dictate the degree of engagement of the students.

E-learning has brought opportunities and challenges in the developing countries like Pakistan. Although the digital learning process provides more people with educational opportunities, infrastructure, digital literacy, and student motivation problems can interfere with its quality (Adnan and Anwar, 2020; Ali et al., 2021). Thus, the correlation of e-learning with student motivation and student engagement is the issue that has to be analyzed to ensure a better insight into how digital learning facilities can be maximized in the context of higher education.

Problem Statement

Although e-learning has been adopted rapidly in higher education, its ability

to help nurture student engagement is not clear. Digital learning environments are flexible and achieve accessibility, but they do not always guarantee active student participation and engagement (Bond et al., 2020; Martin and Bolliger, 2021). The previous studies have majorly analyzed the direct correlation between the e-learning and the engagement with less attention to the underlying psychological processes that contribute to the relationship. Specifically, mediating value of student motivation has not been studied properly. In the developing nations like Pakistan, this difference is even more significant since the issues of digital infrastructure, behavior and motivation in learning can affect the efficiency of e-learning (Adnan and Anwar, 2020). Based on this, the research aims at analyzing the impact of e-learning in student engagement by including the student motivation as one of the mediating variables in the context of higher education in Pakistan.

Significance of the Study

This research is significant in theoretical and practical aspects as far as higher education is concerned. Theoretically it adds to the current body of literature because it explores the connection between e-learning and student engagement via the mediating variable of student motivation which has not been paid much attention in previous studies. Through the combination of technological and psychological aspects, the research will offer a better insight of the behavior of the students within the digital learning settings. In simple terms the findings are very useful to learning institutions and even policy makers. The analysis of the study brings out the significance of coming up with e-learning systems that in addition to availing learning resources encourage student motivation and participation. The study presents pertinent evidence, in the context of Pakistan, to make e-learning strategies relevant in the higher education through implementation.

Aims and Objectives

The primary aim of this study is to examine the effect of e-learning on student engagement in higher education by investigating the mediating role of student motivation

- To examine the effect of e-learning on student engagement in higher education.
- To examine the effect of e-learning on student motivation in higher education.
- To investigate the mediating role of student motivation in the relationship between e-learning and student engagement.

Research hypothesis

- H1: E-learning has a significant positive effect on student engagement in higher education.
- H2: E-learning has a significant positive effect on student motivation in higher education.
- H3: Student motivation has a significant positive effect on student engagement in higher education.
- H4: Student motivation positively and significantly mediates the relationship between e-learning and student engagement in higher education.

LITERATURE REVIEW

E-Learning in Higher Education

Due to the development of digital technologies and double requirements of flexible learning conditions, e-learning turned into an inseparable part of higher education. It allows the students to learn even when they are outside a classroom through accessing and participating in learning activities. Current evidence shows that e-learning increases the accessibility and facilitates the interactive learning process using online platforms and digital tools (Rasheed et al., 2020; Hodges et al., 2020). Nevertheless, its success is subject to technological infrastructure, computer skills and institutional support especially in developing nations where aspects of implementation are still being a major problem.

Student Engagement

Student engagement is used to refer to the extent to which they participate in the learning process and this can be in terms of behavioral, emotional and cognitive aspects. It is regarded as one of the major signs of successful academia and learning. It has been discovered that the students who are engaged have improved levels of participation, persistence, and learning outcomes (Dixson, 2020; Bukhari et al., 2024). Online learning has reduced engagement since there is less interaction between the lecturer and students, and more distraction is likely to occur; it is therefore important to define factors that, when activated, can increase the involvement of the students.

Student Motivation

Student motivation is one of the key issues determining the motivation of students who are willing to learn and the state of their efforts in academic processes. It encompasses intrinsic motivation which is motivated by the personal interest and extrinsic motivation which is motivated by the external rewards. Motivation is an important factor in the context of online learning because students are expected to undertake their learning. Research indicates that students who are motivated tend to be more active and get high learning results (Khan & Hassan, 2020; Hartnett, 2021). Consequently, e-learning environments require motivation to be effective.

E-Learning and Student Engagement

E-learning has broadly been identified as very influential in student engagement in higher learning. Digital learning environments send students chances to interact with course material, be involved in discussions, and work with fellow learners, something that improves overall engagement of students. Research has also found that e-learn systems that are well designed may be effective in enhancing behavioral as well as cognitive engagement in students since it provides interactive content, and learners can obtain learning through various flexible methods (Martin et al., 2020; Choudary et al., 2024). In addition, it has been made possible through the application of multimedia tools, discussion forums and virtual classroom whereby the students are able to actively engage themselves in learning activities thus becoming more involved (Ali & Uddin, 2025; Aurangzeb et al., 2025. But this does not mean that e-learning can be effective in encouraging engagement because it

is dependent on how well the instructional design is, as well as the degree of interaction it offers within the platform. Studies have indicated that in case of a pleasant and user-friendly e-learning environment, academic activities have stronger chances of students staying engaged (Bukhari et al., 2025; Khalil and Ebner, 2021). Therefore, e-learning plays a crucial role in shaping student engagement in higher education.

E-Learning and Student Motivation

The use of E-learning environment affects student motivation greatly because it affords them flexibility and self-direct learning opportunities. Digital platforms enable students to manage their own learning pace and learn via different resources besides enabling interactive content usage and this increases the intrinsic motivation of the student. The past research revealed a positive effect of e-learning systems on the motivation of students, making them more interested and satisfied with the learning process (Fryer et al., 2020; Ishtifaq et al., 2020). Also, the characteristics of instant feedback, gamification, and individual learning paths increase motivation rates among learners. The e-learning systems will be perceived as helpful and easy to use when students get motivated to learn things through these systems. But, absence of interaction, technical problems and insufficient construction of instruction can be detrimental to motivation. Thus, both technological and pedagogical factors play a role in determining the effectiveness of e-learning to help in motivating students.

Student Motivation and Engagement

Studies have indicated that engaged students tend to be more motivated while working on a problem. It has also been found that engaged students will be more motivated to work on a problem. Student motivation is regarded as one of the major predictors of student involvement in educational institutions. The motivated students will be more active, will put in efforts and be committed to their activities of learning (Sain et al., 2026). Motivation is even more paramount in online learning settings where the students have to assume more of the blame on their learning. The studies show that motivation has a direct impact on the degree of engagement among students as motivational factor promotes active involvement in learning activities and perseverance (Hsu et al., 2023; Xie et al., 2020). More motivated students are more likely to have behavioral, emotional and cognitive engagements. On the other hand, lack of motivation can result in lack of engagement and low performance. Motivation among students is therefore, crucial in increasing student engagement and participation in higher learning.

Mediating Role of Student Motivation

The connection between e-learning and student engagement can be further explained with the help of mediating elements student motivation. Although e-learning gives the appropriate tools and environment to be learned, the extent of motivation of students would translate to the extent to which students will make productive use of the tools and the environment. Recent research indicates that motivation is one of the psychological processes, which connects learning conditions to student achievement (Joo et al., 2021; Jaleel et al., 2025). E-learning systems have

the capacity of boosting the motivation of students as it offers them with interactive and flexible learning experiences that concomitantly grow their engagement. This shows that e-learning can have both a direct and an indirect effect of influencing the process of engagement though motivation processes. Moreover, there is empirical evidence to carry out with the concept that motivation partially mediates the connection among e-learning and student engagement, and that it is a serious concern when considering digital learning. Thus, a closer study of the mediating effects of student motivation will give more insights on the role of e-learning in increasing student engagement in higher education.

Theoretical Framework

The present research is rooted in Self-Determination Theory (SDT), which offers an extensive model of cognizing the role of motivation of people in their behavior and commitment to learning processes. Based on SDT, people tend to be more intrinsically motivated in case their fundamental psychological needs on autonomy, competence, and relatedness are met (Ryan and Deci, 2020). Digital platforms in the context of e-learning provide a learning environment, which facilitates these psychological needs. With e- learning systems, students can study at their own pace and study the material taught to them on their own, therefore developing their sense of independence. Strategic material, feedback, and interactive resources not only contribute to the development of competence in students but also encourage the relatedness phenomenon through the communication capabilities, including (but not restricted to) discussion forums and group activities. According to SDT, the intrinsic motivation of the students improves when these psychological needs are met hence resulting in increased motivation in learning activities. In this connection we can take e-learning as an external learning environment which has a way to affect the student engagement in terms of the internal motivational process. The theory thus gives good grounds underpinning the mediating role played by student motivation between e-learning and student engagement. This paper will, therefore, use the Self-Determination Theory to make a theoretically sound explanation of student behavior in higher education, and support the idea that e-learning will contribute to better student engagement directly and indirectly, through student motivation.

Conceptual Framework

The conceptual framework shows the relationship among e-learning, student motivation and student engagement. The e-learning is taken as the independent variable and student engagement is taken as dependent variable and student motivation is taken as the mediating variable. According to the model, e-learning is associated with both direct and indirect impact on student engagement in the form of student motivation. This shows that the e-learning increases motivation among the students, which also results to an increase in the level of engagement.

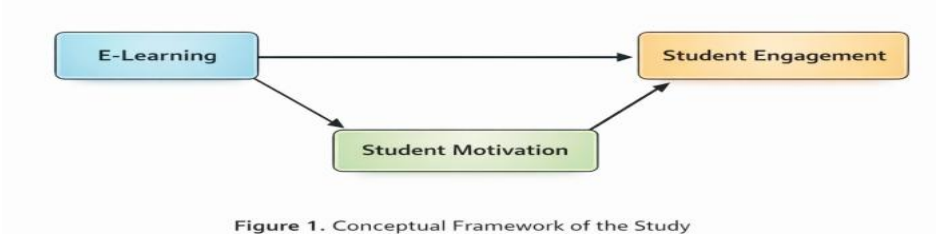

Figure 1. Conceptual Framework of the Study

RESEARCH METHODOLOGY

This research utilized a quantitative research design to test the impact of e-learning on student engagement in higher education moderated by the level of student motivation. The cross-sectional research design was utilized because the respondents were surveyed at one point. The research design is suitable to test theoretically based management relationships between variables and initial tests on causational routes by statistical methods. The study population includes students in Pakistan based in higher learning institutions who have had the experience of using e-learning platforms in their academic undertakings. The research emphasizes undergraduate and postgraduate students to have a holistic approach to higher education. The sample size (N=400) was divided into higher education institutions in various provinces of Pakistan so as to have some geographical coverage. With no elaborate sampling frame and the physical limitation associated with both feasibility and time, a non-probability sampling method, namely convenience sampling, was utilized. This method has been popular in studies of learning among students of university years where it is not sometimes easy to get a list of the entire sample. Moreover, since the main aim of the research is to examine the relationships between constructs and not to conclude the results to the whole population, convenience sampling is deemed to be rather suitable.

A structured questionnaire was used to gather the data via Google Forms. This was effective because the online delivery of the questionnaire also allowed the researcher to access respondents in various provinces and also enhanced the final response rate. The study was voluntary, and respondents were guaranteed of confidentiality and anonymity to reduce the risk of bias in responses. This study employed several items based on the previous validated scales in the literature in measuring the constructs. Everything was rated on the Likert scale of five points (strongly disagree, strongly agree) scale. The e-learning was assessed using six items that were based on the accessibility, usability and effectiveness of online league systems. Six items have been used to measure the student motivation based on intrinsic and extrinsic motivation. Students were assessed in terms of student engagement that has six items corresponding to behaviors, emotions, and cognitive levels of engagement. Partial Least Squares Structural Equation Modeling (PLS-SEM) was used to analyze the data since this approach is appropriate to study the intricate relationships and meditions between latent constructs. Analytical procedure involved the use of two steps. In step one, internal consistency reliability, convergent and discriminant validities were tested by measuring the measurement model. Cronbach alpha and composite reliability were used to test reliability with convergent being tested through factor loading and average variance extracted

(AVE). The Fornell-Larcker criterion was used to test discriminant validity. The second step was the evaluation of the structural model to determine the hypotheses suggested. A bootstrapping process resulted in the assessment of the importance of the path coefficients. Path coefficients, t- values and p-values were analyzed to define the significance of relationships between variables. The coefficient of determination (R^2) was used to determine the explanatory power of the model. In addition, the mediating role of the student motivation was investigated by using the analysis of the indirect effect. In the course of the research, ethical considerations were put into the context. The reason behind the study was explained to the respondents and all the respondents were involved on a voluntary basis. Anonymity of the respondents was guaranteed and so was their confidentiality.

RESULTS

This section presents the empirical findings of the study. An analytical procedure was taken in two steps to assess the proposed model. The measurement model was tested in the first phase to follow the reliability and validity of the constructs. At the second stage, the structural model was tested to explore the stipulated relationships between the variables.

Sample Profile

The demographic data of the respondents was determined to give a summary of the sample. As it has been indicated in Table 1, the sample is made up of male and female respondents, 208 (52%) males and 192 (48%) females respectively. Regarding the age structure, most respondents are aged between 18-22 ages (230; 57.5%), then 23-26 group (130; 32.5%), with a lower proportion being 27 and above group (40; 10%), implying that most of the respondents are young university students. With reference to the education level, majority of respondents are undergraduate students (260; 65%), and 140 (35%) students are post graduate students. Moreover, between the types of institutions, 220 (55%) of the respondents were associated with public universities, and 180 (45%) in private institutions, which guarantees a more balanced structure of students with various academic backgrounds.

Table 1: Demographic Profile of Respondents

Variable	Category	Frequency	Percentage
Gender	Male	208	52%
	Female	192	48%
Age	18–22	230	57.5%
	23–26	130	32.5%
	27 +	40	10%

Variable	Category	Frequency	Percentage
Education Level	Undergraduate	260	65%
	Postgraduate	140	35%
Institution Type	Public	220	55%
	Private	180	45%

As it is demonstrated in Table 1, the sample consists mostly of undergraduate students aged between 18 and 22 years, with a fairly even balance in terms of gender and type of institutions.

Measurement Model Assessment

The model of measurement was evaluated to test the reliability and validity of constructs that were used in the research. As it is customary, the analysis was based on the analysis of internal consistency reliability, indicator reliability, convergent validity, and discriminant validity.

Internal Consistency Reliability and Convergent Validity

Cronbach's alpha and composite reliability (CR) were used to determine internal consistency reliability and factor loadings and average variance extracted (AVE) was used to determine convergent validity. The results in Table 2 show that majority of item loadings surpass this prescribed 0.70 level which means that there will be adequate indication reliability. Moreover, these values are higher than 0.70 which shows that there is adequate internal consistency reliability of the constructs used. In addition, the values of the AVE used in all constructs are above 0.50 which is a satisfactory convergent validity.

Table 2. Measurement Model: Reliability and Convergent Validity

Construct	Item	Loading	Cronbach's Alpha	CR	AVE
E-Learning	EL1	0.712	0.913	0.932	0.695
	EL2	0.847			
	EL3	0.801			
	EL4	0.756			
	EL5	0.829			
	EL6	0.735			

Construct	Item	Loading	Cronbach's Alpha	CR	AVE
Student Motivation	SM1	0.824	0.918	0.936	0.710
	SM2	0.751			
	SM3	0.767			
	SM4	0.832			
	SM5	0.844			
	SM6	0.747			
Student Engagement	SE1	0.836	0.921	0.938	0.717
	SE2	0.762			
	SE3	0.779			
	SE4	0.841			
	SE5	0.753			
	SE6	0.819			

Table 2 uses the three constructs demonstrates that all the constructs meet the suggested criteria of reliability and convergent validity. The results have shown that the measurement items are sufficient to cover the respective latent constructs.

Discriminant Validity

The Fornell-Larcker criterion was used to measure or determine the discriminant validity. As in Table 3, AVE square root of all the constructs is larger than the correlations to the remaining constructs. This will ensure that each of the constructs is empirically different to the other and discriminant validity achieved.

Table 3. Discriminant Validity (Fornell–Larcker Criterion)

Construct	E-Learning	Student Motivation	Student Engagement
E-Learning	0.834		
Student Motivation	0.611	0.843	

Construct	E-Learning	Student Motivation	Student Engagement
Student Engagement	0.648	0.682	0.847

The findings in Table 3 support the idea that the measurement model exhibits good discriminant validity, as the values at the diagonal are large compared to those shown in the inter-construct correlation. In general, the measurement model under consideration has sufficient ratio reliability and validity. The findings show that all the constructs identify the necessary level of internal consistency reliability, convergent and discriminant validity. Thus, the measurement model is found to be satisfactory and the analysis may continue up to the evaluation of the structural model and testing of the hypothesis.

Structural Model

Structural model was tested after reliability and validity of the measurement model were established to test the hypothesized relationships between the constructs. The evaluation of the structural model was done by evaluating the path coefficients and their level of significance and explanatory power of the model.

Coefficient of Determination (R^2)

The coefficient of determination (R^2) was used to determine the explanatory power of the model. The findings show that e-learning accounts to 37% of the variance in student motivation ($R^2 = 0.37$), and the combination of both e-learning and student motivation demonstrates the 52% of the variance in student engagement ($R^2 = 0.52$). This shows that there is moderate level of explanatory power.

Table 4. Structural Model Results

Hypothesis	Path	β	t-value	p-value	Decision
H1	E-Learning → Student Engagement	0.29	3.45	< 0.001	Supported
H2	E-Learning → Student Motivation	0.61	8.12	< 0.001	Supported
H3	Student Motivation → Student Engagement	0.48	6.27	< 0.001	Supported

Table 4 shows the findings of the hypothesis testing. The results have shown that e-learning has a greater positive impact on student engagement ($\beta = 0.29$, $p < 0.001$), meaning that it supports H1. Equally, e-learning positively influences the student motivation ($\beta = 0.61$, $p < 0.001$) which proving H2. Moreover, student engagement is affected positively by student motivation ($\beta = 0.48$, $p < 0.001$), which is in the support of H3.

Mediation Analysis

The effect of student motivation in the relationship between e-learning and student

engagement was investigated by considering the indirect effect.

Table 5. Mediation Analysis Results

Hypothesis	Indirect Path	β	t-value	p-value	Decision
H4	E-Learning → Motivation → Engagement	0.29	4.11	< 0.001	Supported

The findings also reveal that the indirect effect of e-learning on student engagement via student motivation is also positive and it is significant ($\beta = 0.29$, $p < 0.001$). This result confirms that the relationship between e-learning and student engagement is mediated by student motivation, thus supporting H4. In addition, the fact that the direct impact of e-learning on the student engagement stays important, even in the case when one considers the additive of the mediator, suggests that the process of mediation should be discussed as a partial mediation. In general, the outcomes of the structural model reveal that e-learning plays an important role in student motivation as well as student engagement. Moreover, motivation among the students is an important mediating factor making student engage more in e-learning environments.

DISCUSSION

In this study, the researcher has analyzed how e-learning effects student engagement in a higher learning institution and the mediator is student motivation. All the results have a solid empirical basis of the given relationships, and they agree with the current literature about the sphere of digital learning.

The findings show that e-learning produces a strong positive impact on the engagement of students. This result implies that online learning conditions promote the involvement, engagement, and participation of the students in learning processes. As the latest research has pointed out, e-learning solutions provide a better learning experience with flexible access to learning materials and interactive resources (Bond et al., 2020; Martin and Bolliger, 2021). On the same note, studies that were carried out online during and after the COVID-19 have revealed that technological mediated learning contributes positively to the behavioral and cognitive engagement of students (Dhawan, 2020; Rasheed et al., 2020). These results substantiate the thesis that an appropriate e-learning system can promote the active involvement of students in an academic institution. Moreover, the study established that e-learning produces a positive impact on student motivation that is significant. This means that e-learning environments are able to increase the willingness to learn among the students through offering freedom of choice, access, and interactive learning experiences. According to the recent research, digital platforms, multimedia content, and self-paced learning have a positive impact on motivation among the students (Almaiah et al., 2020; Chung et al., 2020). Also, it has been determined that the motivation of students grows when they find e-learning systems practical and convenient (Agyei and Voogt, 2021). These results indicate that e-learning is important in the stimulation of intrinsic and extrinsic motivation.

Besides this, the findings show that the student motivation is a significant positive factor on student engagement. This outcome points to the fact that motivated students would be willing to engage in learning activities more effectively and put effort into them. This relationship can be explained by the recent literature, where motivation is mentioned as a determining factor to engage in an online learning environment (Han and Wang, 2021; Kim and Frick, 2021). The students who are more motivated would have a higher degree of persistence, participation, and thinking involvement, thereby making them more engaged. More importantly, findings affirm that e-learning has a mediating effect on student engagement through student motivation. This discovery gives us a clue on the working mechanism of e-learning in terms of triggering the results of the students. In particular, e-learning elevates the level of motivation of students, which subsequently causes greater engagement. The intermediating impact of motivational variables in the technology-driven learning settings was also noted in recent research (Zhang et al., 2021; Alraimi et al., 2022). The intervention of the partial mediation indicates that the e-learning does not only have a direct impact on the engagement but as well an indirect impact as a result of the motivational mechanism. Contextually, the research forms part of the growing knowledge on e-learning in developing nations especially Pakistan. The recent studies point to the fact that the efficiency of e-learning in this scenario does not only depend on the technological infrastructure but also on the motivation and the engagement [of students] (Adnan et al., 2020; Ali et al., 2021). The results of this research help to support the fact that the development of e-learning systems that are learner-centered should be designed to actively foster motivation and engagement.

CONCLUSION

The purpose of this research involved examining how e-learning influences student engagement in higher education, and specifically how the student motivation mediated this impact. The findings clearly show that e-learning has a great contribution in student motivation in addition to student engagement. The findings demonstrate the significance of online learning environments in designing the academic life of students. The research also establishes motivation among students as one of the primary determinants of student engagement, which means that students who are motivated tend to be more willing to engage in learning endeavors and work hard. More importantly, the findings prove the statement that student motivation plays an important role as a mediator between e-learning and student engagement. This implies that, the usefulness of e-learning is not limited to technical capabilities but also the capability to evoke and maintain student motivation. In general, the research finds that e-learning has the potential of being an effective instrument to enhance student engagement in tertiary education, specifically in the case, where it is modeled to facilitate motivational components of learning. The results add to a better insight into the interaction of technological and psychological factors that affect the behavior of students, particularly with reference

to the higher education in Pakistan.

Recommendations

- Educational institutions ought to create interactive and user-friendly e learning platforms that might increase student participation and engagement.
- Universities must introduce the motivational factors like personalized learning, feedback in time and interesting contents to gain the interest of students toward learning.
- E-learning systems must be structured in such a way that they encourage active learning by use of collaborative tools, discussions, and real-time interaction.
- The policy makers ought to invest in development of digital infrastructure and offer trainings programs to facilitate effective adoption of e-learning.
- The institutions ought to consider improving the digital literacy of students so that they can utilize the platforms of e-learning positively.

Future Research Directions

The proposed future study can be based on the utilization of the probability sampling methods in enhancing the generalizability of the results. The longitudinal designs of research would be useful in the analysis of the causal relationship in the long term. More variables might be studied in the future with the help of self-efficacy, digital literacy, and learning satisfaction as they can provide more profound understanding of the student behavior within the e-learning context. Comparative study of various regions or countries can also be useful in the determination of the role of the contextual and cultural factors in determining the effectiveness of e-learning.

REFERENCES

Adnan, M., & Anwar, K. (2020). Online learning amid the COVID-19 pandemic: Students' perspectives. *Journal of Pedagogical Sociology and Psychology, 2*(1), 45–51.

Agyei, D. D., & Voogt, J. (2021). Exploring the potential of the flipped classroom approach in enhancing student motivation and engagement. *Educational Technology Research and Development, 69*, 1–19. https://doi.org/10.1007/s11423-021-09985-4

Ali, R. A., & Uddin, S. S. (2025). Rise of CRINK: Reshaping Alliances Since 9/11. Pakistan Journal of Social Science Review, 4(4), 246-269.

Ali, W., Mirza, M. S., & Iqbal, A. (2021). Perceptions of students regarding e-learning in Pakistan. *Education and Information Technologies, 26*, 301–318. https://doi.org/10.1007/s10639-020-10392-0

Almaiah, M. A., Al-Khasawneh, A., & Althunibat, A. (2020). Exploring the critical challenges and factors influencing the e-learning system usage during COVID-19 pandemic. *Education and Information Technologies, 25*, 5261–5280. https://doi.org/10.1007/s10639-020-10219-y

Alraimi, K. M., Zo, H., & Ciganek, A. P. (2015). Understanding the MOOCs continuance: The role of openness and reputation. *Computers & Education,*

80, 28–38. https://doi.org/10.1016/j.compedu.2014.08.006

Aurangzeb, M., Uddin, S. S., Aziz, Z., & Bibi, S. (2025). Great Power Rivalry and the Shifting World Order Since 2001: A Realist Study of US-China Competition. Journal of Political Stability Archive, 3(3), 1601-1611.

Bond, M., Bedenlier, S., Marín, V. I., & Händel, M. (2020). Emergency remote teaching in higher education: Mapping the first global online semester. *International Journal of Educational Technology in Higher Education, 17*(1), 1–24. https://doi.org/10.1186/s41239-020-00282-x

Bukhari, S. R. H., Irshad, A. U. R. B., & Khan, E. (2025). Honey trap espionage in the age of digital warfare: Strategic lessons from India's DRDO scandal and implications for Pakistan's national security. Qlantic Journal of Social Sciences and Humanities, 6(3), 1-13.

Bukhari, S. R. H., Irshad, A. U. R. B., Khan, A. U., Ali, M., Noreen, S., Khan, S. A., & Mumtaz, A. (2024). Political Criminology: Unmasking Power Through The Study Of Justice Manipulation And Authority Exploitation. Migration Letters, 21(S13), 1008-1035.

Choudary, S. S., Khan, M. L., & Atta, N. (2024). Emotional distress, communication patterns and relationship dissatisfaction among married couples. Research Journal for Societal Issues, 6(3), 01-22.

Chung, E., Subramaniam, G., & Dass, L. C. (2020). Online learning readiness among university students in Malaysia amidst COVID-19. *Asian Journal of University Education, 16*(2), 45–58. https://doi.org/10.24191/ajue.v16i2.10294

Dhawan, S. (2020). Online learning: A panacea in the time of COVID-19 crisis. *Journal of Educational Technology Systems, 49*(1), 5–22. https://doi.org/10.1177/0047239520934018

Dixson, M. D. (2020). Creating effective student engagement in online courses: What do students find engaging? *Journal of the Scholarship of Teaching and Learning, 20*(2), 10–26. https://doi.org/10.14434/josotl.v20i2.27771

Fryer, L. K., Bovee, H. N., & Nakao, K. (2020). E-learning motivation and engagement. *Computers & Education, 150*, 103842. https://doi.org/10.1016/j.compedu.2020.103842

Han, J., & Wang, Y. (2021). Investigating the impact of motivation on engagement in online learning environments. *Computers & Education, 168*, 104196. https://doi.org/10.1016/j.compedu.2021.104196

Hartnett, M. (2021). The importance of motivation in online learning. *Educational Technology Research and Development, 69*, 65–87. https://doi.org/10.1007/s11423-020-09853-x

Hodges, C., Moore, S., Lockee, B., Trust, T., & Bond, A. (2020). The difference between emergency remote teaching and online learning. *Educause Review, 27*, 1–12.

Hsu, W. K., Wei, Y. C., Lee, C. H., Hoang, L. V., & Huynh, N. T. (2023, October). A risk assessment model of work safety in container dry ports. In Proceedings of

the Institution of Civil Engineers-Maritime Engineering (Vol. 176, No. 4, pp. 193-205). Emerald Publishing Limited.

Ishtifaq, A., Qureshi, S., Farooq, S., Kashoo, Z. A., Malik, M. Z., Alam, M. R., ... & Shah, S. M. (2020). Genotyping and antibiotic resistance patterns of Campylobacter fetus subsp. venerealis from cattle farms in India. Letters in Applied Microbiology, 71(6), 627-636.

Jaleel, A., Rabbani, S., & Sarmad, M. (2025). Unlocking the effects of joyous exploration and deprivation sensitivity on employees' job crafting behavior: a moderating and mediating mechanism. Career Development International, 30(3), 326-344.

Joo, Y. J., Lim, K. Y., & Kim, J. (2021). Structural relationships among self-regulation, motivation, and engagement in online learning. *Educational Technology Research and Development, 69*, 1805–1825. https://doi.org/10.1007/s11423-021-09986-3

Khalil, H., & Ebner, M. (2021). Learning analytics: Principles and constraints. *Computers in Human Behavior, 122*, 106857. https://doi.org/10.1016/j.chb.2021.106857

Khan, M. L., & Hassan, N. U. (2020). Parental authority, introversion, self-esteem and religious coping factors as predictors of social anxiety among adolescents. Pakistan Social Sciences Review, 4(3), 1036-1044.

Kim, K. J., & Frick, T. W. (2021). Changes in student motivation during online learning. *Educational Technology Research and Development, 69*, 1121–1145. https://doi.org/10.1007/s11423-021-09971-w

Martin, F., & Bolliger, D. U. (2021). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment. *Online Learning Journal, 25*(1), 205–222. https://doi.org/10.24059/olj.v25i1.2292

Martin, F., Sun, T., & Westine, C. D. (2020). A systematic review of research on online teaching and learning. *Computers & Education, 159*, 104009. https://doi.org/10.1016/j.compedu.2020.104009

Rasheed, R. A., Kamsin, A., & Abdullah, N. A. (2020). Challenges in the online component of blended learning: A systematic review. *Computers & Education, 144*, 103701. https://doi.org/10.1016/j.compedu.2019.103701

Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective. *Contemporary Educational Psychology, 61*, 101860. https://doi.org/10.1016/j.cedpsych.2020.101860

Sain, Z. H., Kanwal, T., Syed, H., & Khan, Z. (2026). Effect of Collaborative Learning on the Academic Achievements of Post-Graduate Students. Policy Journal of Social Science Review, 4(2), 334-340.

Xie, K., Heddy, B. C., & Vongkulluksn, V. W. (2020). Engagement in online learning: A study of motivation and performance. *Educational Psychology Review, 32*,

345–365.
https://doi.org/10.1007/s10648-020-09524-7
Zhang, X., Dang, Y., & Chen, Y. (2021). Understanding student motivation and engagement in online learning environments. *Educational Technology & Society, 24*(2), 138–150.