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2022

Online at <https://mpra.ub.uni-muenchen.de/112330/>
MPRA Paper No. 112330, posted 11 Mar 2022 11:12 UTC

Factors Affecting Post Acceptance of E-Learning Platform in times of COVID-19: An Evidence from an Emerging Economy

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Abstract

COVID 19- has changed the landscape and the method to conduct daily tasks since past two years. Considering the restrictions and lockdowns enforced by the government, educational institutes were greatly impacted. It became challenging for the teachers to complete the courses on required schedule and to teach the students. The students suffered due to constant lockdown and the restriction enforced by the government regarding the use of physical spaces. Amidst such time adopting e-learning platform became essential as it can help in completing the curriculum on time and to cover the incurred loss. This study was aimed at analyzing the factors that is PU, PEOU, SE, PE, CM, and PDR and its impact on the adoption of e-learning platform by students and teachers.

A survey was conducted for collection of data for this study. A total of 250 participants constituted the sample size for this research work. The results were analyzed in PLS-SEM software. The results concluded that (*PE*), perceived usefulness, perceived daily routine and critical mass had positive relation and significant relationship on the adoption of e-learning platform. Whereas self-efficacy and (*PEU*) have positive and insignificant relationship on adoption of e-learning platform.

Key words: Perceived Enjoyment (*PE*), Perceived Usefulness (*PU*), Perceived daily routine, Critical mass, Self-efficacy, *Perceived Ease of Use (PEU)*

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

COVID-19 pandemic has changed the method of working of many industries. Educational sector has been most affected by this pandemic. The higher education institution has faced many challenges due to this pandemic. Even after the vaccination drives, higher education sector continues to thrive and it has been struggling to adapt to the requirements of e-learning. Post-COVID situation requires a change in the traditional teaching and learning methods. Amidst pandemic, most of the educational institutions switched to the virtual classrooms to continue to provide the students with the education and to save them with the academic losses. However, this shift was relatively new for the educational institutes and brought with it a number of challenges (Al-Marroof et al, 2021).

The use of the internet and computer-based devices have become essential components due to the increased use of e-learning platforms. E-learning platforms can be defined as system of learning which is based on formalized teaching while using electronic resources (Alkhalil et al, 2021). However, it has been observed that perceived daily routine with respect to using technology makes using e-learning platforms easier. The perceived daily routine can be defined as the extent to which technology becomes part of normal use in the daily routine of the user. As per observation, students and teachers who use computer-related technology as a daily part of their routine find it easier to adapt to e-learning technology.

Apart from perceived daily routine Self-efficacy is also considered a significant element towards the use of e-learning technology. Self-efficacy can be defined as the perception of the user regarding the ability to perform and to properly finish a task. Perceived efficacy serves as an antecedent of online learning. Since self-efficacy means that people are efficient in using e-learning platforms, they can make better use of e-learning platforms (Titus et al, 2020).

(PEU) is another factor that plays a significant role in adopting e-learning platforms. *(PEU)* refers to the extent to which a person holds a belief that using certain technology would be hassle-free. *(PEU)* is linked with a positive attitude with respect to the adoption of e-learning platforms. *(PEU)* influences students' purpose to use e-learning platforms indirectly through *(PE)* and *(PU)* (Titus et al, 2020).

Another factor which impacts the adoption of e-learning platform includes perceived usefulness. It can be explained as the belief of a person regarding use of a particular system that can improve job performance. Since the technology has become an integral part daily routine, most of teachers and students considers it more useful and facilitating aid in learning process. (Kulkarni, and More. et al, 2020).

Another factor that impacts the use of e-learning system is the *(PE)*. *(PE)* refers to the perception of a person regarding the use of certain technology as enjoyable. *(PE)* indicates that is linked with positive intention and positive attitude towards using e-learning platforms (Payton, and Gomez, 2021).

The use of e-learning platform is also impacted by critical mass theory. If the use of technology is adopted by the masses, then, as per critical mass theory, it becomes easy to adopt. Thus, if e-learning platform is adopted by the majority of the educational institutions, it will be easy to adopt by the learners and teachers. The critical mass theory implies that a group population can make major contribution in the adoption of certain technology (Kulkarni, and More. et al, 2020)

1.2 Problem Statement

The adoption of e-learning platforms has been studied internationally in terms of both developing and as well as in developed countries. According to the study of Olaniran (2008), in developed nations, e-learning has shaped the course of traditional education in a flexible and efficient manner (Olaniran, 2008). In the study of Kulkarni and More (2020), the factors that were taken into consideration were *(PEU)*, *(PU)* and individuals attitude towards adopting e-learning platform. In the study TAM model was used to analyse the willingness of

students of the European countries. The study concluded that adoption of e-learning was positively affected by the students' positive attitude. The study of Faria and Al Maroof indicates that most researchers have analysed that e-learning platforms are readily accepted by developed countries (Faria and Al-Marroof, 2020). According to the research work of Faria and Mariam, in developing countries, it is still underutilized. Their study has taken into consideration these factors including internet experience, self-efficacy and system characteristics and enjoyment. It has also taken into consideration critical mass theory as a facilitating factor for adoption of e-learning platform. The conclusion of the study was that PE and internet experience motivates pupils to use e-learning platforms (Faria & Mariam., 2017). Al-Marroof, et al, (2021) has highlighted that the more the barriers and challenges with respect to perceived use of e-learning platform are addressed, the higher the chances will be of the adoption of e-learning systems. The study of Kanwal, and Rehman, (2014) has highlighted that in Pakistan, the researchers are focused on exploring the impact of the online platform on selected students' sample size. Previously, the research has been done on the post-COVID adoption of e-learning platforms. None of the research has been found exploring the variables such as PE, PEU, perceived usefulness, perceived self-efficacy, and critical mass theory and its impact on the adoption of e-learning platforms (Kanwal, and Rehman, 2014)

Pakistan is a developing country. Currently, 75% of the people in Pakistan uses the internet and almost 45% uses e-learning platforms. 65% of the population still struggles to make use of e-learning platforms (Farid et al, 2021). There are many factors that contribute to the less percentage with respect to the adoption of e-learning platforms. These factors include limited access to internet, lack of education to learn new systems and techniques and resistance to adopt technology in the class room. Therefore, in Pakistan only 45% population has adopted e-learning platforms (Iqbal and Campbell, 2021).

Considering the current COVID 19 pandemic situation, adopting e-learning platform has become the need of time. To cover the gap, this study will examine the factors that affect the usage of e-learning platforms. The study will further try to establish a relationship between the factors such as perceived daily routine, self-efficiency, PEU, PE, PU and impact of critical mass usage. This will help in exploring the gaps that need to be fulfilled for accepting e-learning platform in the post-COVID phase.

1.3 Research Objective

1.4

The aim of this research work is to explore the relationship between the acceptance of e-learning platforms and perceived daily routine, self-efficiency, *Perceived Ease of Use*, perceived enjoyments, perceived usefulness, and impact of critical mass usage on adopting e-learning platforms by teachers and learners

1.4 Research Question

How the factors perceived daily routine, self-efficiency, *Perceived Ease of Use*, perceived enjoyments, perceived usefulness and impact of critical mass usage affect the use of e-learning platforms after the spread of COVID-19?

1.5 Significance of the study

Within the context of Pakistan, very little research work has been done to explore the factors that are affecting e-learning system in the country. Due to the lack of proper research, the evidence regarding the affecting factors are less. Therefore, efforts are needed to be invested in order to explore the factors so that the mechanisms can be derived that can help addressing e-learning challenges in the higher education sector of Pakistan. The purpose of this study is to analyze the gaps that exist in the adoption of e-learning platform by the educational institutes. This study will further help in analyzing the ways and methods to bridge the gap in the adoption of e-learning platform.

1.6 Limitation of the study

This study is concentrated to the Karachi city only. Due to the concentration of Karachi city, it is difficult to imply that the study depicts the situation e-learning challenges of higher education of the entire country. Furthermore, the sample size is less than 250 which makes it difficult to generalize the result on the entire population of the country.

1.7 Organization of the study

This research work is comprised of five chapters. Chapter one is the introduction and sets out the entire scenario of the research work. Chapter one includes background of the research work, research question and objective, significance, problem statement and limitation of the research study. Chapter two is the literature review. It includes the details of theoretical framework that has been adopted for this research work. This chapter further includes the definitions and explanation of the variables followed by the empirical evidences of the previous research work. Chapter three includes methodology which includes the description of the methods and techniques that has been for the collection of data and for interpretation of the result. Chapter four includes the analysis and interpretation of the results followed by the discussion on the analysis. Chapter Five is the final chapter and includes conclusion and recommendations.

CHAPTER 2

LITERATURE REVIEW

2.1 Theoretical background

The theoretical model for this research work is adopted from the theory of TAM (Technological Acceptance Model) proposed by Davis (1989). The theory has been used with some alterations in order to explore the effect on sales, business performance, identification of customer's need, and exploration of connectivity with the customer along with employees' creativity. The technology Acceptance model is used generally by the researchers to explore the acceptance of the new technology. This model is commonly acceptable and very influential as it also helps in identifying the utility and technology acceptance (*Kozar & Lee, 2003; Graaf, Allouch, & Dijk, 2018*). The TAM model includes dependent and independent variables. The independent variables of TAM are (PEU) (PEOU) and (PU)(PEU). There are three factors which has increased the popularity of TAM model (Choe & Noh, 2018). TAM model is thrifty, IT specific and is designed specially in providing clarification regarding the adoption of different technologies. The model provide accurate predictions with reference to multifarious cultures, diverse population, different organisations and level of expertise. The model has strong theoretical base which is supported with the different psychometric scales of measurements. This model in addition has the potential to emerge as the preeminent model which can be used to predict acceptance of technology with in depth explanation. (*Yousafzai,, & Pallister, 2008; Maartje et al., 2016*). The two underlying factors of the TAM Model that is PEOU and PEU includes many inherent factors such as attitudes and intentions. This success of this model has also provide basis to many other predictive models (*Maartje et al., 2017*).

The independent factors of TAM model that is PEOU and PEU has been used along with other financial and technical factors that can impact the adoption of e-learning platforms post COVID. To conduct in-depth investigation, this research work has also used other factors such as Self Efficiency (SE), (PE)(PE), Perceived daily routine (PDR) and Critical Mass Theory (CMT).

2.2 Hypothesis Development

2.2.1 Perceived Daily Routine (PDR)

Perceived daily routine can be defined as the percentage to which the technology can become daily part of work and its user become part of daily routine for the users (Eldeeb, 2014) According to Saga et al, if the technology is used in normal day use, it becomes part of daily routine of an individual. Individuals who use e-learning platforms on daily basis readily adopts such platform for learning purpose and considers using e-learning platforms handy. Thus their study proposed that perceived daily routine has strong relation with use of e-learning platform. (Saga et al, 1993). In the work of Sundaram et al, it is highlighted that the users who have extrinsic motivation considers making use of e-learning platforms on daily basis. Thus, the users who are more motivated to use e-learning platform on daily basis readily considers using technology for studying as it can enhance their experience of learning. (Sundaram et al, 2007). Barki, and Hartwick mentioned that, it should be keep into consideration that the impact of daily routine can vary from one user to another. This variation is due to the fact that some users might be using technology for different purposes. Thus the users who use technology for the purpose of learning can consider integrating technology as part of their daily routine, thus indicating significant relation between the two factors (Barki, and Hartwick, 1994). Gamdi, and Samarji, 2014 have highlighted in their work that, when the individuals use certain technology on daily basis, it instill the skillset in them to use it more effectively. Thus such individuals can easily handle technology on daily basis as part of their daily routine, whether it be for work or studies (Gamdi, and Samarji, 2014) On the basis of above literature work, it can hypothesized that;

Hypotheses 1 (H1): Perceived daily routine has a significant impact on the acceptance of e-learning platforms.

2.2.2 Self-Efficiency (SE)

Self-efficiency can be defined as the ability of the user to perform certain tasks effectively and efficiently. The work of Raudenbush et al, has highlighted that the self-efficiency concept was first used by Albert Bandura. He used the concept in the context of social cognitive theory and proposed that self-efficiency plays a significant role in determining the learning behavior with respect to using technology in learning, therefore, indicating a noteworthy relationship between the two variables (Raudenbush et al, 1992), According to Balkaya and Akkucuk, in the classroom, it has been observed that the students who are efficient in using technology, makes use of e-learning system more readily. Thus the study pointed significant relation between the use of e-learning systems and self-efficiency (Balkaya, and Akkucuk., 2021). Compeau, and Higgins, further provided evidence of the significant relationship between the two variables. They pointed out that, the teachers who are more aware of using technology and practice self-efficiency, are more efficient in getting the task done by the students in e-learning systems. Since their understanding and efficiency level is greater, they have deeper understanding of how to guide the students towards using the technology to get the work done (Compeau, and Higgins, 1995). As per the research work of Saba (2012), it has been observed that, self-efficiency can impact the adoption of e-learning systems. The students and teachers who are self-efficient in using e-learning platform have fair idea regarding the use of e-learning platform. They tends to make most of e-learning platforms and therefore, performs their tasks in a better and effective manner (Saba, 2012)

Hypotheses 2 (H2): Self-efficiency has significant impact on the acceptance of the e-learning platform.

2.2.3 Perceived Usefulness (PU)

PU refers to the degree to which a specific system will contribute towards enhancing performance. Camiller mentioned that PEU is one of the important factors that has been taken into consideration and that can influence e-learning. The usefulness dimensions can assist in increasing the utility of e-learning platforms and

can help them to make learning more effective and efficient during COVID time. Thus the *(PU)* compels the individuals to readily adopt e-learning systems (Camilleri, 2019; Raza et al., 2021). According to Park, et al (2016), in the situation where the students and teachers perceives that using the technology will considerably increase the learning process, then it is more likely for the students and teachers to adopt the technology (Park, et al 2016). Rahmi et al, 2018 have highlighted that, in a number of situations, the PU has a positive effect on learning effectiveness. This is due to the fact that usability is the quality that can reflect ease of use and willingness to adopt by the individuals. Therefore, if students and teachers consider using certain e-learning systems more effective and consider their greater utility for them, then in this situation, they are more willing to adopt the e-learning systems (Rahmi et al, 2018; Raza et al., 2021). Amsal et al, 2021, has mentioned that, individuals who use information system will adopt certain system if they are on the opinion that it can enhance their performance. Therefore, in the situation, where the teachers and students are already familiar of certain e-learning system, which can enhance their productivity and hence will be more willing to adopt such systems. Thus, *(PU)* can impact the adoption of e-learning platform (Amsal et al, 2021).

Hypotheses 3(H3): The relationship between *(PU)* and e-learning platform is significant

2.2.4 Perceived Ease of Use(PEU)

(PEU) is defined as the perception as to which the system under consideration is considered to be used free of effort. According to the study of Haroon, et al, it has been observed that PEU has indirect and direct impact on the intentions of students and teachers, for using e-learning platforms. The study has further highlighted that if it is perceived that using a particular technology includes minimum or no effort, the institutions are more inclined to accept and to use the technology (Haroon, et al, 2017; Raza et al., 2019). Chatterjee and Kar further elaborated that it is a matter of common observation that, if the users find any innovation useful, they are more motivated to use it frequently. Thus this signifies the positive relationship between e-learning platforms and PEU (Chatterjee, and Kar, 2020). According to the work of Arunachalam, (2019), when an individual

perceives that using a certain system of performing some action is easy, then the individual tends to develop a positive attitude about it. The students in this context should feel that using e-learning system will contribute towards becoming more skillful. Thus, in the said scenario, the variable has positive effect on usage intention (Arunachalam, 2019), Yuen, and Ma, 2008, has highlighted that perceived use of use is an important determinant of intention and also indicates positive behavior of user acceptance of adopting a certain system. Thus, (*PEU*) is a positive indicator of the adoption of an e-learning platform (Yuen, and Ma, 2008; Qazi et al., 2021).

Hypotheses 4 (H4): The (*PEU*) has a significant impact e-learning platform acceptance.

2.2.5 Perceived Enjoyment(*PE*)

PE can be defined as the degree to which the use of certain technology is perceived as enjoyable other than that of performance consequences. Piedrahita et al, 2021 mentioned that, as per his work, PE has a positive relationship with the positive attitude towards using e-learning platforms. It also leads towards the attainment of a high level of educational goals through encouraging the students to achieve the said goals (Piedrahita, et al, 2021). In the work of Mahler, A.; Rogers, (1999) it is mentioned that using e-learning platforms for studying purposes is an important determinant of learning outcomes for students. The more the students get familiar with the e-learning platforms, the more they enjoy using such platforms and it directly impacts their learning outcomes (Mahler and Rogers, 1999; Guoyan et al., 2021). The work of Kwon has highlighted that, during the COVID times, the students who were efficient with the e-learning platform found it more useful for learning purposes (Kwon, 2018). Hussein (2018) mentioned that, in learning, students' readiness, feeling of joy, enjoyment, pleasure, and relaxation also play a critical role in instilling holistic behavior and in influencing the usage of e-learning systems. The research highlighted that (*PE*)has significant role in the e-learning platforms acceptance.

Hypotheses 5 (H5): PE has a significant effect on the acceptance of the e-learning platform.

2.2.6 Critical Mass Theory (CMT)

Critical mass theory is a phenomenon where a group of people contributes towards the adoption of a certain set of actions. According to Bandura, in the context of critical mass theory, the behavior of an individual compels other to think that behavior is significant and therefore, other starts imitating that exact behavior. Same is the case in the adopting of e-learning platforms (Bandura, 1982). In another study, Bandura highlighted that, the influence of critical mass theory plays significant role in the acceptance of e-learning platforms. The fact of the matter is that when one user starts using technology and considers it beneficial, other people in the surrounding starts using the same to realize the benefits (Bandura, 1977). According to Baloran and Hernan, in the university, it a matter of common observation that whenever a collection of friends or users starts using technology, it becomes a common thing and other friends and peers start using the same technology to seek the benefit. This signifies that critical mass plays important role in accepting e-learning platforms (Baloran, and Hernan, 2020). Lou et al (2001) further mentioned that the perceived critical mass phenomenon compels people to adopt the technology more readily. It plays a significant role in convincing people that using certain technology is beneficial for tasks outcome. Thus it has important influence on the acceptance of e-technology (Lou, 2000)

Hypotheses 6 (H6): Critical mass significantly affects the intention to adopt e-learning platform

2.3 Empirical studies

Al Maroor et al, (2021) directed exploration work on "Elements That Affect E-Learning Platforms After The Spread Of Covid - 19: Post Acceptance Study". The point of the exploration was to examine the variables that can influence the post acceptance of e-learning stages. The independent variable of the review was the use of e-learning stage. The dependent factors of the review were, (PEU), perceived usefulness, self efficacy,

perceived critical mass, perceived enjoyment and perceived daily routine. The information for this study was gathered from online review. The sample size included 630 participants. PLS SEM was used to test the outcomes. The results showed that the relationship is significant and positive of the factors perceived ease of use, perceived enjoyment, perceived daily routine, perceived critical mass, perceived self adequacy on the use of e-learning stage. Though the relationship of (PU) was insignificant on the use of e-learning stage. The review suggested that, endeavors ought to be contributed to help the certainty of the understudies and instructors in the reception of e-learning stage (Al Maroof et al, 2021).

Elnagar et al, 2021; directed examination work on the "The exact investigation of e-learning post acknowledgment after the spread of COVID 19: a multi-scientific methodology based cross breed SEM-ANN". The point of this exploration was to look at the post acknowledgment of e-learning stage based on the calculated model that utilizes factors, for example, (PEU), perceived usefulness, self-adequacy, perceived daily routine, (PE), critical mass. The independent variable of the review was social goal with respect to the reception of e-learning stage. The dependent factors were (PEU), perceived usefulness, self-adequacy, perceived daily routine, (PE), critical mass, The sample comprises of 384 understudies and educators from various foundations utilizing Roscoe examining strategies. The review used SEM ANN to test the outcomes. The outcomes showed that (PEU), perceived usefulness, perceived routine use, (PE), perceived critical mass and self-efficiency has huge impact on the social expectation to use e-learning stage for meeting the instructive targets. The outcomes likewise demonstrated that (PEU) is the main indicator of reception of e-learning stage. The review suggested that the administration of advanced education is expected to adopt more suitable strategy to plan their approaches for supporting the reception of e-learning stages among understudies and educators (Elnagar et al, 2021)

The investigation of Hosseini, et al (2019) depended on "Effect of e-learning stage on the use goal among the understudies". The review examined what e-realizing stage meant for the demeanor of understudies towards

learning. Independent factors of the review were (PE), (PEU), and inspiration of the instructors to use e-learning stage. The independent factors were understudies mentality towards embracing of e-learning stage. The review gathered information from 300 existing e-learning stage users utilizing different e-learning stages. The review utilized primary condition demonstrating to test the relationship. The aftereffects of the review demonstrated that e-learning stages essentially affect the mentality of understudies towards learning. The outcomes uncovered that instructors commitment fills in as a worth added middle person in impacting the disposition of the understudies to use e-learning stage. The review suggested that the educators should utilize e-learning procedures to impact the demeanor of understudies towards e-learning stages. The concentrate likewise suggested that the subjective examination is should have been attempted to acquire a superior and top to bottom comprehension of the experiences of the understudies and educators in regards to the impact of e-learning stage on the learning mentality of the understudies (Hosseini, et al 2019)

The review led by Adam, et al. (2016) on point "Effect of e-learning stages on concentrate on performance of the understudies". The point of the review was to break down the effect of e-learning stages on the performance results of the understudies. The review used e-learning stage as the independent variable. Use of various gadgets and web association and self-adequacy were used as dependent factors. The review gathered the information from 135 members. The review developed and tried four theories. Quantitative methods, for example, Correlation and Anova was used to test the speculation. The outcomes showed that the Students and educators use various advances to direct and go to online classes. The outcomes inferred that the ramifications of use of various innovations for e-learning on Students and educators is critical. The review suggested that a similar exploration ought to be led for a bigger scope to sum up the discoveries on a bigger population(Adam et al;2016)

Zamrudi, Z., &Wicaksono, T. (2018) led research work on "the reception of e-learning stages by educators and understudies". The independent factors of the review were the expectation, mentality towards stage, help

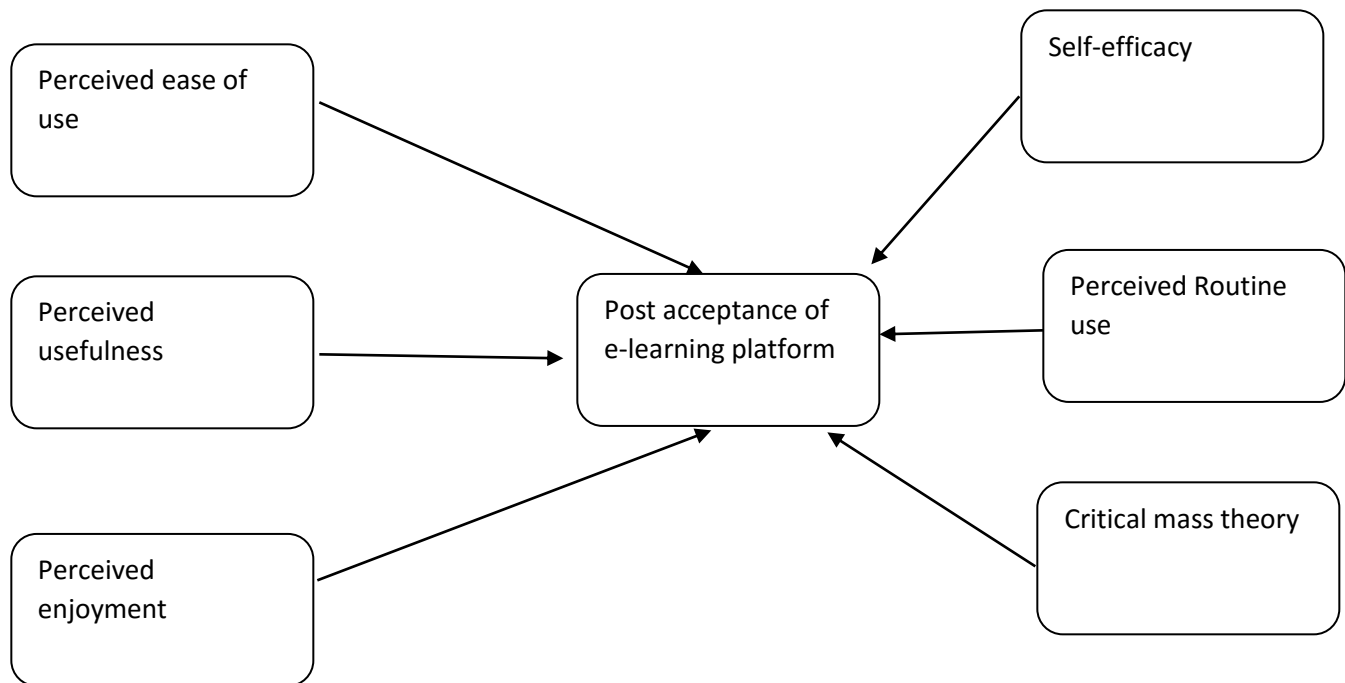
condition, and (PU) towards online stage. The dependent factors were recurrence of utilization of e-learning stages by understudies and instructors in their daily routine. The review depended on 45 Sasirangan Students and educators operating in South Kalimantan Province. The review used PLS-SEM as software to investigate the connection between the factors. The outcomes inferred that overall Students and instructors demonstrated less eagerness to use online stages for learning (Zamrudi and Wicaksono, 2018).

The investigation of Naqvi et al (2020) was focused on "The use of e-learning stages in Pakistan and its effect and related patterns". The paper attempted to investigate the arrangement level of the Students and instructors of Pakistan towards utilizing e-learning stages. The paper broke down the sort of correspondences, the impact of online stages, and the (PE) of the two Students and educators. The dependent variable was the time consumed on daily premise utilizing e-learning stage. The survey was used to gather the information from 380 understudies. The review used cross tabs and recurrence tables for the examination. The consequences of the review presumed that Students and educators consider online channels vital. There are numerous understudies and instructors in Pakistan who use web-based media stages, for example, YouTube to master various abilities. The concentrate additionally uncovered that people are bound to get drawn to use e-learning stages assuming they are given time adaptability (Naqvi, et al 2020)

The investigation of Khan, et al (2019) led research on "Use e-learning stage on the performance of understudies and educators". The review used online media utilization and perceived daily routine as an independent variable and performance as the dependent variable. The review utilized a Likert scale poll to gather the reactions from the members. 276 members were drawn closer and the information was gathered from them. The information were examined utilizing the primary condition demonstrating approach. The outcomes presumed that use of e-learning stages can decidedly affect the performance of the understudy. The outcomes further showed the establishments that use-learning stage will in general have a superior and shrewd methodology towards pedagogical procedures (Khan et al, 2019).

Razak and Latip, (2016) led research work on "Effect of the use of e-learning stages in the instructive field". In the review Ease of Use, Enjoyment and Usefulness were used as an independent variable while use of e-learning stage was used as a dependent variable. The review was subjective examination and depended on optional information. The information for the writing was gathered from different diary articles. The outcomes showed that few variables make social e-learning stage useful in instruction field. These variables are ease of use, enjoyment, and usefulness. The review was gainful for schooling professionals and can give them direction in regards to the viable use of e-learning stages in the training field (Razak and Latip, 2016)

2.4. Conceptual model



CHAPTER 3

METHODOLOGY

3.1 RESEARCH PURPOSE:

There are 3 types of purposes mostly used for research: Descriptive, Explanatory and Exploratory. In this study explanatory research approach is used. Explanatory research method is used for the problem which is not completely explored. It has helped in generating explanations through in depth analysis. This research method has helped in exploring and investigating the research problems that was not research before, in-depth in the context of Pakistan.

3.2. RESEARCH APPROACH

There are 3 commonly used approaches; Quantitative, qualitative and mixed approach. A quantitative approach was applied for this study. For the quantitative analysis, primary data collection method was adopted to collect the data from the participants. Quantitative research has helped in collecting and analyzing numerical data (Ali et al., 2021). It can be used to make predictions, find averages and patterns, generalize results and, test causal relationships, and to broader populations. PSL-SEM was used to analyzing the results.

Quantitative analysis has helped in reaching on to comprehensive results. It has also helped in completing the research work in the given time. Further, adoption of quantitative analysis has led towards removing biasness that is risk factor in case of qualitative analysis.

3.3. RESEARCH DESIGN

Co-relational research design was used for conducting this research work. This designed research is employed to measure relationships between variables and permit the prediction of future events from present knowledge. Using correlation design in this study can help open doors for other researchers to conduct the research work in future. It has also helped in determining the relationships between the selected variables and therefore, has helped in providing finding the impact of each variable individually (Raza et al., 2017; Khaskheli et al., 2020).

3.4. SAMPLE TECHNIQUE

The sampling technique which is employed is convenience sampling. The participants were included as per the ease of accessibility. This also helped in including the participants who were conveniently available to take part in this research work (Raza et al., 2020). The convenience sampling has further increased the chances of the inclusion of participants from diverse backgrounds. Also it was cost effective and less time consuming and thus helped in completing the research work in the given time and within budget.

3.5. TARGET AUDIENCE

The target audiences of the present study are the academicians, students and teachers who are currently connected with the higher education sector

3.6. SAMPLE SIZE:

The population of this study includes all the students and teachers who are linked with HSC in Karachi, Pakistan. The sample size of the study were 250 participants

3.7. STATISTICAL TECHNIQUE:

In current study PLS-SEM software has been used (Raza et al., 2018). The gathered data will be recorded in excel sheet. The data will then be entered into the software to analyse the relationship between the variables. Using PLS-SEM helped in easier testing of the relationships that exists between the variables. Also it helped in analysing the relationship of the selected variables in smaller sample size.

3.8. QUESTIONNAIRE

The closed ended questionnaire was designed for collecting the data for this research work. The questionnaire was designed on 5 point Likert scale. The participants were required to mark their responses on the options (1) strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly agree. The questionnaire for current study was adopted from Chatterjee, S., & Kar, A. K. (2020). Closed ended questionnaire has helped in collecting the desired responses from the participants in the limited period of time.

3.9. ETHICAL CONSIDERATION:

There were certain ethical considerations that were considered necessary for conducting the research work. For this research work, it was ensured that the participants were included in the research work out of their free will. The personal information of the participants was kept anonymous (Raza et al., 2020). Also, care was taken to ensure that the research study is free from plagiarism.

Chapter 4

Results

4.1 Data Analysis

This research work has used PLS-SEM for data analysis. (PLS-SEM) Partial least squares path modeling also known as partial least squares structural equation modeling is a structural equation modeling method that is used for evaluation the cause-effect relationship with complex variables (Raza et al., 2021). For this research work, PLS-SEM has been used to identify the relationship between the selected variables. There are two stages of the analysis. The first includes validating the calculation model which is proceeded by the valuation of the structural model.

4.1.1 Measurement Model

There are seven constructs that have been used in the conceptual model. The evaluation of measurement model will be made through the construct validity and reliability. The construct reliability is evaluated through composite reliability and Cronbach's alpha (Fornell & Larcker, 1981; Raza & Khan, 2021).

In this research work, the Cronbach's alpha least value of 0.6 has been considered (Black, & Anderson, 2010).

In Table 2 the estimates value of Cronbach's alpha is indicated. According to the table the lowest value of Cronbach's alpha is 0.7 which is higher than the set value of 0.6. Thus on the basis of the estimation, it can be inferred that the constructs that has been used in this research work are consistent and reliable (Larcker, 1981).

Table 2 Measurement model results.

Constructs	Items	Loadings	Cronbach's α	Composite reliability	Average Variance extracted
PCM	PCM1	0.704	0.788	0.794	0.597
	PCM2	0.850			
	PCM3	0.811			
	PCM4	0.865			

PDR	PDR1	0.840	0.851	0.703	0.562
	PDR2	0.913			
	PDR3	0.934			
PE	PE1	0.838	0.734	0.828	0.552
	PE2	0.849			
	PE3	0.845			
	PE4	0.739			
PEOU	PEOU1	0.726	0.818	0.801	0.670
	PEOU2	0.926			
PU	PU1	0.837	0.721	0.827	0.548
	PU2	0.879			
	PU3	0.801			
	PU4	0.825			
SE	SE1	0.740	0.78	0.853	0.598
	SE2	0.889			
	SE3	0.716			
	SE4	0.788			
USE	USE1	0.789	0.838	0.89	0.671
	USE2	0.877			
	USE3	0.855			
	USE4	0.749			

- **Convergent validity**

In order to test the reliability of questionnaire, 25 items of 7 constructs have been prepared. For ascertaining the constituency and validity of each construct, Composite reliability (CR) and Average Variance Extracted (AVE) of each construct has been estimated as represented in Table 1 . The value of cronbach’s alpha has already been evaluated above (Hair et al, 2017; Ahmed et al., 2021). For composite reliability, the results indicate the value between 0.7 to 0.899 which are also above the threshold value of 0.7 (Nunnally,1994). Thus, no error was indicated in both Cronbach’s alpha and composite reliability. This validates the construct reliability.

The results have indicated that considering the lowest acceptable value that is 0.5 (Natemeyer, Bearden, & Sharma, 2003), the values of AVE is greater than 0.7 in Table 1. The higher values of AVE as per the threshold also indicates the accuracy of convergent validity for each construct.

- **Discriminant validity**

In the results, if the constructs items of a construct can explain strongly that construct but is weak in interpreting the other constructs, then in that situation, the discriminant validity is said to be confirmed. Discriminant validity is confirmed, if average variance is higher as compared to the correlation coefficient of that construct as compared to other constructs (Gefen & Straub, 2005). In table 2 the, coefficient correlation and average variance has been estimated. It can be seen that the value of coefficient correlation is smaller than that of AV construct thus confirming the discriminant validity. In the table below, the diagonal figures are representing the value of AVs and the off-diagonal positions are representing the values of correlation coefficient. The bold numbers in the table signifies AV values.

Table 2 Discriminant validity			
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	PCM	PDR	PE	PEOU	PU	SE	USE
PCM	0.805						
PDR	0.261	0.860					
PE	0.509	0.356	0.843				
PEOU	0.300	0.339	0.367	0.819			
PU	0.368	0.379	0.330	0.477	0.840		
SE	0.265	0.326	0.326	0.545	0.514	0.773	
USE	0.467	0.395	0.310	0.597	0.596	0.655	0.819

The discriminant validity can also be confirmed by another method. In the table 3 if the cross loadings are smaller than that of loadings than the in that case the discriminant validity is confirmed. In the table 4 below, the value of cross-loading has been estimated and it has been observed that as compared to their correspondent cross loadings, loadings are greater. Thus this confirms the discriminant validity.

Table 4 Loadings and cross loadings.

	PCM	PDR	PE	PEOU	PU	SE	USE
PCM1	0.704	0.106	0.145	0.235	0.116	0.290	0.264
PCM2	0.850	0.105	0.180	0.550	0.132	0.279	0.243
PCM3	0.811	0.266	0.321	0.451	0.522	0.411	0.122
PCM4	0.865	0.186	0.104	0.264	0.225	0.366	0.504
PDR1	0.426	0.840	0.566	0.177	0.366	0.108	0.381
PDR2	0.119	0.913	0.535	0.240	0.517	0.383	0.146

PDR3	0.236	0.934	0.520	0.198	0.515	0.248	0.556
PE1	0.211	0.546	0.838	0.225	0.449	0.230	0.280
PE2	0.223	0.490	0.849	0.142	0.475	0.176	0.471
PE3	0.508	0.485	0.845	0.325	0.473	0.311	0.326
PE4	0.108	0.281	0.739	0.492	0.244	0.238	0.390
PEOU1	0.416	0.400	0.230	0.726	0.321	0.325	0.397
PEOU2	0.260	0.350	0.277	0.926	0.199	0.270	0.562
PU1	0.169	0.417	0.432	0.286	0.837	0.195	0.596
PU2	0.334	0.578	0.503	0.327	0.879	0.149	0.499
PU3	0.412	0.471	0.560	0.211	0.801	0.259	0.431
PU4	0.333	0.160	0.452	0.203	0.825	0.181	0.518
SE1	0.168	0.122	0.187	0.354	0.226	0.740	0.168
SE2	0.166	0.263	0.295	0.243	0.160	0.889	0.509
SE3	0.150	0.195	0.125	0.234	0.508	0.716	0.449
SE4	0.343	0.338	0.493	0.456	0.344	0.788	0.242
USE1	0.251	0.588	0.387	0.408	0.501	0.562	0.789
USE2	0.491	0.446	0.484	0.451	0.430	0.530	0.877
USE3	0.412	0.393	0.501	0.342	0.571	0.589	0.855
USE4	0.369	0.511	0.514	0.473	0.597	0.465	0.749

Another criterion for verifying discriminant validity is Heterotrait Monotrait ratio (HTMT). It is also used to measure discriminant validity. It can be observed in the table 5 below, all the values indicates that the

constructs depicts HTMT values which are less than 0.85, which is the threshold value(Gefen & Straub, 2005).

This confirms the HTMT ratio. Thus it also confirms the discriminant validity.

Table 5 Heterotrait-monotrait ratio							
	PCM	PDR	PE	PEOU	PU	SE	USE
PCM							
PDR	0.498						
PE	0.700	0.600					
PEOU	0.442	0.447	0.574				
PU	0.539	0.186	0.709	0.126			
SE	0.808	0.817	0.807	0.788	0.792		
USE	0.517	0.590	0.720	0.188	0.190	0.755	

4.2 Structural Model

From the 25 questions and 7 constructs, the statement (items) have been identified. In the literature review, the conceptual model was provided based on six hypotheses. The PSL-SEM analysis has been used for validating the conceptual/ structural model. After conducting validation test, it has been observed that, 2 hypotheses H4 and H6, out of six were not supported. These two hypotheses are (H4) (*PEU*) (PEOU) and (H6) self-efficiency (SE) on use of e-learning platform

Table-6 Standardized regression weights for the research model.					
Hypothesis	Regression Path	Effect type	SRW	p value	Remarks
H1	PCM-> USE	Direct effect	0.078	0.003	Supported
H2	PDR -> USE	Direct effect	0.132	0.044	Supported
H3	PE-> USE	Direct effect	0.237	0.032	Supported
H4	PEOU -> USE	Direct effect	0.116	0.240	Not Supported
H5	PU -> USE	Direct effect	0.280	0.052	Supported
H6	SE -> USE	Direct effect	0.153	0.265	Not Supported

To test the relationship between the hypothesis constructs, the measurement model is converted into the structural model. As per Table 6, it can be observed that hypothesis 4 and Hypothesis 6 is not supported whereas H1, H2, H3 and H5 are found supported.

4.3 Discussion

According to the results of the table 6, it can analysed that PCM has a positive and significant relation with the use of e-learning platform with values of ($\beta = 0.078$ and $p\text{-value} = 0.003$). Thus these values support H1. The same can be supported from the research work of Lee, 2006 in contrast with the study of (Czerniewicz, and Brown, 2009). Both the studies have indicated that perceived critical mass is significant factor that effects the use of e-learning platforms in large groups. Thus, if the technology is used by a group of students and teachers, it is highly likely that it will impact the other groups and motivates them towards adopting the e-learning platform use. Therefore, the adoption of e-learning platfro during COVID 19 would receive less hindrance.

According to table 6, H2 is also supported. The perceived daily routine is found to have a positive and significant relationship with e-learning platforms use with the values of ($\beta= 0.132$ and $p\text{-value} = 0.044$). It is found consistent with the study of (Mbarek, and Zaddem,2014). The study of Elkaseh et al, 2016, is also found consistent with the mentioned result. The result implies that, if the students and teachers are daily involved with the use of e-learning technology, then it is highly likely that they will readily adopt e-learning systems amidst COVID 19.

Hypothesis 3 that is (*PE*) has a positive and significant relationship with e-learning platforms use with values of ($\beta= 0.237$ and $p\text{-value} = 0.032$). The results have been found relatable with the work of Baalog, and Pribeanu, 2011 and with the study of Khalid, 2014. It has been analysed that, (*PE*) instills a positive attitude amongst the students and teachers and motivates them to adopt e-learning easily. Also, if the students and teachers find something enjoyable, there are higher chances that their task outcome will be improved, thus indicating a significant relationship between the two variables.

According to hypothesis 4 (*PEU*) have a positive but insignificant relationship on of e-learning platform use with the values i.e. ($\beta = 0.116$, $p = 0.240$). This relationship is further supported in the study of Turner et al., 2011; and the study of Venkatesh et al., 2013. The study has mentioned that the (*PEU*) includes two ingredients that are self-efficacy and simplicity of the technology. Thus, with the lower level of self-efficiency, (*PEU*) would be lower and therefore, it would not be a motivating and influential factor for the students and teachers for the adoption of e-learning platform during COVID 19.

Hypothesis 5, that *PU* has positive and significant relationship with e-learning platform use with the values ($\beta= 0.280$ and $p\text{ value} = 0.052$). Thus the relationship between these two variables has been supported. The result is supported by the study of Elkash et al, 2016 and is also found relatable with the study of Abbas &Hamdy, (2014). The result infers that (*PU*)has been considered as one of the major predictors of intentions that can

indicate the expected use of technology by the students. *Perceived Usefulness*, therefore, indicates a significant influence on behavioral intentions to e-learning platforms use

Hypothesis 6, that is self-efficiency has positive but insignificant relation with e-learning platform usage amongst the students and teachers with the values of ($\beta = 0.153$ and p value = 0.265). The results are reinforced by the studies of Thakkar, and Joshi, 2018 and also by the study of Latip et al 2020. The result suggests that, self-efficiency is although one of the contributing factor in supporting the adoption of e-learning platform. But this factor does not motivate the adoption in majority of the students and teachers. Therefore, it cannot be said for sure, that the students and teachers who are efficient with the use of technology might consider using e-learning platform beneficial and therefore, might not be motivated to adoption e-learning platform.

Chapter 5

Conclusion

5.1 Conclusion

The use of e-learning platform has become increasingly important amidst COVID 19. E-learning platform and its adoption does not only provide ease in getting the curriculum completed but also contribute towards increasing the learning efficacy, if adopted wisely. This study was directed towards identifying the factors that can affect the e-learning platforms use amongst teachers and students during COVID 19. The factors that were considered in this study were PEOU, PU, SE, PE, CM, and PDR. Six hypotheses were created and were tested for finding out the results.

For this research work data was gathered through the questionnaire survey. The responses of 250 participants were collected and observed. PLS-SEM was used to conduct the analysis. The results of the hypothesis revealed that Self Efficiency and (*PEU*) have a positive but insignificant relationship on e-learning platforms usage by teachers and students. The results also conclude that perceived usefulness, (*PE*), perceived daily routine, and perceived critical mass have a positive but significant influence on e-learning platform adoption. Thus the results indicate that in order to motivate the intentions of students and teachers regarding learning platform usage during COVID 19, the institutes should address the usability concerns of students and teachers and should convince the students and teachers to look up to the benefits of using such platform and its impact on the increased learning outcomes.

5.2 Managerial Implications

In Pakistan, usage of e-learning system is not common in the educational institutes. The students and teachers finds it difficult to make e-learning system usage on daily basis. This challenge specially emerged after the spread of COVID 19, when the online classes became the need of the time.

In order to address the said challenges, the management of educational institutes is required to invest efforts to educate and train faculty members regarding the importance and e-learning platforms usage. The training should likewise be conducted for the students in order to make them informed about the benefits of using e-

learning platform. Increasing the knowledge and skills of students and teachers will result in enhancing their perception about usefulness of such e-learning platforms.

The management should design and conduct specialized training courses for the staff members. It will result in increasing their self-efficiency in using e-learning platforms. This will also enable the teacher to use e-learning platforms and to complete the course on time, in case of lockdowns.

The management of educational institutes should also provide proper manual of the e-learning system which has been adopted by the institute. A demo by the expert will help in improving the skills of the teachers and will also help in creating good perception regarding (*PEU*).

Good system should be installed to ensure that the systems that are adopted for e-learning are efficient and effective. Providing a conducive environment will enable the students and teachers to enjoy the use of the system and also result in increasing their efficiency level

The educational institutes should ensure resource availability that can support the adoption of e-learning platform on daily basis.

The management should encourage small groups in the educational institutes to use the adopted e-learning system. This can help in the mass adoption of the adopted system in the educational institutions,

5.3 Future Recommendations

This research work has been done in the limited time period. Due to time constraint, the scope was limited. Also in such short span of time, collecting data from large sample size was difficult. The data is mostly collected from the students and teachers of Karachi. Therefore, the current results cannot be generalized on to entire Pakistani population. To have better insight regarding e-learning platform adoption amongst the teachers and students of Pakistan, post COVID, more studies should be conducted that can include larger sample size from all over Pakistan. Also, there are other factors, such as motivation to adopt e-learning system, impact on

learning outcome, that have not been considered in this research work due to time constraint. Therefore, future studies should further take into consideration other factors that can explore the research topic in detail.

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