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How E-Learning Is Reshaping the Education Industry of Developing Economy? An Evidence from PLS-SEM Approach

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Abstract

The tremendous advancement of information technology has altered the way education is delivered. Students are increasingly opting for e-learning in order to improve their academic success. Explanatory research was chosen since it is based on a well-established principle and clarifies the relationship between the independent and dependent variables. Computer self-efficacy (CSE), goal-setting (GOS), meta-cognitive strategy (METS), and online environment (ONE) are independent variables, whereas academic performance is the dependent variable (ACS). The study examined multidimensional interactions in e-learning to investigate the impact of e-learning applications on academic success. The goal of the study is to increase students' academic performance. A questionnaire was used to collect data from students, and the structural equation model (SEM) was used to prove assumptions. The positive relationship between goal setting, computer self-efficacy, metacognitive strategy, and social interaction with academic success was proposed in this study, and three of the five hypotheses were accepted. However, the finding shows that the relationship between goal setting and computer self-efficacy on academic success was insignificant. The findings of this study will assist higher education institutions in improving their e-learning methods and efforts. In addition, the research model employed helps to a better knowledge of e-learning in both theory and practice.

Keywords: e-learning, goal-setting, metacognitive strategies, computer self-efficacy, online environment, academic success, developing economy, PLS-SEM.

CHAPTER # 1

Introduction

1. Introduction

1.1. Background of the study

The internet and the rise of information technology have transformed the way education works. E-learning is accessible to anybody with an Internet connection. Students are increasingly turning to e-learning as a means of mastering academic programs and learning new material. The Internet serves as a teaching tool by providing students with tutorials, study materials, and online courses, among other things. (Chiu et al. 2013). Online courses can be taken independently or in groups. Faculty may inspire students by sharing information from anywhere in the world thanks to the advent of e-courses. These would be the basis for the evolution of e-learning, which enable the students and others to use modern technology to study and enhance their knowledge, talents, and attitudes. (Larbi-Siaw et al. 2016).

Students that use e-learning face a challenge when it comes to getting new knowledge and interpreting instructional courses. Institutions provide courses online as part of their curricula, and students who perform in them earn credits toward their degree. (Cohen et al., 2017). Universities are increasingly resorting to e-learning, which is viewed as an important aspect of their long-term development strategy. Because of online courses and studies, higher education institutions are now much more approachable to potential students.. As a result, institutions, in addition to traditional learning techniques, provide learning opportunities through e-learning platforms. Students learn the same knowledge as e-learning tools, which might have a negative impact on classes. (Wilson & Cotgrave, 2016). However, For full-time students, e-learning platforms should only be used as a supplement to studying, not as the exclusive source of knowledge. (the formation of blended learning) (Ejubović & Puška, 2019). however traditional learning methods provide the foundation for obtaining knowledge, full-time students should be placed in a classroom.

1.2. Problem Statement

In previous study it has been analyzed that the use of e-learning has increased by 10% per year since 1996 in the, Canada, United States and Western Europe, while developing countries are lagging behind (Zoroja, Skok, and Bach, 2016). In Malaysia, Mexico, Singapore, Thailand South Korea, India, Taiwan, Brazil, and Eastern European countries, the use of e-learning is expected to increase in the next decade. Although e-learning is developing rapidly in developing countries, There are still various major hurdles to be overcome. (Valencia-Arias, Chalela-Naffah, and Bermudez-Hernández, 2019). Several elements may explain the shortcomings of e-learning in developing countries and has mentioned some factors, such as the poor use of modern technology due to insufficient financial and technological resources (Mugo, Njagi, Chemwei and Motanya, 2017). Another study stated that technical problems are an important perspective in the introduction of e-learning technologies in the educational system. These include configuration, elegance of the latest technology, high-speed Internet connection, flexible and uninterrupted power supply, maintenance, organization, security and lack of technical support. Technical staff should be available to students according to study (Holmes and Prieto, 2018). furthermore, The availability of personal computers at home is often not a reality for many people in developing countries. Therefore, unequal access to computers can be a major challenge to student acceptance of this technology (Gonzalez, McCrory, and Lynch, 2020). English as an educational tool is an obstacle to the development of e-learning in non-English-speaking countries such as Pakistan, India and Bangladesh etc. A survey conducted by Issa and Jaaron (2017) with a population of 170 million and an increasing literacy rate of 57.9 percent (2010 Economic Survey) depicts that Pakistan ranks 160th, even in terms of literacy rates. Access to primary and higher education is a continuing challenge to the country's ability to develop its human capital and move towards a

knowledge-based economy. In addition, the limited education budget of 2.1 percent of GDP reduces the likelihood of investing in infrastructure to support the transition from traditional education systems to new learning methods. The situation is even worse in rural areas, where the literacy rate is 48 percent, due to the lack of educational institutions, high-quality faculty and less awareness on the importance of education (Economic Survey 2010).

There are currently three virtual universities in Pakistan: Allama Iqbal Open University, COMSATS University and Pakistan Virtual University. Most of the virtual campuses are located in Punjab and Sindh. In addition, other universities have gradually adopted e-learning methods such as learning management systems and video conferencing as an alternative to traditional university education. While these initiatives have been encouraging, Pakistan really needs to make great steps in the use of e-learning to engage with international teaching standards. Many researches have been performed out in the original world, but there has been minimal research carried out in Pakistan, according to one of the discovered gaps. As a result, there have been few studies on student satisfaction with e-learning systems, As a result, we will bridge this gap by doing high-level research in our country.

1.3. Research Objective

The purpose of this research is to find out how e-learning is reshaping the education industry. It also takes into account the perspectives and experiences of students in the e-learning field.

1.4. Research Question

RQ: What influence do the factors of e-learning have on the perception of student satisfaction?

1.5. Significance of the study

The findings of this study will assist HEIs (Higher education institutions) in developing their e-learning systems so that students may use them to succeed in school. Higher education institutions

must look into whether these e-learning platforms help students obtain better results while studying. They can then decide whether their company's development strategies should be based on these platforms, alternative platforms, or even abandon e-learning altogether. In addition, the information acquired will be utilised to evaluate students' abilities and establish whether their e-learning practices are positively impact on their academic performance. Students may need to be instructed on how to use e-learning platforms first, according to HEIs. According to research, students learn how to use e-learning systems perform better in their studies.

1.6. Limitations and Delimitations

According to this research, there are some limitations: The first restriction in our study is that we were only able to get questionnaires filled out in the karachi city only. In Similarly, the data was acquired through an online survey that included only 251 respondents who had used an E-Learning System.. Therefore, sample size was also a limitation. This research is also limited to the number of variables. The independent variables used to find out its influence on Students' Satisfaction, could have been more or less.

1.7. Organization of the study

This research report is divided into five parts or chapters mainly; the first chapter "Introduction" deals with the background of the study, problem statement, objective and questions of the research, significance of research and limitation of this research. The second chapter deals with "Literature Review" a detailed examination of the past researches that have been conducted on this topic. The third chapter deals with the "Methodology of Research" which further discusses the research purpose, approach and design as well as the sampling for the research and the statistical techniques which are used for this research. The forth chapter deal with the "Result" and the explanation and the conclusion that can be drive from the results. The fifth chapter consists of "Conclusion" which discusses the implications of the research's results as well as the recommendation for the future researchers. In the last sixth chapter of the research paper consist of "References" outlines the past researches, journals, books and other sources cited in different parts of the research.

CHAPTER # 2

Literature Review

2. Literature Review

2.1. Theoretical Background

The evolution of information technologies and the Internet has altered how the educational system functions. E-learning is accessible to anybody with an Internet connection. E-learning is becoming increasingly important to the students as a technique of mastering specific courses and learning new information. Students have access to a variety of knowledge via the Internet as a medium of instruction, including online courses, tutorials, and resources, among other things. (Chiu et al. 2013). Students can enroll in individual or group online classes. Faculty can promote themselves all over the world by sharing their knowledge and developing e-courses. These are the principles of e-learning, which allows students and people who use it to improve their knowledge, abilities, and attitudes through the use of modern technology. (Owusu-Agyeman and Larbi-Siaw, 2016). The concept of e-learning plays a significant role in higher education and is constantly developing due to its easy and adaptability to student expectations. (Richardson 2017). E-learning may be accessible at practically any time and from almost any location. (Eggermont et al. 2013) as long as there is Internet access. Full-time students, on the other hand, should use e-learning platforms to augment their studies rather than as a primary source of information. (Ejubović et al., 2019). students should be introduced to the classroom because conventional methods of study constitute the foundation for knowledge acquisition. Furthermore, students differ in terms of past knowledge, personalities, and learning styles, all of which can have a negative impact on academic success and graduation. 'Kauffman' (Kauffman, 2015). Students must achieve positive results in order to maintain using e-learning technology. As a consequence of this learning approach, you will be able to improve your academic performance. If e-learning tools assist students enhance their student success, they will continue to utilise them. Students, but at the other hand, will become less reliant on them if their grades decline.

2.2. Hypotheses Development

2.2.1. Goal setting

Goal setting is a key component of self-regulation and behavior change. It has been demonstrated to have distinct behavioural effects in a variety of settings, including industry, education, sports,

and health care. (Epton et al. 2017). Goal-Setting has the potential to affect academic performance, Many students have realised through thought that learning is a means of achieving essential life goals. (Schippers et al. 2020). Furthermore Goals are important in e-learning because they can help students concentrate on relevant resources, increase their efforts while learning, conquer learning problems, and perform much better.(Leigh Bruhn et al. 2017). In this way,They can receive the essential information by interacting with other e-learning participants, allowing them to more simply and quickly master certain topics and reach the defined goals. Aside from that, the learning environment in which pupils work is critical to their academic progress. As a result, the goal must be set in accordance with the work at hand, the learning environment, and one's trust in the learning process.(Xia et al. 2017). We developed the following research hypothesis based on the abovementioned.

H1: Setting goals for students utilising e-learning systems has a significant impact on their academic performance.

2.2.2. Metacognitive strategies

"Metacognitive strategies refer to approaches intended to assist students comprehend their learning style; on the other hand, it means a process designed to have students "think" their "thinking," according to the Inclusive Schools Network (2014)." "Teachers who use metacognitive strategies can have a positive impact on students with learning disabilities by helping them develop appropriate learning information plans. Students will employ these procedures to effectively acquire new information as they become more conscious of their learning style, resulting in them becoming more autonomous thinkers. Students' reading comprehension is influenced by metacognitive methods. It boosts kids' reading skills and enhances their reading performance. Students will become experienced and great strategic readers as a result of their familiarity with applying metacognitive strategies in reading tasks. The three steps of metacognitive strategic activities demonstrate the ability of strategically significant readers to automatically plan, monitor, and assess their reading abilities. By doing so, they took full advantage of reading and further

reached the target score (Muhid et al., 2020). Moreover, a previous study showed that students' academic success is influenced by their self-efficacy, which influences their learning-related emotions and metacognitive learning practises. Furthermore, learning-related emotions can have an impact on metacognitive learning techniques, which govern the impact of emotions on academic achievement (Hayat et al. 2020). As a result, they incorporate the abilities and control mechanisms of the learning process in order to achieve the defined objectives.. To employ metacognitive methods, people must first grasp how to appropriately handle cognitive knowledge and learning processes. Students' skills to analyse and enhance their own cognitive processes in order to better govern them and achieve better learning outcomes are the focus of metacognitive approaches.(Biasutti and Frate, 2018).We developed the following research hypothesis based on the abovementioned.

H2: Students' academic progress is influenced by metacognitive strategies used in e-learning.

2.2.3. Computer self-efficacy

A person's trust in their own abilities and confidence in utilising a computer to perform a task is referred to as computer self-efficacy (Deryakulu et al. 2016). An earlier study investigated the factors that influence students' willingness to use e-learning systems. The seven dimensions revealed in this study include computer self-efficacy, computer experience, enjoyment, system characteristics and subjective standards, perceived ease of use, and perceived practicality. People's perceived usefulness of e-learning will be influenced by computer self-efficacy, computer experience, fun, and system characteristics, while people's susceptibility to e-learning will be influenced by computer self-efficacy, system characteristics, and subjective norms. The perceived utility and ease of use of e-learning have an impact on whether or not people intend to use it (Nguyen et al. 2020).Furthermore, Computer self-efficacy is important for e-learning effectiveness, as a higher level of computer self-efficacy indicates a higher chance of learning success. Students that have a greater. They are more comfortable to work online and get greater results when they have a high level of digital self-efficacy. (Berkant, 2016). They also have an

easier time communicating with other students on an online learning environment. We propose the following research hypothesis based on the abovementioned:

H3: When it comes to the use of e-learning, students' computer self-efficacy has a significant impact on their academic success.

2.2.4. Online environment

In the online learning environment, learners play a critical role in achieving successful learning. Universities must consider their students' self-directed learning because online learning happens in a limitless amount of space and time (Lasfeto, 2020). Students, instructors, technology, courses, platform design, and the environment wherein students work are all critical factors in e-learning success (Cidral et al. 2018). A previous research found that the real environment in which students are taught has an impact on their achievement when it comes to e-learning. As a result, using an e-learning environment should not interrupt or distract students in any way; instead, it should be a knowledge and the process environment where students may obtain information that will assist them in achieving their objectives (Martinez-Lopez et al. 2017). The idea of personalising the e-learning experience and keeping students interested and participatory are two issues that e-learning platforms and procedures face (Moubayed et al. 2020). Students should focus on learning rather than opening portals, social networking sites, or other sites that may interact with the learning process to gain the greatest outcomes in e-learning. They should organise their own physical and online environments so that they can achieve established goals and tasks in the education and information technology learning process without being distracted (Zhou et al. 2017). We propose the following research hypothesis based on the above:

H4: Students' academic progress is significantly influenced by the online environment in which e-learning is used.

2.2.5. Social interactions

Social connection is not just an important part of traditional learning, but it's also an important part of e-learning (Lin et al. 2017). Through a number of internal communication tools, students communicate with other users in the e-learning platform. This allows students to share their

knowledge and collaborate on projects, which helps them better understand the subject and perform academically. Pupils are more motivated to use communication technology, according to the study, which boosts social engagement among students. Students are encouraged to use communication tools effectively, resulting in more social interaction. Encouraging larger levels of social connection has a good impact on students' willingness to participate in e-learning, and students are encouraged to use communication tools very frequently. (2018, Cidral et al.) Furthermore, online learning may be done at any time and in any place, it is thought that students' self-directed learning is particularly vital to the institution. Students can interact socially in the online method. Teacher-student interaction, student-student contact, teacher-subject interaction, and student-subject interaction are the four elements of online learning interaction. In an online learning environment, this study examines the relationship between self-directed learning and student social interaction. (Lasfeto, 2020). Moreover, It has been discovered that social influences have a significant impact on academic success. This article looks at students' academic achievement through the lens of social networks, social capital, and social support, with a focus on under-represented groups in higher education (Mishra, 2020). As a result, students gain vital information from their peers, allowing them to improve their academic performance. We propose the following research hypothesis based on the abovementioned:

H5: On e-learning systems, social interactions have a significant impact on academic performance.

2.3. Conceptual model

We created a conceptual model based on the research's hypotheses, which may be seen in Figure 1.

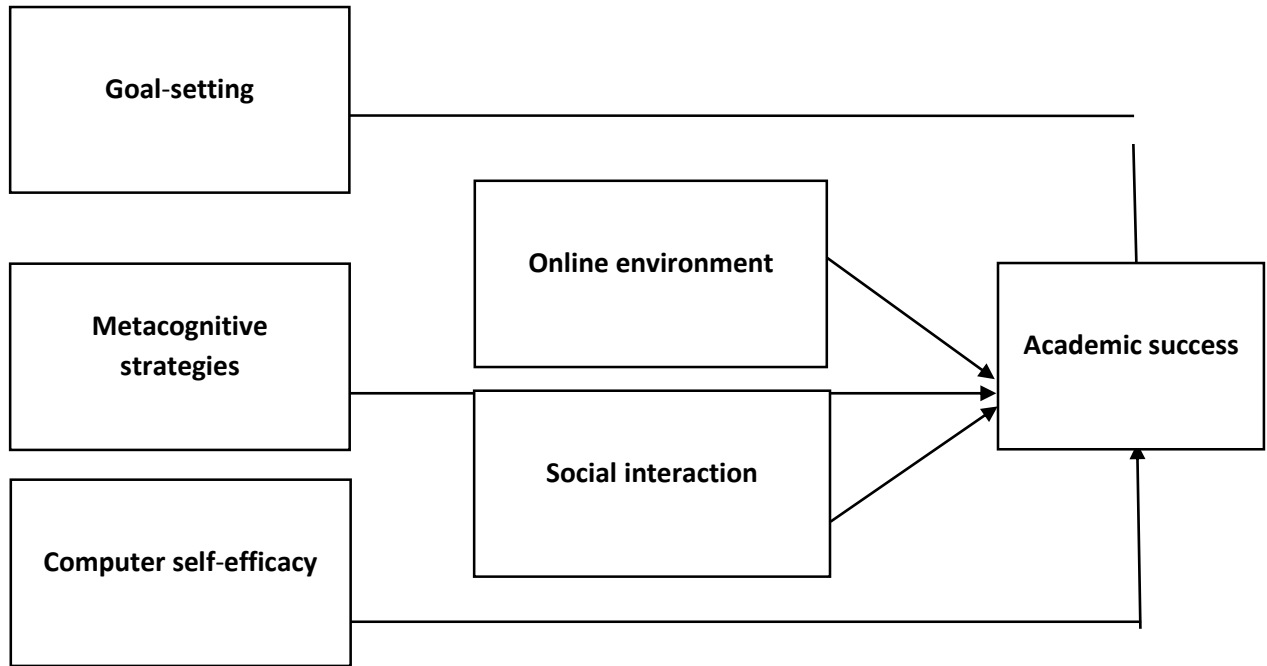


Fig. 1 Conceptual Model

CHAPTER # 3

Methodology

3. Methodology

3.1 Research purpose

The central purpose of research is to strengthen the understanding of our society by the development of new ideas or the progression of existing thoughts. There are three most commonly used types of research purpose: exploratory, descriptive, explanatory.

EXPLORATORY: As the name implies, researchers use this study to achieve knowledge with an already existing idea that is not precisely described before, implemented in the initial stages. In later times, a more comprehensive study can be managed on it.

DESCRIPTIVE: The safe and less time consuming research that defines the problem and how, when and, where did it happen rather than why. The purpose of this research is to determine how an aspect fits in the research problem and what its link to it is.

EXPLANATORY: This is the type of research you do to cover the 'why' aspect in a precise manner on an already researched topic explaining the problem thoroughly. It is conducted in the later stages of the decision-making. The objective of explanatory research is to check its accuracy. Some of its designs include Literature research, In-depth of every specific problem, and, Case analysis.

In our research, we are applying an explanatory purpose. It is because we are doing our research to enhance our perception of a previously acknowledged base paper. Our purpose is to study factors influencing the acceptance and, adaption of university students to use mobile learning applications in higher studies in Pakistan.

3.2. Research approach

The research approach is a plan of action for research that spans the steps from hypothesis to elaborative methods of data collection and interpretation. They are classified into Quantitative, Qualitative and, Pragmatic approaches.

The Qualitative approach benefits the researcher to know the thinking of participants and the reasons behind it. It usually includes open-ended questions and the collection of non-numerical data. Examples include case-study, one to one interview. The Quantitative approach uses a

systematic way of analyzing data in numerical form. It comprises close-ended questions. Examples are experimental designs, surveys. Pragmatic approach is also called the mixed approach because it is a combination of both qualitative and quantitative approaches. An example is a multiphase and transformative. Our approach to the research is Quantitative. As we collected data through a representative survey of 500 participants and converted it into a numerical form. We applied an analytical technique to study the association between dependent and independent variables

3.3. Research Design

The research design is the structure that we select to interpret various elements of a study in a coherent way. It allows the exact evaluation of the cause-effect connection of dependent and independent variables. The design we chose for our research is a correlational research design. This is mostly the design we use with the surveys. Correlational research is a kind of research design that helps us to examine two variables to find a statistically corresponding link between them. It aims to identify variables that have some sort of connection to the extent that a shift in one affects the other without the researcher managing either of them. In our research, we are trying to find how our three independent build affect academic success. As for the dependent variables, we want to investigate their role in educational success.

3.4. Sampling Technique

A sampling technique is a way of selecting individual people or a subset of the population to make statistical conclusions from them and determine characteristics of the entire population. The sampling technique we use for our research is convenience sampling. It is a kind of non-probability sample. As the name suggests, it is normally sent to a group of people, the researcher could easily get in contact with. There is no requirement for additional data. We used this technique because it was cost-effective, quick data collection, less time investment to create samples. We didn't have to run around for data collection and, easily send it to the community we had access to.

3.5. Target audience/Population

A target audience is a segment of the population who has a special opportunity to act on the problem you've identified or who is personally affected by the problem.. Our target audience is the students of Pakistani university, which nowadays is relying on e-books. In these COVID times, books are not always accessible. This research would help people who have not ever read e-books to give it a try.

3.6. Sample size

For this research, our sample size is based on 205 people and the result is based on 205 responses from different university students of Pakistan.

3.7. Statistical techniques

We are using Statistical Package for Social Sciences (SPSS) and Partial Least Square (PLS) software. The statistical techniques used were descriptive statistics and structural equation modelling. Reliability analysis, Factor analysis and, Regression analysis are some of the tests that has been applied to obtain results

3.7.1. Reliability analysis

It refers to when two observations under consideration that are similar to each other in terms of the construct being measured also have a similar outcome. It allows us to check the consistency of questions

3.7.2. Factor analysis

It minimizes the bulk number of variables into a small number having an identical response pattern.

3.7.3. Regression analysis

This type of statistical technique allows us to investigate the correlation among two variables of interest. All types of this analysis usually check the influence of a dependent variable on one or more independent variables.

3.8. Questionnaire and Measurement Instrument

The measurement instrument used in this study is a 21 items online questionnaire based on a 5 point Likert scale ranging from strongly disagree (1) to strongly agree (5). Our questionnaire is based on a past study. The variables goal-setting with three-item scale, Metacognitive study with three-item scale, Computer self-efficacy with four-item scale, Online education with three-item scale, Social interaction with four-item scale and, academic success with four-item scale was adapted from study of Puska et al. (2020).

3.9. Ethical consideration

This study aimed to evaluate the influence of e-books on academic success among students of Pakistan. The students were volunteers and questions were only which served the goal of the study. No personal information was received. The demographic data only contains age, gender, and education level.

3.10. Demographics

The respondents' demographic information is displayed in Table 1, which shows that 47% of the sample is male, and 53% is female. The table further shows that most of the respondents fall under the age bracket of 18–22 (34% of the sample). In term of education, 34% of the respondents were “graduates”, meanwhile 35% were “undergraduate”, and 20% were “post-graduates. The table further shows that the majority of the respondents monthly income fall under the Rs. 25,000 – 40,000(31% of the sample).

Profile of respondents (N = 201)

Table 1 Demographics

Demographics Items	Frequency	percentile
Gender		
Male	94	47%
Female	107	53%
Age		
18-22	68	34%
23-27	67	33%
28-32	49	24%
More Than 32	17	8%
Education		
Undergraduate	70	35%
Graduate	69	34%
Post Graduate	38	20%
Other	24	12%
Monthly Income		
Less Than Rs 25,000	59	29%

Rs. 25,000 - 40,000	62	31%
Rs. 40,000 - 60,000	47	23%
More Than Rs 60,000	33	16%

CHAPTER # 4

Data analysis

4. Data Analysis

The partial least square structural equation modelling (PLS-SEM) technique was employed on the data in this research, which was done with Smart PLS version 3.2.3. (C.M. Ringle et al., 2014). Bootstrapping method of Raza et al. (2020) was applied on subsamples of 201, which provided notable values for every path coefficient. PLS-SEM technique is used because it provides better results for studies having multiple variables used in it (Oliveria et al., 2016; Raza et al., 2019). PLS-SEM technique also has more statistical power as compared with the Covariance based structural equation modeling (CB-SEM) (Raza & Khan, 2021) (Reinartz et al., 2009). PLS-SEM was performed out by following two steps. In the first step, measurement model was evaluated, meanwhile, the second step consists of structural model evaluation (Henseler et al., 2009; Guoyan et al., 2021). Construct validity and discriminant validity is being assessed by the measurement model. On the other hand significance of path coefficients and R^2 is being analyzed through structural model.

4.1. Measurement Model

The convergent and discriminant validity are assessed using the measurement model. Individual item reliability, Cronbach's Alpha, composite reliability, and average variance extracted are all evaluated for convergent validity. Table 2 shows the findings of convergent validity reports, and we can conclude that each reliability Cronbach's, Composite reliability, and average variance extracted (AVE) is greater than 0.5, which is closely related to Fidell and Tabacnick's criteria (2007). According to Fornell and Larcker, the average variance extracted (AVE) explains change in variables, and the requirement would be over 0.5. (Raza & Khan, 2021; Qazi et al., 2021).

Constructs	Items	Loadings	Cronbach's α	Composite reliability	Average Variance extracted
ACS	ACS1	0.970	0.930	0.956	0.878
	ACS2	0.922			
	ACS3	0.918			
CSE	CSE1	0.939	0.924	0.952	0.868
	CSE2	0.932			

	CSE3	0.923			
GOS	GOS1	0.830	0.824	0.895	0.740
	GOS2	0.900			
	GOS3	0.850			
METS	METS1	0.915	0.887	0.930	0.816
	METS2	0.936			
	METS3	0.858			
ONE	ONE1	0.933	0.896	0.935	0.828
	ONE2	0.901			
	ONE3	0.896			
SOI	SOI1	0.929	0.932	0.956	0.879
	SOI2	0.945			
	SOI3	0.939			

Where ACS is academic success; CSE is computer self-efficacy; GOS is goal setting; METS is meta-cognitive strategy; ONE is online environment; SOI is social interaction.

The correlation matrix, cross-loading, and heterotrait-monotrait ratio of correlations (HTMT) criteria were used to assess discriminant validity. The square root of AVE (cross-diagonal values) is higher than the off-diagonal component, as shown in Table 3, which fits Fornell and Larcker's requirements (1981) and Ali and Raza (2017). The square root of AVE, according to them, should be greater than the correlation of two latent variables (Raza et al., 2017; Qazi et al., 2021).

Table 3 Summary statistics.						
	ACS	CSE	GOS	METS	ONE	SOI
ACS	0.937					
CSE	0.623	0.931				
GOS	0.641	0.684	0.860			
METS	0.584	0.507	0.618	0.903		
ONE	0.633	0.501	0.439	0.595	0.910	
SOI	0.508	0.410	0.365	0.607	0.770	0.938

The findings of loadings and cross-loadings are displayed in Table 4. Besides that, items on every construct are packed with greater values in their corresponding constructs unlike other constructs, and the cross-loading distinction is also greater than the maximum requirements of 0.1, demonstrating which our findings fit the requirements of (Gefen and Straub, 2005) (Raza et al., 2020).

Table 4 Loadings and cross loadings.						
	ACS	CSE	GOS	METS	ONE	SLS
ACS1	0.970	0.632	0.361	0.567	0.521	0.588
ACS2	0.922	0.550	0.345	0.475	0.562	0.537
ACS3	0.918	0.565	0.379	0.597	0.593	0.378
CSE1	0.567	0.939	0.449	0.546	0.576	0.336
CSE2	0.608	0.932	0.463	0.421	0.596	0.236
CSE3	0.563	0.923	0.446	0.379	0.376	0.313
GOS1	0.331	0.349	0.830	0.512	0.319	0.379
GOS2	0.366	0.497	0.900	0.594	0.433	0.415
GOS3	0.293	0.401	0.850	0.479	0.376	0.236
METS1	0.573	0.527	0.577	0.915	0.496	0.522
METS2	0.526	0.677	0.583	0.936	0.479	0.517
METS3	0.477	0.597	0.535	0.858	0.566	0.618
ONE1	0.581	0.451	0.444	0.569	0.933	0.636
ONE2	0.614	0.507	0.424	0.565	0.901	0.227
ONE3	0.526	0.591	0.322	0.569	0.896	0.477
SOI1	0.686	0.589	0.331	0.485	0.437	0.929
SOI2	0.422	0.560	0.300	0.562	0.237	0.945
SOI3	0.548	0.412	0.387	0.516	0.200	0.939

The condition is that the HTMT average value should not be higher or greater than 0.85. As the results are shown in Table 5, HTMT values of no more than 0.85 meet the criteria of 0.85 (Henseler et al., 2015) (Raza et al., 2021) and that is why our result is discriminant validate

	ACS	CSE	GOS	METS	ONE	SOI
ACS						
CSE	0.670					
GOS	0.438	0.553				
METS	0.640	0.544	0.718			
ONE	0.690	0.835	0.505	0.673		
SOI	0.588	0.724	0.406	0.668	0.846	

4.2. Structural Model

The PLS-SEM algorithm is used to analyse the structural model, and the results are shown in Table 6. Each path represents a different hypothesis. Hypotheses are used to test the relationship between the independent and dependent variables. Table 6 gives the coefficient values for the experimental method of hypothesis in this Standardized regression weights (SRW) table. The regression method is used to show how product equity has a direct effect. This graph depicts the influence of independent variables on the dependent variable. It has a P value that establishes the hypothesis' importance; if the P value is less than 0.1, the hypothesis is accepted; otherwise, it is rejected. The structural model's explanatory power is measured by the amount of variance in the dependent variable explained by the value of R2 (Raza et al., 2021) and (breiman and friedman, 1985).

Therefore, all the hypotheses developed in this study were accepted, except H1 and H2, which were rejected.

Hypothesis	Regression Path	Effect type	SRW	Pvalue	Remarks
H1	CSE -> ACS	Direct effect	0.097	0.635	Not Supported
H2	GOS -> ACS	Direct effect	0.062	0.304	Not Supported

H3	METS-> ACS	Direct effect	0.065*	0.070	Supported
H4	ONE -> ACS	Direct effect	-0.069*	0.054	Supported
H5	SOI-> ACS	Direct effect	0.730***	0.000	Supported

Notes: SRW = Standardized regression weight.

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$.

4.3. Discussion of the results

H1, H2, H3, H4, and H5 are the five hypotheses we explored. The results are shown in Table 6. The outcome demonstrates good model fitness and structural model, as well as support for three of the five hypotheses.

The H1 is linked to academic success and computing self-efficacy. The link between them has been discovered to be positive but insignificant ($\beta = 0.097$, $p > 0.1$), thus rejecting the H1. The studies which supported that relationship includes Cassidy, S., & Eachus, P. (2002) and Abulibdeh, E. S., & Hassan, S. S. S. (2011). Students believe in their talents, and they are confident in their learning and the things to be learned, according to the results. As a result, it is stated that students who are computer self-efficacious have a more positive experience while studying and learning, which can lead to improved academic success.

The H2 is linked to academic success and goal-setting. The link between them has been discovered to be positive but insignificant ($\beta = 0.062$, $p > 0.1$), thus rejecting the H2. This result is consistent with the prior study of Moeller, A. J., Theiler, J. M., & Wu, C. (2012) and McMillan, J. H., & Reed, D. F. (1994). As the research indicates, goal-setting had a positive impact on the motivation of students and academic achievement. The result implies that Across a variety of grade levels, subject areas, and studies, effective goal-setting practices help students focus on specific outcomes, encourage them to seek academic challenges, and make clear the connection between immediate tasks and future accomplishments (Stronge & Grant, 2014).

The H3 is linked to academic success and metacognitive strategy. The link between them has been discovered to be positive and significant ($\beta = 0.065$, $p < 0.1$), hence H3 is accepted. This result is supported by past studies, Coutinho, S. A. (2007) and Işgör, I. Y. (2016). In this approach, it was demonstrated that metacognitive strategies have an impact on students' academic success when using e-learning. As a result, metacognitive tactics enable pupils to reflect on their own thinking. The ability to control their own learning is enhanced when they are aware of the learning process. It also improves one's ability to self-regulate and manage one's own learning motivation.

H4 is linked to academic success and the online environment. The link between them is discovered to be negative but significant ($\beta = -0.069$, $p < 0.1$), H4 is accepted. The relationship between online environment and academic success is consistent with previous study Broadbent, J. (2016) and Erdogdu, F., & Erdogdu, E. (2015). Based on the results of the study, it can be stated that some students lack the discipline required to manage their progress in online classes, which could negatively affect their academic success. According to the survey, e-learning allows students more time freedom. E-learning, according to the research, allows students better manage their time and encourages them to learn on their own.

H5 is linked to social interaction and academic success. The link between them has been discovered to be positive and significant ($\beta = 0.730$, $p < 0.1$), H5 is accepted. The result is consistent with the previous studies of (Kořuh et al., 2015) and Purkey, W. W. (1970). According to the findings, students' interactions with other students and teachers are critical for academic performance. Students gain important information through social interactions, which helps them understand particular things more readily and achieve better achievements during their studies. Furthermore, students in all classes believed that social interaction helped their learning by improving their reading and teaching knowledge, as well as their critical thinking and problem-solving skills.

CHAPTER # 5

Conclusion and

Recommendations

5. Conclusion and Recommendation

5.1. Conclusion

The research topic is factors that affect e-learning satisfaction among university students. A gap that has been identified is that there are numerous research that have been conducted in first world countries but limited study is accompanied in Pakistan, though the less number of researches that have been accompanied on student perception of e-learning so this research is going to fill this gap by conducting research in Karachi, Pakistan. Explanatory research has been used as the research purpose is constructed on a developed principle and clarifies the relation between independent and dependent variable. Independent variable are computer self-efficacy (CSE), goal-setting (GOS), meta-cognitive strategy(METS), online environment (ONE) and dependent variable is academic success (ACS). . The cause behind these studies is to discover the effect of perceived satisfaction of e-learning in university students. This research approach that has been followed in quantitative research, and correlation research designed is used because we are finding relation between two or more variables. The target people of this study are all students that which are using e-learning with in Karachi city, and the sample size that have been taken is 201 respondents using questionnaire based on likert scale from (1) strongly disagree to (5) strongly agree. The data has been examine through IBM SPSS statistics (statistical package for social sciences) and PLS- SEM (Partial Least Squares Method to Structural Equation Modelling). The three main test that have been performed in this research is reliability evaluation, factor evaluation and regression evaluation. The effects of reliability analysis shows the overall data is reliable. The results of factor analysis shows that all variables have high connection with their corresponding variables as the value is greater than 0.7. And as per regression analysis, it shows that 2 variables have a significant and positive impact and computer self-efficacy and goal have an insignificant and positive impact moreover online environment have negative but significant impact

Total five hypothesis that have been proposed in this research were, the positive relation between goal setting, computer self-efficacy, metacognitive strategy, social interaction with academic success, three out of five hypothesis got accepted but the finding shows that relation between goal setting and computer self-efficacy on academic success got rejected in this research.

5.2. Managerial implication

Based on the findings, we believe that student engagement in E-learning is critical and that it will be more successful for them to use E-learning. The vast majority of students favoured online learning. To improve the effectiveness of learning, we ensure that students prefer recorded classes with a quiz at the end of each class, based on content analysis. This should also be incorporated into e-learning. Students like online classes because they are flexible and convenient, but wireless networking issues in rural areas create difficulties for students to participate in online learning.

As we all know, online learning has been a popular option for students due to its flexibility, and more online courses are being tailored to meet the needs of students. The world system is shifting to an online system, and education sectors are figuring out how to give education via online platforms. They create many web portals to deliver online education to students all around the world.

According to our findings, effective communication needs the ability to explain thoughts and express ideas through oral, writing, visual, and nonverbal communication abilities, as well as listening skills to obtain comprehension. The ability to communicate in person, in writing, and in a digital environment. It aids students in remaining engaged and developing a greater sense of self.

Similarly, self-regulated skill suggestions state that students should consider learning as an activity that they engage in on their own time. Goal planning, self-monitoring, self-instruction, self-reinforcement, and time management are examples of self-regulation abilities that keep students engaged in online education.

Furthermore, this study recommends that, in the learning environment supported by online learning tools. Students' attitudes are defined by what they think, feel, and do in response to an attitude object. Their attitude attracts their attention and encourages them to participate in online learning. Students' traits and attitudes, which were regarded as crucial aspects in online learning in poor countries, were found to have a significant impact on online learning, engagement, and adoption in this study.

In addition, sense of presence is maintained as the online portals display the view of classroom to engage students, where students can interact with each other, leave comments, ask questions and make their mind present, engaged and involved throughout the online session.

At last, our recommendation for sense of identity is that student faces and confronts his abilities and hurdles in classroom which resist student's engagement, now as in online education system it provides an environment like classroom where students feel like interacted and engaged through the session, and it helps them to polish their skills and remove their traits that should be removed in order to grow their personality.

5.3. Future Recommendations

In this research, we have limited it to only Karachi, future researchers can extend it to different cities and also to different countries, moreover we have limited the sample size to 201 respondent, researchers can extend sample size. We have only used goal setting, Meta cognitive strategy, online environment, social interaction and academic success as variables, researchers can do research on different variables. We have done our research on general purpose, future researchers can target specific institutions for their research.

CHAPTER # 6

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