



Teaching Mode Of MBA Education In Universities Based On The Perspective Of Internet

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ABSTRACT

E-learning is accomplished through the combination of modern education and information technology, and it plays a crucial role in fostering educational equity. Achievement of student in online learning is very difficult. Therefore, It is necessary to identify those factors which affect the student achievement in online learning. The aim of this study is to investigate the impact of online teaching on student achievement. the study further explored the mediating role of readiness for online learning, motivation and ease of use and moderating role of student engagement. Data was collected from 410 students from MBA program. Questionnaire was adapted from previous studies to collect data. Data was collected by using simple random sampling technique. Items of each variable was measured on 5-point Likert scale. Data was analyzed by using SPSS and smartPLS software. The findings of data showed that online teaching has a significant effect on student achievement. Furthermore, readiness for online learning, motivation and ease of use significantly mediates the relationship between online teaching and student achievement. Student engagement also moderated the relationship between online teaching and student achievement. The findings of the study will help student and educational institutes to enhance the student achievement. Further studies can use other variables which can enhance the student achievement in online learning.

Keywords: Online Teaching, Student Achievement, Motivation, Readiness for Online Learning, Ease of Use, Student Engagement

1. Introduction

The development of information and communication technology has emerged as a significant driving force in the evolution of educational institutions all over the world. The pandemic was a significant factor that contributed to the transition of traditional physical classroom settings toward the adoption of information and communication technology (Kumar, 2021). The research suggests that students have a far higher level of happiness when they are learning in settings that incorporate information and communication technologies. As a result, we need to maintain our interest in learning environments that are centered on technology (Dwijuliani et al., 2021). It is abundantly clear that technology has had a significant effect on the online lives of young people. Students who are addicted to technology can find common ground in their educational goals and interests thanks to the digital revolution. In summary, COVID-19 has given us the chance to take advantage of online learning, which is becoming increasingly important as educational systems strive to keep up with the rapid development of new technology. The application of information and communication technologies, which have an impact on all aspects of human existence, is also actively being incorporated into the field of education. Due to both individual and societal considerations, the use of technology into educational settings has become unavoidable in light of recent advances (Kusuma & Hamidah, 2021). Teaching students over the internet encourages them to make use of the many different learning methodologies available to them, which in turn raises the students' degree of dedication to the study of their chosen fields of study. The virtual world is an excellent learning environment that provides its users with information acquisition based on their own personal experiences. The outcomes of the course are established by the instructors through the creation of

assignments that involve problem- or challenge-based learning situations and the provision of full control of exploratory learning experiences to the students (Ma et al., 2021).

It is vital for a higher education institution to be prepared for emerging technologies in order to achieve the desired results in areas such as increased productivity and anticipated benefits (Küsel et al., 2020a). Studies conducted by Martin, Stamper, & Flowers, (2020) that investigate students' readiness for using items supported by technology and the consequences of this variable on the students' actions. In this study, the term "e-readiness" was referred to using the concept of "readiness for e-learning." Students should be able to have control over their own learning activities and make their own decisions regarding the scope and depth of content, the type of media accessed, and the amount of time spent on study when organizing learning activities in e-learning processes in order to enable greater flexibility (Kumar, 2021). In this regard, the aspect of student control, while at the same time the level of preparation of the student, is considered to be a significant component of e-learning.

When it comes to people, motivation is determined by how they are treated as well as how they feel about the task that they accomplish. Students desire to participate actively in the classroom because they view themselves as partners in the process of learning. It is a pattern of conduct that the educator ought to strive to instill in the students. The individual educational requirements of each student in the class ought to be thoroughly understood. There is a strong correlation between the unfavorable aspects of the student's learning environment and the student's unfavorable conduct and academic performance. If the individual learning requirements of the student are understood, it is possible to fashion a classroom setting that is more conducive to productive education. It is well-established that motivation is a significant factor in determining academic success since it invigorates and guides behavior toward the accomplishment of goals.

In response to the rapid development of technology, researchers have undertaken studies on what is known as the Technology Acceptance Model (TAM). The Technology Adoption Model (TAM) is an information system model that analyses an individual's readiness and adoption of new technological advancements, particularly focusing on the perceived utility variable and the perceived ease of use variable. When deciding whether or not a person is ready to use an information system, crucial considerations include how valuable the system is regarded to be and how easy it is perceived to be to use. Students are more likely to be interested in a social media network if it provides a high level of both ease of use and benefits. It is possible to draw the conclusion that the use of social media networks as educational tools influences perceptions of how easy they are to use and how effective they are (Ogbonnaya, 2019). In addition, Hanham, Lee, & Teo, (2021) found that there is a connection between the perceived usefulness of a tool as well as the reported simplicity of using that tool and the performance of the students who used the tool.

In order to gain a better understanding of how a student will behave in relation to the teaching and learning process, one of the most essential concepts that can be used is student involvement. By gaining an understanding of the conduct of students when they are attending academic institutions, one can get a glimpse of the instructional methods and academic procedures that are being utilized at the university (Ingulfsen et al., 2018). The term "student engagement" refers to the degree to which students are actively interested in the activities and assignments associated with their education. This engagement not only appears to affect school changes directly, such as a teacher's professional identity and the positive atmosphere of the school, but it also appears to lead to an improvement in academic achievement among students whose grades have been poor, as well as a reduction in the levels of student dissatisfaction and dropout rates.

In this context it is important to identify the factors which have a significant impact on student achievement in online learning. The aim of this study is to investigate the relationship between online teaching and student achievement. While using technology, it is necessary to investigate how student motivation, readiness and ease of use of technology affect student achievement. Therefore, this study extended the literature by exploring the mediating role of motivation, readiness and ease of use of technology. This study further explored the relationship between online teaching and student achievement by utilizing student engagement because when students are engaged in any activity they perform better.

2. Literature Review

2.1 Online Teaching

Online learning refers to education that is delivered through the internet using a range of information and communication technologies. Its spectacular growth, especially in the realm of higher education, is largely related to the availability of tools for online education and the support offered for students, teachers, and the institutions that employ them. (Hofer et al., 2021). In view of the financial realities that face the higher education industry as a whole, it is strongly recommended that educational institutions and students continue to make use of online learning.. The traditional learning procedures of the past have been modernized to incorporate online training during the COVID-19 lock down. Academic institutions were subjected to a great

degree of pressure in order to convince them to undertake the work. The academic world needs to become accustomed to the novel instructional strategies of online learning. (Janse van Rensburg, 2018). Even though it is terrible, the fact that educational facilities across the world have been forced to close as a result of the COVID-19 outbreak gives a large opportunity window for the advancement of education procedures. Blended learning needs to be implemented into the curricula of professional educational institutions in order to improve the overall quality of the learning environment. Blended learning combines face-to-face instruction with online and offline activities. (Lapitan et al., 2021). Concurrently, the most advantageous aspects of both traditional classroom education and online education need to be improved further.

During the period in which the Internet was blocked, the United Nations Educational, Scientific, and Cultural Organization (UNESCO) offered guidelines to ensure that online learning continued uninterrupted. On the other hand, detractors asserted that online education is difficult to implement because of the challenging economic conditions that exist in nations with a middle-income.. Not only does the closure of educational centers in poor countries have a detrimental influence on learning, but it also has a negative impact on the students' performance on assessments and examinations. This problem is made even worse by the fact that the educational system already has room for improvement. The educators in these countries should be open to making changes and improvements to the educational systems that they are responsible for. In addition, educational institutions have a larger duty to develop online learning systems that are not just free from known vulnerabilities but also commercially feasible.. In despite the fact that this is a difficult task, it may be made less difficult if sufficient time is allotted for it and if the necessary materials are made available to both students and teachers. This will help improve their educational system.

2.2 Student Achievement

The knowledge, abilities, and behaviors that are acquired by any student in any educational environment are what constitutes student achievement, and this is also manifested in the learning outcomes of the students themselves. On the other hand, it is possible to take into consideration that in online learning settings that have been built with the assistance of technical support, there are a number of aspects that will affect student accomplishment. For instance, Olivier, Archambault, De Clercq, & Galand, (2019) found that the ability of students to self-regulate had an effect on the academic accomplishment of those students in online learning environments.

In addition, research has shown that students perform better when they are exposed to e-learning environments that have been thoughtfully created. In addition, Zhang et al., (2021) note that when it comes to online learners, course design and time management are crucial components of successful online learning, whereas a lack of communication and technological problems are complicating aspects for students.

2.3 Readiness for Online Learning

Online Learning readiness is defined by Farid, (1990) as Anyone, regardless of their industry or background, can reap the rewards that come with online education. Kirmizi, (2015) define "The capacity of an individual to increase the quality of their learning via the utilization of multimedia technology and online learning resources: is referred to as online learning readiness. The learner is considered ready for online learning when they demonstrate that they possess the knowledge, abilities, and beliefs that are necessary for studying in a setting such as this. Similarly, (Gratz, 2018) stated that Learners who participate in online courses must possess particular competencies and attitudes in order to successfully navigate the challenges presented by online learning media. In other words, readiness for online learning refers, in a nutshell, to the degree to which an individual or organization possesses the prior knowledge/skills and effective characteristics (attitude, motivation, etc.) required for experiencing online learning in the most effective way possible. Readiness for online learning can be a personal trait or it can be an organizational trait.

Students who have reached a certain level of preparedness are able to contribute to the development of online learning and improve the quality of interaction that occurs inside online learning settings (Rezi Ramadhana et al., 2021). Consequently, in order for applications of online learning to be successful, prior to beginning the process, students' readiness needs to be evaluated. In the event that this evaluation is carried out, it will make it feasible for the goals of building skills in information and communication technology as well as establishing appropriate strategies for online learning to be carried out in an efficient manner.

2.4 Motivation

Within the realm of educational studies, the concept of motivation has been defined in a variety of ways and theorized about in a variety of contexts. In a broader sense, one might characterize motivation as a state of empowerment that induces students to participate in particular activities. These activities, in turn, contain components that are physiological, cognitive, and affective in nature. These components take place inside the activities themselves. Because the structure of an online education program is primarily self-directed, just as it is in the process of traditional classroom settings, motivation is a key aspect of learning in both traditional classroom settings and in online education settings. This is the case even though traditional classroom settings are more prevalent. One of the needs for successful online learning is motivation, which is recognized as one of the requirements. Online learning is an activity that is more autonomous and independent than traditional learning; therefore, motivation is an extremely necessary element for effective online learning in terms of

positive outcome, dropout rate, and qualified learning. A student's level of desire toward e-learning is one of the most important aspects to take into consideration when determining academic progress and level of contentment, as indicated by the well-known study that was conducted by Deci & Ryan, (1985). According to Yu & Singh, (2018), motivation has been identified as an essential component of online learning, and positive connections between motivation and academic success have been discovered.

2.5 Ease of Use of Technology

When we refer to ease-of-use, we are referring to people's perceptions of the amount of work required to acquire accustomed to a new piece of technology or product. (Siron et al., 2020). According to Grover, Kar, Janssen, & Ilavarasan, (2019), A customer's view of a product may be affected by the product's usability. In this situation, the client would rather purchase a uniform product than one whose qualities may vary by area. Customers are more likely to comprehend the specifications and qualities of a standardized product than those of a product with regional variations. This is the fundamental cause of the observed phenomenon. In the case of a standardized product, buyers could learn from their coworkers who are already utilizing the same product or technology, as they are essentially using the same thing. In the case of modified or specialized products, however, customers cannot simply ask their coworkers how to use the technology or product because the one their coworkers are using may differ from the one the client will use. Because of this, every business should do all they can to develop or manufacture a product that can be sold in a variety of nations and essentially has the same requirements in each of those countries. This will make it simpler for customers to become familiar with the product.

2.6 Online teaching and student achievement

According to Mojibur Rohman, (2020), online learning is a beneficial strategy in terms of both the learner's sense of self-efficacy and their academic performance. Dommatt et al., (2022) provide empirical evidence to show that students who spent more time online significantly improved their course marks. Aristovnik et al., (2020) pointed out that online learning is an effective method in terms of both self-efficacy and academic performance. Lapitan et al., (2021) found that student's academic performance was correlated with their usage of online content materials. Dommatt et al., (2022) found that student's computer or internet self-efficacy and motivation for learning exerted a direct, positive effect on their online discussion score and course satisfaction. According to Hergüner et al., (2020), there is a significant but weak positive correlation between the engagement of students in the online module and their performances in the final learning activity; and instructional strategies that facilitate cross-cultural collaborative online learning, such as group work, self-introductions and cultural awareness activity, computer-supported collaborative learning activity, the inclusion of global examples, and internationalized content.

H1: *Online teaching has a significant impact on student achievement*

2.7 Readiness for online learning and student achievement

The readiness for online learning is connected with feelings of contentment and motivation. (Kumar, 2021), as well as with academic achievement. It is reasonable to expect that, in the not-too-distant future, the practices of teaching and learning in traditional face-to-face learning environments, such as classroom teaching, will be comparable to those utilized in online learning environments, with respect to the goals of higher academic achievement outcomes. It is reasonable to suppose that establishing the impacts of learner readiness levels on academic achievement and assessing learner readiness levels will include processes that are analogous to those involved in teaching and learning. When the cost of e-learning in higher education is factored in, it is possible that in the not too distant future, educational institutions of this type will implement online learning strategies on a large scale in order to accommodate students who are enrolled in more than one course at the same time. Only a few studies in the literature examine the relationship between academic achievement/success and the predictive role of online learning readiness and its subdimensions, despite the fact that research on e-learning readiness provides significantly relevant material to the current study. This is because the literature on online learning preparedness is highly relevant to the current study.

H2: *There is a relationship significant between online readiness and student achievement*

2.8 Motivation and Student Achievement

Researchers Kotera et al., (2022) looked into the connections between achievement motivation, academic performance, and attitude among Malaysian university students. Their research sought to establish the relationships between achievement motivation, attitude, and academic achievement in students by conducting interviews and surveys. Their research showed that there is a significant positive correlation between students' levels of motivation and the academic performance of those pupils. In a separate but similar study, Ozen, (2017) conducted research to better understand academic performance among college students based on demographic traits, motivating factors, and different learning styles. The outcomes of their research indicate that there is a considerable correlation between motivational components and the academic accomplishment of students. The primary objective of this project was to conduct research on the success motivation, academic self-concept, and academic accomplishment of high school pupil Wiyono et al., (2022) research investigating high school students' accomplishment motivation and the link between achievement motivation and self-concept and

academic achievement. According to the findings of the studies, there is a positive correlation between youngsters' achievement motivation and their academic performance.

H3: *There is a relationship significant between motivation and student achievement*

2.9 Ease of Use and Student Achievement

Students' perceptions of how easy it is to use an online learning platform could have a role in whether or not they are willing to adopt it as a new method of academic pursuit. When talking about a platform's "perceived ease of use," we ask students whether or not they believe it is easy for them to navigate (. The concept of perceived ease of use, as described by Davis in 1989, is adhered to by the system's ease of use as viewed by users. At a teacher education institute in Malaysia, another study was conducted to evaluate the extent to which students accepted online learning and to identify the elements that influenced this acceptability. This suggests that students' perceptions of e-learning platforms' user-friendliness have a role in determining whether or not they would adopt them. In addition, it was hypothesized that after participating in online face-to-face learning, students would turn to online learning in order to educate themselves on their own. Students are able to more readily participate in online education and access shared curricular materials as a result of this. Perceived ease of use influences students' attitudes toward online learning. A researcher looked into the factors that influence student acceptability of online learning and analyzed how such factors can lead to student intention to make use of the platform. As a direct consequence of this, students did not feel that learning online was an easy process. According to the students, utilizing online educational resources can be challenging. According to the findings of a body of study, the ideas that students hold on online learning and the social influence that is exerted by their referent groups have a substantial impact on the degree to which they want to participate in it. In addition, a student's social influence, perceived ease of use, perceived utility, and attitudes toward online learning can be used to predict the likelihood that the student would engage in online learning (Ramírez et al., 2021).

H4: *There is a relationship significant between ease of use and student achievement*

2.10 Mediating role of motivation

In the context of the COVID-19 pandemic, the adoption of online teaching has become the sole way of spreading information throughout the world, as social separation is the only way to reduce the spread of the disease. However, the motivation of the learners plays a significant influence in the adoption of such strategies. According to Abrami et al., (2011), the term "motivation" often refers to the incentive that leads someone to act on their own volition. According to the findings of a number of studies, one of the most significant factors that influence how well people learn is their level of motivation (Baber, 2020). In addition, researchers have proven a strong correlation between participants' success and achievement in online teaching and their motivation to learn online, which is a positive feedback loop.

There is a wealth of anecdotal evidence to suggest that student progress in online learning can be considerably predicted by characteristics such as motivation, the convenience of usage, quality of online training, and level of preparation on the part of the student. Previous research has indicated that teaching students online has an effect on the level of motivation they feel. A student's level of academic accomplishment is also strongly influenced by their level of learning motivation. Because these studies satisfy the requirement of studying the role that motivation plays as a mediator between online instruction and student accomplishment, the requirement was fulfilled by these investigations.

H5: *Motivation mediates the relationship between online teaching and student achievement*

2.11 Mediating role of readiness for online learning:

Students' readiness is a strong element in the implementation of online learning effectively (Hergüner et al., 2020). Readiness could be researched by evaluating students' knowledge (George et al., 2014), technology skills (Rasouli et al., 2016), technology availability (Kumar, 2021), self-directed learning (Kirmizi, 2015), computer and internet efficacy (Siron et al., 2020), and attitude (*Online Learning amid the COVID-19 Pandemic Students'*, n.d.) in online learning. Online learning readiness is an individual's ability to utilize online learning resources and multimedia technologies in order to enhance learning quality. Meanwhile, Readiness for online learning can be broken down into three categories: 1) students' preferences about the mode of delivery, as contrasted with traditional in-person classroom instruction; 2) the students' level of self-assurance in their ability to learn through the use of electronic communication; and 3) the students' capacity for independent learning. According to Yu & Richardson, (2015), being mentally prepared for online learning is one of the most important factors in successfully completing online classes.

According to the research that came before it, the degree to which students are prepared to participate in online learning determines their level of achievement. Akuratiya & Meddage, (2021) were the ones who made discovered that there is a favorable association between e-learning readiness and performance in online learning. Thus, the following hypothesis is presented:

H6: *Readiness for online learning mediates the relationship between online teaching and student achievement*

2.12 Mediating Role of Ease of Use

The TAM framework was utilized by Nugroho et al., (2018) for their study model. They highlight the fact that the perceived simplicity of use in electronic learning has a favorable impact not only on the acceptability of electronic learning for academic purposes but also on the performance of the student. In addition, Lee, Mendlinger, Lee, & Mendlinger, (2011) argues that both the student accomplishment and the perceived ease of use in e-learning for study in students is favorably related to one another and has a beneficial impact on one another. The researchers Panigrahi et al., (2018) provide statistical data on the beneficial association between the perceived ease of use and online instruction. Additionally, Malureanu, Panisoara, & Lazar, (2021) conducted a study in which they claim the existence of a positive association between the perceived ease of use in online learning and student performance.

H7: *Ease of use mediates the relationship between online teaching and student achievement*

2.13 Moderating Role of Student Engagement

Recently, the concept of student participation has been the focus of a great deal of attention in the academic community, and a variety of definitions pertaining to it have been proposed. The term refers, in a general sense, to the amount of time, effort, and energy that students invest in order to make their education at the university valuable. It is possible to use the term "student engagement" as a stand-in for "how well" or "how extensively" students participate in daily academic life, which includes academic activities such as completing homework assignments, studying for examinations, and attending classes. Researchers are in agreement that students are more likely to get an educational benefit, in the sense that they will pass final tests and/or perform well in their classes, when they are actively engaged in academic activities (Dogan, 2017). According to Mizani et al., (2022), educational institutions frequently gauge their level of success based on the level of academic achievement displayed by their student body. However, in today's world, it is a fact that students are not always actively engaged in their academic work, and the outcomes of their performances frequently do not live up to expectations. The level of student learning and academic achievement is frequently contingent on the manner in which students make use of the various academic resources that are available. According to Jian, (2022), educational institutions frequently gauge their level of success based on the quality of their student's academic performance. One could therefore propose that the more students are engaged in learning activities on both a physical and mental level, the better they will perform in tests and, as a consequence, in the final examinations. This is because students learn best when they are actively involved in what they are doing (Zepke, 2015).

H8: *Student engagement moderates the relationship between online teaching and student achievement*

On the basis of the aforementioned research and hypotheses, the following conceptual model has been developed (figure 1).

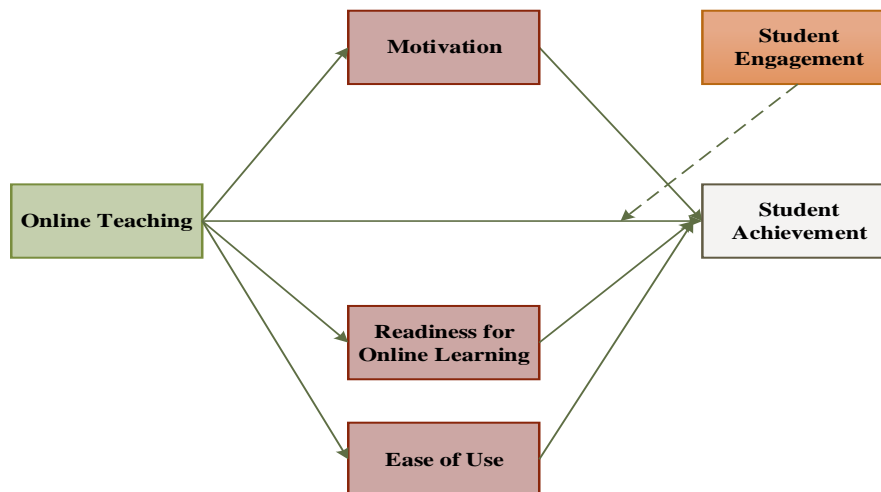


Figure 1. Framework of study

3. Methodology

An approach to research known as cross-sectional surveying was used for the study because it was appropriate for the kind of research topic that had been discussed before. Studies that are carried out in a universe that is composed of a range of components and in which either the entire universe or a specific sample that has been taken from it is utilized in order to create an overall view regarding the universe are examples of these types of studies. Studies that use a cross-sectional methodology are ones in which the progression of development is observed in separate groups that are thought to represent the various stages of development all at once, at a single point in time. This type of research can be done in a variety of settings, including medical research, social science research, and anthropological research. The population of the study consisted of MBA students from

each of China's universities, and they participated in the study. To be more explicit, all of the people who participated in the study were students who were actively enrolled in MBA program at the time of the research. On the other hand, the segment of the population that could be reached comprised of MBA students who possessed internet connection. A total of 800 questionnaires were sent randomly to students enrolled in MBA program. Only 410 of the original 800 questionnaires were considered to be complete enough to warrant further investigation. Questionnaire was divided into two sections. Section 1 contains the demographic information of the respondents such as gender, age, semester, and time spend on the internet. Whereas section 2 contains statements related to the variables of the study. For the analysis of demographic variables, SPSS was used whereas to check the hypothesis Smart-PLS was used.

The replies of the participants were analyzed using a Likert scale with five points, ranging from one (strongly disagree) to five (very much agree) (strongly agree). In this study, variables were measured based on items that had been utilized before. The 7-item scale was used to gauge the overall achievement of the students. The five questions were taken from an earlier study and adapted by Jian, (2022). The phrase "I made myself ready in all of my subjects." is included as an example item. The motivation variable was evaluated using three questions that were modified from Kotera et al., (2022). A sample response might be something like, "I am willing to do the task at a high quality." Five questions taken from a previous study by Borotis et al., (2004) and Küsel et al., (2020) were used to assess students' readiness for online learning. The item "Set goals with deadlines" is included as an example item. The ease of use was evaluated using a three-item scale derived from Hanham, Lee, & Teo, (2021). The statement "I find it easy to use the online learning approach" is included as an example item. The online teaching was evaluated using nine items derived from Rahim, Nesar, Mumtaz, Naeem, & Ali, (2022). One example of a point could be something like, "Having online classes have a favorable impact to our students." A nine-item scale that was adapted from Dixson, (2015) was used to gauge the level of student engagement. "Engaging in conversations online (chat, discussions, email)," for example, may be one of the sample items.

3.1 Demographics information

The demographic information pertaining to the respondents is presented in Table 1. There was a total of 410 respondents, with 200 men and 210 female. 57 respondents were belong to age group of 19-21 years, 47 were from 22-25 year group, 197 were from 26-29 years and remaining 109 having more than 30 years. The current semester of 92 students was 1st whereas 89 respondents were from 2nd semester, 106 were from 3rd and 123 were from 4th semester. Majority of respondents (196) spend 4-8 hours on internet, 71 respondents spend 2-3 hours and 143 respondents spend more than 8 hours on internet. 265 respondents have any work experience whereas remaining 145 have no working experience. Table 1 demonstrate the result of demographic analysis.

Table 1. Demographic profile of the respondents

Demographic item		Frequency
Gender	Male	200
	Female	210
Age	19-21 years	57
	22- 25 years	47
	26-29 years	197
	More than 30 years	109
Semester	1 st	92
	2 nd	89
	3 rd	106
	4 th	123
Time spend of internet	2-3 hours	71
	4-8 hours	196
	More than 8 hours	143
Any working Experience	Yes	265
	No	145

4. Results

In this work, data were analyzed by means of structural equation modelling (SEM), and for the purpose of doing so, partial least squares structural equation modelling (PLS SEM) was utilized rather than covariance-based techniques such as AMOS. The PLS-SEM was chosen because it may be used for either confirmatory or exploratory research, depending on the purpose of the study. Covariance-based (CB-SEM) and partial least squares (PLS-SEM) approaches are what make up structural equation modelling (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). Both methods have their own unique distinctions, such as the fact that the covariance-

based method can either validate or invalidate the theories. PLS-SEM, on the other hand, provides both extensions and advancements in theoretical frameworks. In order to measure the data, Smart PLS 3.3 was utilized. The data was measured in two parts: the measurement, and the structural path. The Smart PLS method is useful for analyzing data that is either extremely complicated or very limited in scope.

The reliability of the model as well as its validity are both components of measurement models. In this study, the validity of the model was investigated using convergent and discriminant validity. Additionally, the Cronbach alpha, composite reliability, and average variance extract were utilized to investigate the model's reliability (Hair et al., 2016). Figure 2 and Table 2 displays all of the reliabilities of the variables that are modelled in this study. To begin, in order to meet the requirements of the Cronbach alpha, it must have a value that is more than 0.70. (Hair et al., 2019). Cronbach's alpha values for this study's model variables are higher than 0.70 overall. For example, the values of IV (online teaching), DV (Student Achievement), Mediators (motivation, preparation for online learning, convenience of use), and Moderators (student engagement) are 0.858, 0.884, 0.883, and 0.876, respectively. These are the values that correspond to the Cronbach alpha threshold that was provided. As a result, all values are acknowledged. In the second step of the analysis, the composite reliability (CR) and average variance extract (AVE) of the model variables are investigated. Both the average variance extract and the acceptable values of the variables for composite reliability are both higher than 0.5, and the acceptable values for the variables are larger than 0.7.

In addition to this, the outer loadings of each variable were examined, and the results can be found in Table 2. When determining the proper outside loadings for objects, a value larger than 0.6 is regarded appropriate (figure 2). Every one of the elements in the variable is more than 0.6.

In addition, the collinearity problem was analyzed using the variance inflation factor in this work. According to the recommendations of the researchers, VIF value below 0.5 are acceptable (Hair et al., 2016). According to Table 2, the VIF values of the study model's core constructs fall somewhere in the range of 1.633 to 3.370. It demonstrates that the VIF values of all of the items are in accordance with the threshold. Therefore, there was no evidence of a collinearity problem in the research model used for this study.

Table 2. Construct Reliability and Validity

			Items	Outer Loading	VIF	Cronbach's Alpha	CR	AVE
Ease of Technology Use	of	EOU1	0.873	1.852	0.851	0.909	0.769	
		EOU2	0.873	2.363				
		EOU3	0.885	2.223				
Motivation	M1	0.909	2.152	0.842	0.904	0.758		
	M2	0.858	1.948					
	M3	0.844	1.947					
Online Teaching	OT1	0.74	2.790	0.898	0.917	0.553		
	OT2	0.638	2.106					
	OT3	0.756	3.370					
	OT4	0.689	2.004					
	OT5	0.726	2.059					
	OT6	0.719	2.467					
	OT7	0.829	2.714					
	OT8	0.789	2.668					
	OT9	0.79	2.678					
Readiness for Online Learning	ROL1	0.895	3.363	0.882	0.918	0.737		
	ROL2	0.855	2.510					
	ROL3	0.869	2.790					
	ROL4	0.814	1.633					
Student Achievement	SA1	0.817	2.580	0.895	0.918	0.615		
	SA2	0.787	2.041					

	SA3	0.796	2.428			
	SA4	0.759	1.837			
	SA5	0.781	2.063			
	SA6	0.833	2.562			
	SA7	0.713	1.814			
Student Engagement	SE1	0.687	1.848	0.912	0.928	0.588
	SE2	0.700	1.803			
	SE3	0.783	3.245			
	SE4	0.769	2.192			
	SE5	0.834	3.227			
	SE6	0.796	2.357			
	SE7	0.784	2.689			
	SE8	0.745	1.996			
	SE9	0.792	2.355			

The Fornell-Larcker criterion and the heterotrait-monotrait (HTMT) test were utilized in order to evaluate the discriminant validity of this study (Hair et al., 2016). The HTMT ratios criterion states that all of the variable values must be less than 0.85 in order for them to be judged appropriate. Nevertheless, HTMT scores as high as 0.90 are sometimes considered appropriate (Hair et al., 2016). The results of this research are presented in Table 3, and it can be seen that all of the values fall within the acceptable range, which ranges from 0.85 to 0.90. The results of this investigation demonstrated that the model being used for this research successfully achieves discriminant validity.

Table 3. Discriminant Validity (HTMT)

	EOU	M	OT	ROL	SA	SE
Ease of Use of Technology						
Motivation	0.288					
Online Teaching	0.470	0.646				
Readiness for Online Learning	0.219	0.826	0.531			
Student Achievement	0.450	0.689	0.803	0.509		
Student Engagement	0.451	0.715	0.840	0.541	0.894	

When the R2 score is greater than 0.5, the strength of the model in the original data is considered to be strong. In this study, the value of R2 for student achievement is 0.698. R2 value demonstrated a strong level of model strength (Hair et al., 2016). In addition to this, the values of Q2 for all of the latent constructs in the models are greater than Zero. It also serves as a model for signs of significance.

Table 4. R-Square values and Q-Square values for the variables

	R ²	Q ²
Ease of Use of Technology	0.174	0.123
Motivation	0.328	0.323
Readiness for Online Learning	0.235	0.156
Student Achievement	0.698	0.399

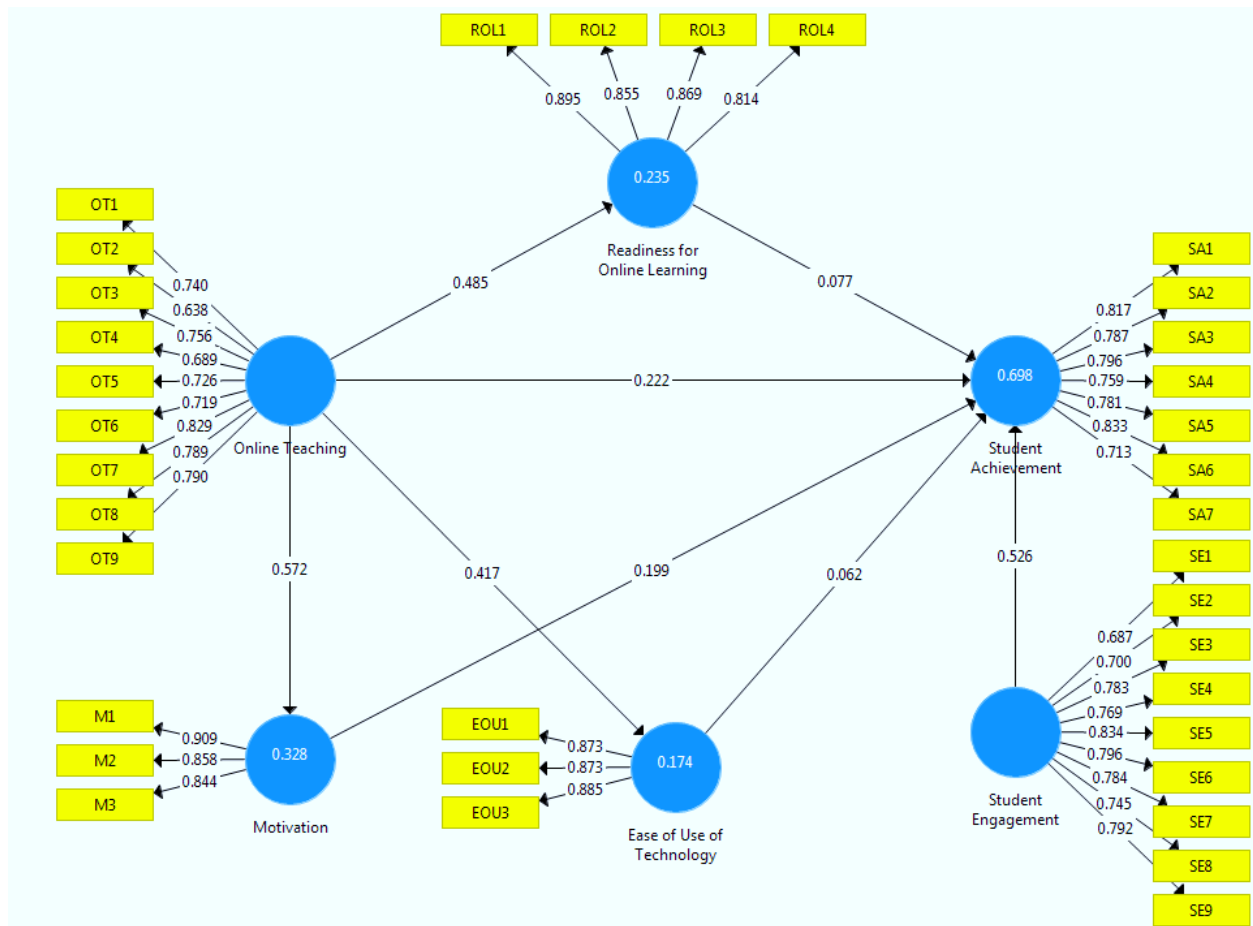


Figure 2. Measurement Model

4.1 Hypotheses testing

For the purpose of doing statistical validation on the model hypotheses, this study utilized a bootstrapping procedure with 500 different samples (Hair et al., 2016). This study looked at “T” and “p” values to determine whether or not to accept or reject the hypotheses (Hair et al., 2016). Figure 3 and Table 5 provides an explanation of the results of the H1 relationship, which predicted a significant effect of online teaching on student achievement. The values of t and p indicate the acceptance of this statement (t = 5.328, p = 0.000). As a result, the H1 gets approved. In addition, the beta value of this hypothesis demonstrated that a change of one unit in the online teaching would result in a change of 0.222 units in student achievement. Second, Hypothesis 2 projected that readiness for online learning would have a significant impact on student achievement. The values of t and p indicate the acceptance of this statement (t = 1.787, p = 0.034). The beta value of H2 showed that for every one unit change in the readiness for online learning, there would be a change of 0.077 units in the student achievement. As a result, the H2 gets approved. Third, the H3 hypothesis hypothesized that motivation has a significant and positive influence on student achievement. Table 5 demonstrates significant findings, as the t and p values indicate that the hypothesis is accepted (t = 3.400, p = 0.000). Therefore, hypothesis 3 is accepted. The beta value of H3 showed that for every one unit change in the motivation, there would be a shift of 0.199 units in the student achievement. According to Hypothesis 4, there is a positive and significant influence of ease of use on student achievement. As a result, the H4 gets accepted. In addition, the beta value of this hypothesis demonstrated that a change of one unit in ease of use would result in a change of 0.062 units in student achievement. The results of all direct hypothesis are shown in figure 3 and Table 5.

Table 5. Direct effects

Hypotheses	Relationship	Beta	SD	T value	P Values	Decision
H1	OT-> SA	0.222	0.042	5.328	0.000	Supported
H2	ROL -> SA	0.077	0.043	1.787	0.037	Supported
H3	M -> SA	0.199	0.058	3.400	0.000	Supported
H4	EOU -> SA	0.062	0.027	2.333	0.010	Supported

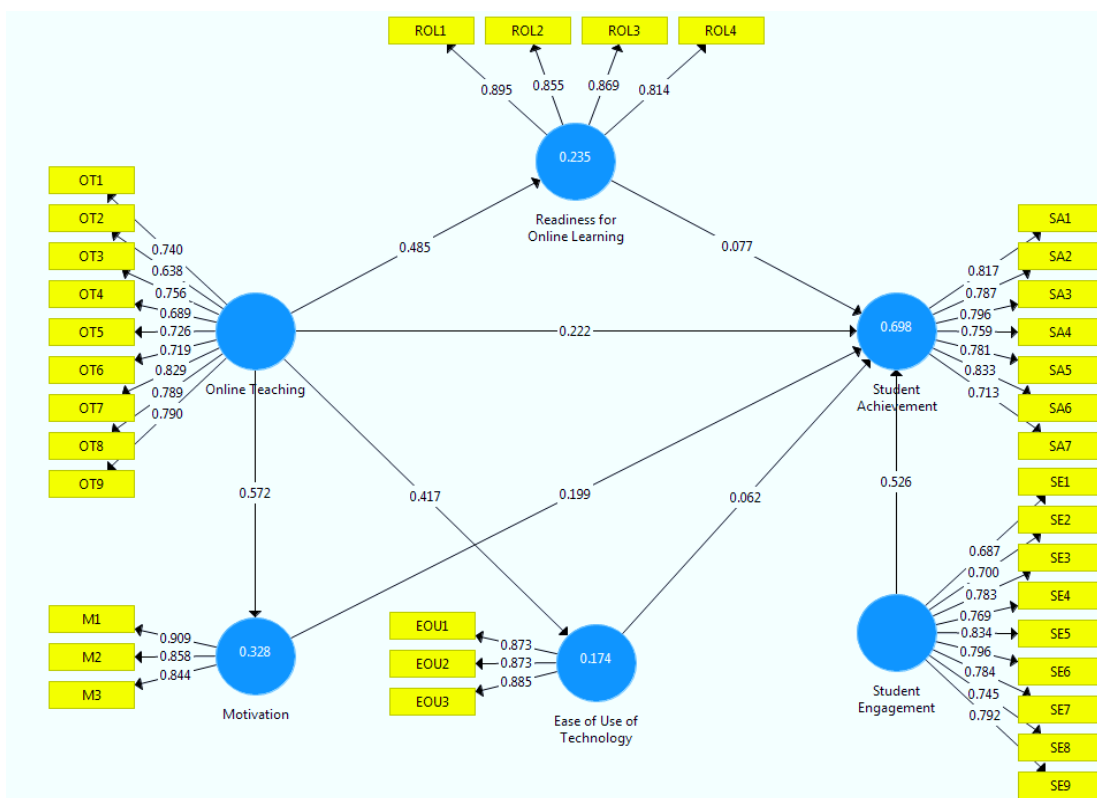


Figure 3: Structural Model

Table 6 shows the mediating effects of readiness for online learning, motivation and ease of use in the relationship between online teaching and student achievement. The result revealed that readiness for online learning partially mediates the relationship between online teaching and student achievement (p=0.045). H5 examined the mediatory effect of motivation between online teaching and student achievement and results revealed that it partially mediates the relationship (p=0.001). Further, results proved that there exists the partial mediating effect of ease of use between online teaching and student achievement (p= 0.015).

Table 6. Indirect Effects

Hypotheses	Structural paths	Direct Effect	Indirect effect	Total Effect	Interpretation	Results
H4	OT -> ROL -> SA	0.222 (0.000)	0.037 (0.045)	0.324 (0.000)	Partial Mediation	Supported
H5	OT-> M -> SA	0.222 (0.000)	0.114 (0.001)	0.324 (0.000)	Partial Mediation	Supported
H6	OT -> EOU -> SA	0.222 (0.000)	0.026 (0.015)	0.324 (0.000)	Partial Mediation	Supported

Moreover, H7 predicted the moderation effect of student engagement between online teaching and student achievement. According to the t and p values of H7 (t=2.901, p=0.002), student engagement has positively moderated the relationship between online teaching and student achievement. It shows that student engagement strengthen the relationship between online teaching and student achievement. Thus, H7 is accepted. Figure 4 and Table 7 presented the result of moderation analysis

Table 7. Moderation effect

	Original Sample	T values	P Values
OT x SE -> Student Achievement	0.082	2.901	0.002

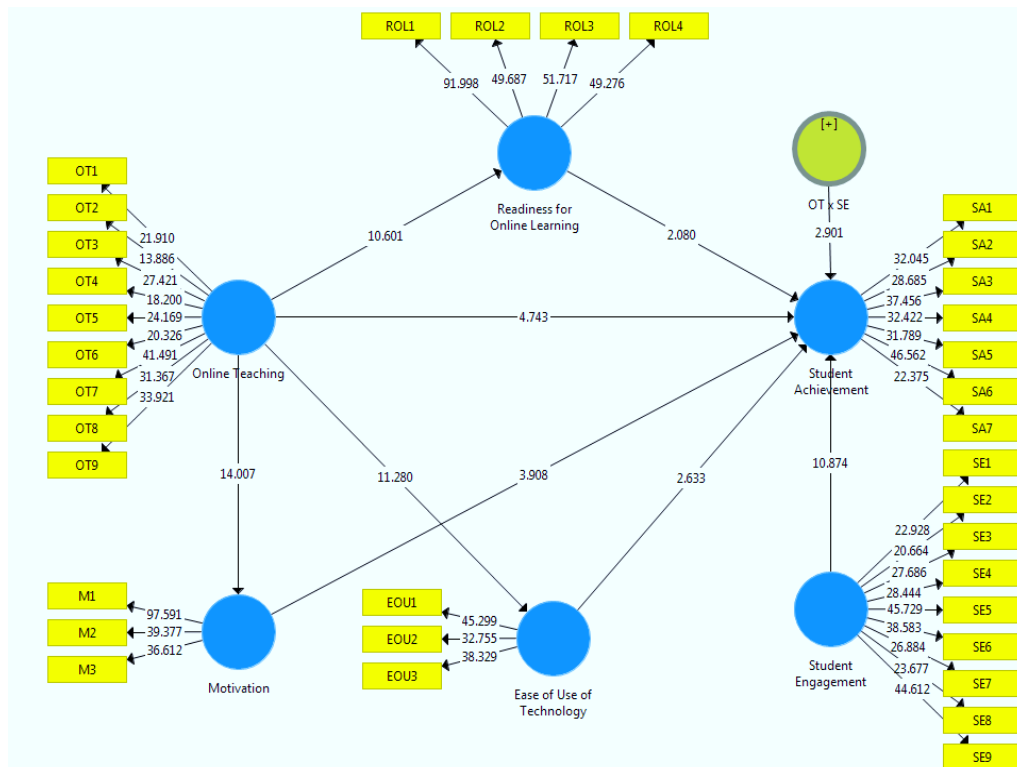


Figure 4: Student engagement as a moderator between online teaching and student achievement

5. Discussion

The aim of the study was to investigate the relationship between online teaching and student achievement. The finding of the study shows that there is a significant relationship between online teaching and student achievement. These findings are aligned with the previous study conducted by Kumar, (2021) and Wang, Shannon, & Ross, (2013) who stated that achievement of student increases when they have online method of teaching. In 21st century, the role of technology increases, and student feel comfortable to learn at their own place. The second objective of the study was to investigate the relationship between readiness for online learning and student achievement. when student are ready to learn online, their performance increases. The finding of current study is supported by these studies and therefore H₂ is accepted. The third objective of the study was to investigate the relationship between motivation and student achievement. Achievement of student increases when they are motivated to learn online (Ozen, 2017). The finding of current study is also aligned with previous studies and hence H₃ is also accepted. The fourth objective of the study was to investigate the relationship between ease of use and student achievement. When student found technology an easy way and feel comfortable to use it, then their achievement in study increases. This support H₄ and therefore it is accepted.

Fifth, sixth and seventh objective of the study was to investigate the mediating effect of readiness for online learning, motivation and ease of use between the relationship of online teaching and student achievement respectively. The findings of the study showed that readiness for online learning, motivation and ease of use partially mediates the relationship between online teaching and student achievement respectively. When the mode of teaching is online and students are ready to learn online, it will increase their achievement. Similarly motivation and ease of use of technology also increases the achievement of student when they are studying online.

The last but not least objective of the study was to investigate the moderating effect of student engagement between the relationship of online teaching and student achievement. When student are positively engaged in online learning activities, their academic achievement increases. The findings of current study is also align with previous studies and hence H₈ is also accepted.

6. Conclusion

The aim of the study was to investigate the relationship between online teaching and student achievement. The study further explored the mediating role of readiness for online learning, motivation and ease of use of technology. Data was collected from 410 students by using simple random sampling technique. The findings show that there is a significant and positive relationship between online teaching and student achievement. The findings revealed that readiness for online learning, motivation and ease of use of technology mediated the relationship between online teaching and student achievement. Data was collected by using questionnaire

which was adopted from previous studies. 5-point likert scale was used to measure the responses. Data were analyzed by using smartPLS software. This study has several practical implications. With the help of this study, educational institutes, policymakers, teachers and students will be aware to know the factors which play an important role to increase student achievement. In general, there are repercussions that can be drawn from these findings for the practise of online instruction within educational settings. When taking into consideration the developments that have been made in information and communication technology in the twenty-first century, it is impossible to overstate how important it is to train educators to be able to instruct students online. Students and instructors alike should be provided with the essential technology skills in order to be able to deal with sudden and unanticipated change brought on by crises and disasters such as COVID-19. In a similar vein, online teaching pedagogies ought to be included in regularly scheduled obligatory programs for teacher professional development in order to give teachers with continuous abilities in online teaching. Additionally, a mechanism should be built to regulate student behaviors during the course of online teaching, in addition to efficiently supervising the students to evaluate their level of comprehension. This should be done in tandem with the development of the mechanism. There are certain limitations to these studies, despite the fact that they have some positive aspects and important contributions. To begin, there is a possibility that the participant's response was influenced by recall bias due to the fact that all of the items were evaluated at the same point. The second point is that the participants were chosen at random. Thirdly, the adaptation scale that was utilized in the study is not domain-specific, which means that it was not designed for the purpose of assessing teachers' capacity to adjust to online education; as a result, it may have less reliability. In conclusion, the findings that were provided were generic and did not differentiate between any sub-groups. In subsequent investigations, comparisons between the different groups can be made.

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