Pakistan Journal of Psychology, December 2023, 54, 2, 17-34

E-LEARNING SATISFACTION, E-LEARNING OUTCOMES AND MENTAL HEALTH IN UNIVERSITY STUDENTS DURING COVID-19 PANDEMIC

Shazia Aslam*, Kiran Akbar Khan,
Shumaila Abid, Amna Khawar & Umme Rubab Kazmi
Department of Applied Psychology
Lahore College for Women University, Lahore-Pakistan

ABSTRACT

The purpose of the present was to ascertain interrelationships between e-learning satisfaction, e-learning outcomes and mental health in university students during COVID-19 pandemic. A sample of university students (N=240) with equal representation of gender and age range of 18-21 years was recruited through purposive sampling technique from public and private sector universities of Lahore. In order to measure study variables, self-constructed Demographic Information Sheet, Students Satisfaction with Online Learning Scale (Dziuban et al., 2007), E- Learning Outcomes Scale (Emo & Ashill, 2016) and Positive Mental Health Scale (Lukat et al.,2016) were used. Analyses reveals e-learning satisfaction and e-leaning outcomes as significant predictors of mental health whereas a predictive association between e-learning outcomes and mental health is also evident. Further, e-learning outcomes significantly mediated the association of e-learning satisfaction with mental health in university students. The results have important implications for developmental and educational psychologists.

Keywords: *E-Learning, Learning Outcomes, COVID-19, Pandemic, Mental Health*

* Correspondence Address: Shazia Aslam, PhD; Department of Applied Psychology, Lahore College for Women University, Lahore-Pakistan.
Email: shaziaaslam2938@gmail.com

INTRODUCTION

The COVID-19 pandemic has resulted in notable disruptions and challenges for individuals worldwide, affecting multiple facets of their lives like as employment, education, and safety (Chaturvedi et al., 2021). The pandemic's exceptionally intense nature seriously disrupted educational institutions (Tadesse & Muluye, 2020). The primary obstacles for educational institutions was that it complicated face-to-face learning and led to closure of school because the primary focus of educational institutions was teacher and student safety. To prevent the pandemic danger, the students were urged to continue their social isolation and stay at home (Owusu-Forddjour et al., 2020). Even though educational institutions were dealing with these problems, they were unable to stop all of the teaching and learning activities, therefore they made the decision to shift the educational process to e-learning (Fawaz & Samaha, 2021).

E-learning is known as the utilization of digital instruments for the process of learning, generally means of delivering all or few parts of a course digitally either in educational institutions, business trainings or in form of distance learning courses. The online learning is the utilization of internet and other fundamental technologies to develop the materials for the educational purpose, program's management and for instructional delivery (Fry, 2001). E-learning is generally categorized into asynchronous e-learning and synchronous e-learning (Hrastinski, 2008). However, other difficulties also arose when educational activities were moved to online learning, such as students' lack of preparation for the abrupt shift to a very demanding online learning environment. Various platforms i.e. Skype, Zoom, Google classroom, Google meet and Microsoft team were provided to the students that have created confusions for both the academic staff and students. This sudden digitalization was not easy to adopt for both students and teachers. At this point, it was difficult to judge whether the advantages of online classes outweigh the drawbacks, specifically for those who are involved in practical or clinical activities (Fawaz & Samaha, 2021). In order for effective e-learning the organizations, instructors and institutions must consider their advantages and disadvantages (Hrastinski, 2008).

Students satisfaction with e-learning refers to the extent of perceived learner satisfaction with e-learning environments overall (Sun et al., 2008). The facilitated model of learning posits that learning occurs through an educator who can make the good atmosphere and can maintain it. Good atmosphere is necessary for the development of new ideas and external threats are lessened. The primary

components of e-learning satisfaction are an enhanced learning environment, clearly stated rules of involvement, instructor dedication, less uncertainty, an engaging setting, and less ambivalence over the course's usefulness (Dziuban et al., 2007). Eom et al. (2006) postulated that eight factors have an impact on students' satisfaction with e-learning: instructor activities, instructor-student interaction, student self-regulation, student motivation and course structure.

Students' satisfaction with e-learning outcomes includes both their overall performance in their courses that use e-learning systems and the immediate outcome of a satisfactory learning experience (Sun et al., 2008). Satisfaction is a crucial factor while discussing higher education. E-Learning satisfaction is regarded as an indicator of e-learning outcomes (Eom et al., 2006; My et al., 2022). Yunusa and Umar (2021) classified the factors of student satisfaction with e-learning outcomes under four domains: (a) environmental factors (e.g., contents of course, structure of course); (b) communication factors (e.g., interaction, quality of information); (c) situational factors (motivation and self-efficacy); (d) organizational factors (service quality). The student's outcomes of learning depend on various elements i.e. (i) learning management system (LMS) (ii) prior experiences (iii) styles of learning (iv) cognition (v) learning engagement and meta cognition. Learners of present times require more channels for collaboration and which the online learning environments can give with the support of different models of instruction that are available at all times and from any location (Janson et al., 2014).

Mental health is referred to as a person's whole state of emotional, psychological, and social well-being (Lukat et al., 2016). The World Health Organization (2014) defines mental health as a state of well-being in which every individual can recognize their own potential, manage everyday stressors, work effectively and efficiently, and be able to contribute to their community. Mental health is also posited as a person's condition that include the psychological, emotional as well as social well-being. It influences how the people feel, think and perform that they may manage their anxiety and stress (Galderisi, 2015).

Given the COVID-19 situation, a number of entities, including educators and teachers, may have been distressed and under stress as a result of changes in their personal, professional, and social lives, such as domestic abuse, unemployment, being stranded at home, losing their job, breaking up with their families, and losing loved ones (Sahu, 2020). These mental pressures may result in a variety of behaviors and emotions that have an impact on their learning

processes, academic success, and general well-being both directly and indirectly. These could include getting too little or too much sleep, missing out on daily activities, feeling anxious about the state of affairs, having poor energy, and having an uncertain and unknown future (Wang et al., 2020).

Several researches have documented the the negative consequences of e-learning for students mental health during COVID-19 pandemic (Alibudbud, 2021; Alyoubi et al., 2021; Azmi et al. 2022; Cao et al., 2020; Carrion et al., 2023; Center, 2020; Chaturvedi et al., 2021; Chu & Li, 2022; Cofini et al., 2022; Fawaz & Samaha, 2021; Khawar et al., 2021; Mahamid et al., 2022; Mehareen et al., 2021; Rutkowsak et al., 2022; Sahu, 2020). Likewise, the link between satisfaction with e-learning and e-learning outcomes is also demonstrated by a number of studies prior to (Eom & Ashill, 2006) and during COVID-19 (Khawar et al., 2021; Li et al., 2023; Owusu-Fordjour, 2020; Petrov et al., 2022).

To sum up, the COVID-19 pandemic forced the governments around the world to shut down all the educational institutions to control the spread of this deadly virus, and as a result it directly impacted students, educators, and institutions. The classes were abruptly shifted from physical classroom to virtual modes causing an intense disruption among students. The students' main worries were stress related to their education and unfamiliarity with the online system (Poalses & Bezuidenhout, 2018). A review of Western literature suggest that Students' satisfaction with e-learning significantly influences students satisfaction with online-learning outcomes and is linked to their mental health as well. There is dearth of such studies in Pakistani context particularly in a sample of university students. As we belong to the developing country and the financial conditions of all students are not strong, so the accessibility towards the equipment of e-learning and the non-familiarity with their uses was also another challenge for the students. Hence, this study was an attempt to examine the interrelationship between e-learning, satisfaction, e-learning outcomes and mental health in university students during the COVID-19 pandemic. In addition, this study also intended to examine the mediating role of e-learning outcomes between relationship of e-learining satisfaction and mental health in university students during COVID-19 pandemic.

METHOD

Participants

The cross-sectional research design was employed. The sample comprised of university students (*N*=240) recruited from different public (60 girls & 60 boys) and private universities (60 girls & 60 boys) of Lahore, Pakistan. The following inclusion and exclusion criteria were applied while recruiting particpants using the purposive sampling technique: (a) Students who were enrolled in e-Learning academic programs were included; (b) Only students of age range 18 -21 years were included in the study; (c) Students who did not have personal computers or Wi-Fi were not included in the study; (d) Students who have any physical and mental disability were not the part of this study.

Measures

Demographic Information Sheet

A self-constructed demographic information sheet was employed to obatin information such as age, gender, birth order, university name, family system, family income, residential location, if thet have your personal computer, personal wi-fi, type of software used in e-learning, number of gadgets they had at home, number of family family members availing e-learning at the same time, duration of experiencing e-learning.

Students Satisfaction With Online-Learning Scale

E-learning Satisfaction was evaluated with Students' Satisfaction with 16-item Online Learning Scale by Dziuban et al. (2007). This items on the scale are rated on a 5-point Likert scale, with *1* representing *strongly disagree* and *5* representing *strongly agree*. Greater satisfaction with e-learning is indicated by higher scores on the scale. The author reported excellent internal consistency (α = .96). The Cronbach alpha of .87 obtained in the present study also indicates good internal consistency.

E-Learning Outcomes Scale

E- learning utcomes was evaluated by e-Learning Outcomes Satisfaction Scale developed by Eom and Ashill (2016). This scale consisted of twenty-two

items with six subscales i.e. interaction, students motivation, course structure, instructor facilitation, students' perceived learning and students' satisfaction. A 5-point Likert scale, with *1* denoting *strongly disagree* and *5* denoting *strongly agree* is used to record responses. Greater satisfaction with the outcomes of e-learning is indicated by higher scores on the scale. In the present study, the Cronbach alpha value is obtained to be .91 which indicates satisfactory international consistency.

Positive Mental Health Scale

Positive Mental Health Scale is developed by Lukat et al. (2016). Items of the scale explain the feelings and experiences of mental health. The scale has nine items responded on a 4-point Likert scale ranging from *(1) not true* to *(4) true*. Higher scores on the scale indicated higher mental health. The author reported satisfactory internal reliability for the scale (α =.81). The Cronbach alpha of .85 obtained in the present study also indicates good internal consistency.

Procedure

The research followed the standard approval procedure of Ethical Board of Lahore College for Women University, Lahore. Formal permission from authors was taken to use the scales in the study. Permission from departments was also sought. Researchers obtained authority letter from head of the Applied Psychology department, LCWU to collect data from different public and private universities. Permission from the head of the respective universities was also obtained. Verbal briefing was given to the participants about the study and written informed consent was taken. Screening was done for recruitment based on inclusion and exclusion criteria of the study. The data collection was planned according to availability and facilitative schedule of the participants. The demographic information sheet and English versions of all three research measures (i.e. Satisfaction with E-Learning Scale, E-Learning Ouctome Scale and Positive Mental Health) were administered. All ethical requirements were adhered henceforth. All the scales were administered in face-to-face manner and average time consumed in filling all scales was only 25 minutes.

Statistical Analysis

All the statitucal analyses was performed using SPSPP version 23.00. The correlation analyses was employed to examine the intercorrelation among study vraibles. Linear regression analyses were emlpyed to test the predictive association

of e-learning satisfaction and learning outcomes with mental health and also to examine the predictive association between e-learning satisfaction and learning outcomes. Further, Process Macro was employed to test the meditational role of e-learning outcomes between e-learning satisfaction and mental health. Descriptive statistics was also used.

RESULTS

Table 1
Psychometric Properties of the Scale and Subscales

Scales	*M*	*SD*	*Range*	α
E-Learning Satisfaction	3.12	3.78	16-110	.87
E-Learning Outcomes	3.21	16.4	35-135	.91
Mental Health	3.23	5.36	15.37	.85

Table 2
Intercorrelations between E-Learning, Satisfaction, E-Learning Outcomes and Mental Health in University Students (N=240)

Variables	1	2	3
1. E-Learning Satisfaction	1.00		
2. E-Learning Outcomes	.70*	1.00	
3. Mental Health	.33*	.42*	1.00

*p <.05

Table 3
Descriptive Statistics forParticipants' Demographic Characteristics (N=240)

Variables	*f*	%
Gender		
Male	120	50.0
Female	120	50.0
Education		
14-years	80	33.3
15-years	68	28.3
16-years	92	37.9
University		
Public	120	50.0
Private	120	50.0
Family System		
Joint	101	43.0
Nucealr	139	57.0
Monthly Income		
40-60k	72	30.0
60-80k	58	24.0
80-100k	110	45.0
Family Location		
Urban	163	67.9
Rural	31	12.9
Town	34	14.2
Others	12	5.0
Software used for E-Learning		
Zoom	161	23.0
Google Classroom	62	77.0
Microsoft Team	02	0.8
WhatsApp	12	5.0
Others	03	1.3

Table 3
Continued

Variables	*f*	%
No. of Gadgets		
1	50	20.8
2	86	35.8
3	39	16.3
4	65	27.1
Duration of E-Learning		
3 months	39	16.3
6 months	76	31.7
12 months	102	42.5
24 months	23	9.6
	M	*SD*
Age	20.3	.79

Table 4
Linear Regression Analysis with E-Learning Satisfaction as Predictor of Mental Health in University Students

Predictor	*B*	*SE*	*β*	R^2	*F*	*Sig.*
Constant	22.63	1.24				
E-Learning Satisfaction	.13	.024	.33	.11	29.73	.00*

*$p<.05$

Table 5
Linear Regression Analysis with E-Learning Outcomes as Predictor of Mental Health in University Students

Predictor	*B*	*SE*	*β*	R^2	*F*	*Sig.*
Constant	19.51	1.39				
E-Learning Outcomes	.14	.02	.42	.18	50.45	00*

*$p<.05$

Table 6
Linear Regression Analysis with E-Learning Satisfaction as Predictor of E-Learning Outcomes in University Students

Predictor	*B*	*SE*	*β*	R^2	*F*	*Sig.*
Constant	23.12	2.44				
E-Learning Satisfaction	.95	.05	.79	.63	404.43	000

*$p<.05$

Table 7
Model Analyses for E-Learning Outcomes as Mediator in the relationship between E-Learning Satisfaction and Mental Health

			95% CI			
Model	*B*	*SE*	*LL*	*UL*	*t*	*p*
E-Learning Satisfaction	.002	.04	-.073	.076	.040	.97
E-Leaning Outcomes	.135	.03	.073	.198	4.28	.00*

*p< .05

Table 8
Indirect Effects of E-Learning Outcomes on Mental Health

			95% CI	
Model	*Effects*	*SE*	*LL*	*UL*
E-Leaning Outcomes	.128	.03	.075	.190

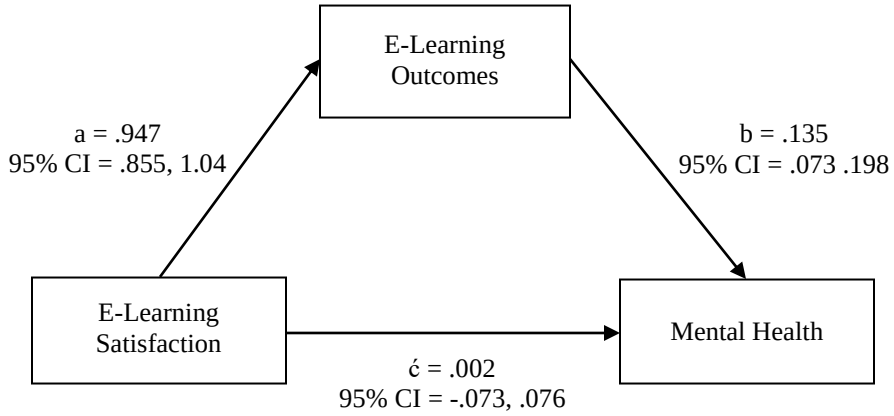

Figure 1. Mediation model of Learning outcomes (M) in the relationship between E-Learning Satisfaction (X) and Mental Health of University Students

DISCUSSION

Drawing upon existing literature pertaining to COVID-19 pandemic posed challenges to educational institutions and system which has impacted students' mental health (Chu & Li, 2022; Mahamid et al., 2022), the present study examined the interrelationship between e-learning satisfaction, e-learning outcomes and mental health in university students during COVID-19 pandemic. The obtained trends are as followed:

Pertaining to e-learning satisfaction and mental health, the results demonstrate a significant positive association and suggest e-learning satisfaction a significant predictor of mental health (Table 4). Further, concerning the link between e-learning satisfaction and mental health, the results reveal a significant positive association and suggest e-learning satisfaction a significant predictor of e-learning outcomes (Table 5). Moreover, a significant positive association between e-learning satisfaction and e-learning outcomes is also revealed suggesting e-learning satisfaction a precursor to e-learning outcome (Table 6).

These results of the current study are congruent with the previous literature which support the association of e-learning satisfaction and e-learning outcomes with mental health (Alibudbud, 2021; Azmi et al., 2022; Chaturvedi et al., 2021; Lister et al., 2023; Mahamid et al., 2022). It has been seen in a number of studies that when learning is switched from traditional to online, students felt comfortable and realxed. Their somatic symptoms and symptoms of stress, anxiety and depression marginally decreased and and their overall mental health is improved (Bolatov et al., 2021; Chu & Li, 2022; Idris et al., 2021; Mortagy et al., 2020). A greater positive influence was evidenced in medical students (Bolatov et al., 2021; Chu & Li, 2022; Idris et al., 2021). It may be explained by the fact that they didn't have to be ready by following strict timing, travelling is avoided, strict disciple of institutions is avoided. They become independent and attend classes in relaxed mood.

Nonetheless, existing studies also suggest another aspect in this context that is inconsistent to the findings of present study. The same shift of the systems of face-to-face learning toward the e-learning system have been seent to negatively influenced students' mental health and wellness (Centers, 2020; Chang et al., 2021; Hude et al., 2022; Rutkowska et al., 2022). The underlying reason can be lower socioeconomic status of the students and it can result in mental distress due to the non-availability of the gadgets and internet connections.

Furthermore, the results with regard to meditational role of e-learning ouctomes reveal e-learning outcome fully mediated the relationship between e-learning satisfaction and mental health (Table 7 & 8, Figure 1). This implies that e-learning satisfaction did not directly influence mental health of the university students but it exerts its influence through the learning outcomes. The current study's findings support those of the earlier investigation (Cao et al., 2020; Carrion et al., 2023). This result can be explained by the fact that students who learn online may feel less driven to succeed, are less able to manage their time, and are less motivated to study. Thus, students maintain mental health if they receive positive learning outcomes from e-learning (Bolatov et al., 2021).

In conclusion, the findings of the present study support the interrelationship between e-learning satisfaction, e-learning outcomes, and mental health. The results additionally demonstrate that the e-learning satisfaction is linked to mental health of university students through e-learning outcomes. These findings are useful for teachers, institutional management, parents, educators, universities, and students to comprehend the influence of the online learning environment and how they affect students' current education. The study's conclusions could be helpful for the pertinent stakeholders in forecasting healthier programs for the students of different institutions. This study will likewise have implications in educational and health psychology fields, as findings may be beneficial for understanding the learning outcomes that students at universities have experienced as a results of e-learning during COVID-19.

This study has certain limitations which the future researches are suggested to keep in view in order to attain more valid and authentic findings of the topic in hand. The participants of current study were drawn merely from one city of Pakistan i.e., Lahore. Sample should be recruited from different cities of Pakistan. The present research was conducted on university students, by keeping the same variables research can also be conducted on college and school students. Limited time and revisit the institutions due to the absence of students was also a problem itself, in this concern. Time should be expanded for the study.

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