

**RESEARCH PAPER****Inspirational Predictors Influencing the Learner's Intention toward MOOC Adoption and Usage in the Education Sector in Sindh, Pakistan: Extension of TAM Model****¹Masoomi Hifazat Ali Shah, ²Muhammad Irshad Nazeer and ³Faryal Shamsi**

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***Corresponding Author:** hifazat@iba-suk.edu.pk**ABSTRACT**

This study aims to examine factors influencing the learner's perception and expectations regarding the MOOC platform adoption and usage in the education sector in Sindh, Pakistan. Past literature revealed that learning through MOOC is challenging for learners due to the insufficient digital skills, outdated course quality and design, inadequate course evaluation mechanisms, and IT infrastructure compatibilities that meet the traditional classroom to the online classroom setting. For the quantitative approach method, there were sixty-two learners from top institutions were given their initial responses for the reliability analysis. Cronbach's Alpha is declared as reliable since its coefficient Alpha is above or equal to 0.7 using SPSS tool. All the constructs have significance values ranging between 0.792 to 0.924 respectively, which seems to be higher than the Cronbach Alpha coefficient ($\alpha \geq 0.7$). In our analysis, the reliability test ensures evidently that the measurement instrument and data quality are compatible and sufficient. This research will contribute to the strong status of the progressive MOOC platform in education and align its teaching and learning standards that are associated with international standard education.

KEYWORDS: Education Sector, Inspirational Predictors, MOOC Adoption, Sindh Pakistan, TAM Model**Introduction**

Distance education holds significant importance in Pakistan due to the 6th populated country in the world (Afzal, 2009). The Allama Iqbal Open University (AIU) holds the distinction of being Asia's pioneer Open University, established in 1974. AIU employs various mediums for instructional delivery and it boasts a renowned Institute of Educational Technology equipped with radio and TV production capabilities, as well as advanced expertise in computer technology (Jumani et al., 2011). Similarly, The Virtual University of Pakistan (VUP) stands as a distinguished distance learning institution relying on contemporary ICT tools and technologies. It was founded in March 2002 by the Federal Government as a non-profit educational establishment with a clear mission to offer exceptionally affordable, high-quality education to ambitious students across the national and international levels. Presently, the prestigious universities in Pakistan have partnered with MOOC platforms that provide open access the educational content for learners at their doorstep and make diverse communities well-literate.

Massive Open Online Courses (MOOC) is a well-organized learning platform for distance education that aims to deliver well-structured educational courses by adopting information and communication technology around the globe in the future (Wang et al., 2021). MOOC offers a wide range of courses through digital transformation and

facilitates learners to enhance their technical skills, and critical thinking abilities (Kala & Chaubey, 2022). In addition, this becomes a good opportunity for learners to register and learn high-quality education without time, delay, and space constraints (Altalhi, 2021).

Moreover, the learners should be awarded academic MOOC degree certifications that can enhance their sense of achievement and motivation (Javed et al., 2023). The MOOC platforms heavily rely on advanced technologies to streamline traditional education with modernized educational standards to accommodate large numbers of learners simultaneously (Ahmed et al., 2017).

Researchers suggested (Azhar et al., 2023), MOOCs are designed to achieve specific educational objectives while employing various teaching methods, assessment techniques, and technological innovations that play a crucial role in enhancing the effectiveness, usability, and scalability from learners' perspectives. Consequently, it is important to note that MOOCs became widely utilized in the pandemic situation with a combination of face-to-face classes the learners may engage in learning through various categories like online courses, workshops, and practical experiences through digital classroom settings (Javed et al., 2023).

In the light of MOOC literature (Javed et al. 2023; Khan et al. 2018; Azhar et al., 2023), learning through MOOC is challenging for learners due to the lack of digital skills (insufficient digital skills can reduce technological engagement and hinder online learning experiences), course background knowledge (issues related to outdated course design, unclear learning objectives and instructional methods, leads to disengagements of learners) course evaluation (Inadequate mechanisms for course evaluation and feedback may limit learners' ability to express their opinions on the relevance of the courses) and other technological factors such as IT infrastructure facilities that meet the traditional classroom to the online classroom setting.

This can lead to overall MOOCs declining its quality and success in the education sector which ultimately result is a low adoption rate in developing countries like Pakistan (Ahmed et al. 2017). By considering all these challenges there is a need to investigate the inspirational predictors that are influencing MOOC adoption and usage from learners' perspectives in the education sector in Pakistan.

Literature Review

The literature of this study is based on two main pillars that create the structure of the research. These are "The inspirational predictors" and "Technology adoption model". This part of the research has discussed the amended TAM model by adding other constructs related to MOOC adoption and usage from learners' perspectives in the education sector in Sindh, Pakistan.

The Inspirational Predictors

Digital skills (SL)

Digital skills refer to the basic operating skills of a computer system that enable learners to interact with various forms of technology instruments efficiently and ability to access online academic resources (Refi et al., 2019). According to Khan et al., (2022), asserted that learners should realize how the present technology is relevant in their lives and how digital skills are essential to apply in their studies.

On the other hand (Refi et al., 2019), stated that the administration ensures that the learners can access digital instruments such as computers, smartphones, and tablets for learning purposes and motivates them to use technology as a valuable tool for

learning. Moreover, schools and colleges need to arrange workshops to cover topics like using the basics of computers and understanding the essentials of application software that help learners become efficient in common application software (Wahyuningtyas et al., 2022).

Past study revealed by Eshet, (2004), that digital skills enable learners to use software programs effectively and accomplish academic class activities like assignments and quizzes competently in a digital classroom setting.

Course Quality

The course that is delivered to learners must be comprehended with well-defined learning objectives and associated with problem-solving and real-world applications that provide the learners with a clear sense of purpose (Pham et al., 2019).

In the shed of past literature (Aparicio., et al 2019), stated that Some MOOCs may suffer from issues related to course design, unclear learning content, and instructional methods leading to disconnecting learners from the course. Consequently, poor course quality can lead to disengagement, low completion rates, and a negative perception of MOOCs as effective learning tools (Yu et al., 2021).

MOOC instructors' interaction and their instructional methods are highly effective in learners' behavior. It can be highly motivating for learners when the course quality often emphasizes the real-world problems of skills and knowledge when learners observe how what they are learning can be applied and useful in their career development (Albelbisi et al., 2021). The information and knowledge delivered in an MOOC are of high quality when the course learning contents are clear, understandable, and for future use.

Course Evaluation

The course evaluation must be fair in grading and transparent in the quality of feedback provided on quizzes and assignments in the shape of the progress of the learners. Additionally, Course evaluation results indicate how well learners believe they are acquiring knowledge and skills through the MOOC platform (Lundqvist et al., 2020).

According to (Firmansyah et al., 2021) asserted that Inadequate mechanisms for course evaluation and feedback may limit learners' ability to express their opinions on the effectiveness and relevance of the courses in MOOC. Consequently, it may lead to inaccurate evaluation of the learners' knowledge and abilities hindering their academic progress towards MOOC (Tsimaras et al., 2022).

A fair assessment of learners' progress in MOOCs is one of the unique opportunities to shape the quality of their online learning and equitable educational platform.

Technology Factor

MOOCs are entirely delivered online which influences the technology factors to provide a platform for course content, interactions, and assessments that fulfil the academic needs of broad learners to achieve course learning outcomes. Therefore, the technology factor is foundational to the design, delivery, and success of MOOCs in education that enables accessibility, interactivity, personalization, and scalability for making online education widely accessible and effective for learners around the national and international levels (AlQaidoom & Shah, 2021).

Technology factor provides tools for collaborative learning and group work within MOOCs so that learners can collaborate in their academic class activities such as practical projects, participate in discussions, and share resources through online platforms (Ling et al., 2011). Technology factor enables the collection and analysis of data on learner engagement, progress, and performance in MOOC. Data analytics help MOOC providers and educators make informed decisions to improve course design and delivery.

In light of past literature (Karsen et al., 2019) stated that there are around 44 technological factors that influence user's intention to use technologies. Examples of these factors that should be included in the model are "Perceived Compatibility", "Perceived connectivity", "Perceived Cost", "Perceived accessibility", "and "Perceived privacy", excreta.

General Diagram of Technology Adoption Model

The technology adoption model can be described as the "willingness or interest of the individual" towards newly introduced technology adoption and usage. The representation flow of the general diagram of the Technology Acceptance Model is driven in Figure 1. Source (Venkatesh, 2003). Technology adoption models enable researchers to predict individuals' intentions to adopt and use specific IT/IS applications based on their perceptions and beliefs about the technology (Tarhini et al., 2015). In addition, technology adoption models play a crucial role in informing research, practice, and decision-making processes related to the adoption of IT/IS applications.

By offering theoretical frameworks, predictive models, and practical insights, these models contribute to the successful implementation and integration of technology within organizations, driving innovation, efficiency, and competitiveness in today's digital world.

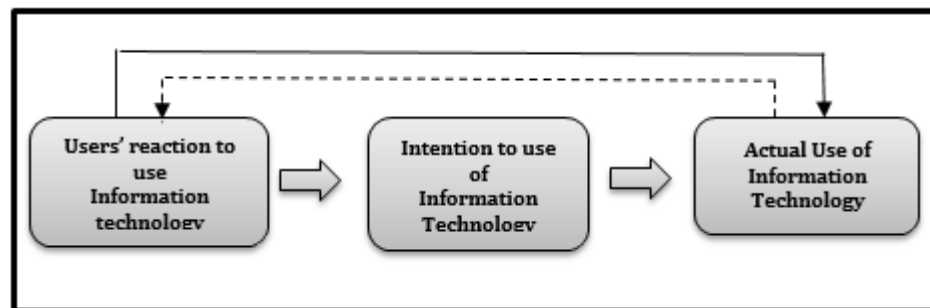


Figure 1 General diagram of the Technology Acceptance Model, Source (Venkatesh, 2003)

MOOC Adoption

MOOC adoption can be referred to as the extent to which educational institutions utilize and integrate MOOC platforms into their curriculum of education through advanced technologies (Granić, 2023). Moreover, The TAM model has demonstrated strong predictive power in explaining and forecasting users' intentions to adopt and use innovative technologies like MOOC platforms. Testing technology applications through the TAM model helps identify potential barriers to adoption and usage early in the development process.

By collecting feedback on users' expectations and attitudes towards the online educational platform, the researchers can identify and contribute the usability issues,

concerns about usefulness, or resistance to change that may impede adoption. (Albelbisi et al. 2023)

Technology Acceptance Model (TAM)

The Technology Acceptance Model (TAM) is composed of five predictors that affect users' intention to adopt and use the actual system, the original predictors are "Attitude", "Perceived Usefulness", and "Perceived Ease of Use" emphasized by Davis, (1989). TAM is the most prominent and cited model used by research scholars who are researching to understand individuals' behaviour to adopt newly introduced technology (Chasul & Nirban, 2014). The model predicts the intention of the user's perceived usefulness and perceived ease of use on the attitude towards innovative technology.

In the recommendation by researchers (WU & Chen, 2017), several studies have proven that these two indicators are the strongest variables for predicting individuals' intention to use technology acceptance. Attitude predictors observe the positive or negative perception of the individual's intention to adopt the new technology as predicted by perceived usefulness and perceived ease of use. Then, the Intention predicts the actual technology usage. Abdullah & Ward, (2016), In their recommendation, determined the positive effect of perceived usefulness and Perceived ease of use on the attitude in the context of actual system adoption. According to (Sun et al., 2008; Cedillo et al., 2018; Abdullah & Ward, 2016), many researchers provide similar definitions of ATT, PEOU, and PU towards the adoption of Newly introduced technology. In the figure 2. Shown the complete logical diagram of the TAM model, source (Davis, 1989).

PU reflects users' perceptions of the educational value, relevance, and effectiveness of MOOCs in supporting their learning objectives. Users may perceive MOOCs as useful if they believe that participating in MOOCs will help them acquire new knowledge, develop skills, advance their careers, or fulfill academic requirements (Wu & Chen, 2017; Al-Adwan, 2020).

PEOU reflects users' assessments of the ease with which they can navigate through course materials, interact with online resources, and engage in learning activities. Users are more likely to adopt MOOCs if they perceive them as user-friendly, intuitive, and accessible, with features that facilitate seamless participation and interaction (Yang & Su, 2017; Fianu et al., 2018).

ATT is the mediating variable between the experience towards the adoption of newly introduced technology which refers to users' overall evaluations and feelings towards participating in MOOCs. Positive attitudes towards MOOCs, characterized by enthusiasm, interest, and willingness to engage with online learning, are associated with greater adoption intentions and active participation in MOOC courses (Wu & Chen, 2017; Abdullah & Ward, 2016).

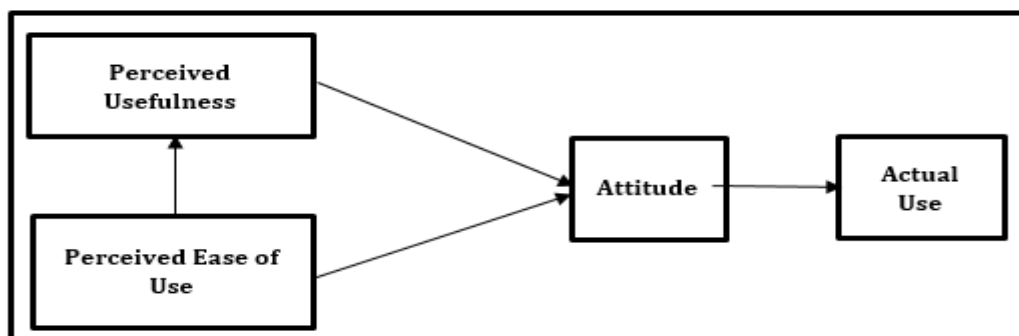


Figure 2 TAM (Technology Acceptance Model), Source (Davis, 1989)

In the recommendation by researchers Table. 1, as shown in the latest past literature, TAM is the most cited and widely used model for technology adoption by applying an amended TAM model to predict a newly adopted technology in the field of IT/IS applications.

Table 1
Authors' recommendations for TAM adoption

Author Name, Publication Year	Article title	Model	Constructs
Pant & Lohani, 2023	Differential Analysis of MOOC Models for Increasing Retention and Evaluation of the Performance of Proposed Model	TAM	PU, PEOU, ATT, BI, Intention to Actual Usage
Rahadiani, et al, 2023	Use of H5P interactive learning content in a self-paced MOOC for learning activity preferences and acceptance in an Indonesian medical elective module	TAM	PU, PEOU, ATT, BI, Intention to Actual Usage
Wang, 2023	The Perception and Behavioral Intention Toward MOOCs	TAM	PU, PEOU, ATT, BI, Intention to Actual Usage
Alyoussef, 2023	The Impact of Massive Open Online Courses (MOOCs) on Knowledge Management Using Integrated Innovation Diffusion Theory and the Technology Acceptance Model	TAM	PU, PEOU, ATT, BI, Intention to Actual Usage

Proposed Research Model and Hypotheses Relationships

This study implements the amended TAM model for technology acceptance adoption by considering its original constructs to validate the research model. The proposed research model integrates external variables that determine the level of inspirational predictors for influencing the learner's intention toward MOOC adoption in the education sector in Pakistan. The research model includes the Intention to adopt MOOC (IDM), which is the dependent variable, the other newly added external predictors are Digital Skills (DS), Course Quality (CQ), and Course Evaluation (CE).

The external predictors are integrated with the original model for identifying the influential impact of learners on MOOC adoption and the other predictors likewise original constructs of TAM namely Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and Attitude (ATT) driven by the influential inspirational predictors. Below are considered the relationship of hypotheses. The research model is illustrated in Figure. 3. Explaining the researchers' proposed model along with suggested hypotheses to achieve research objectives.

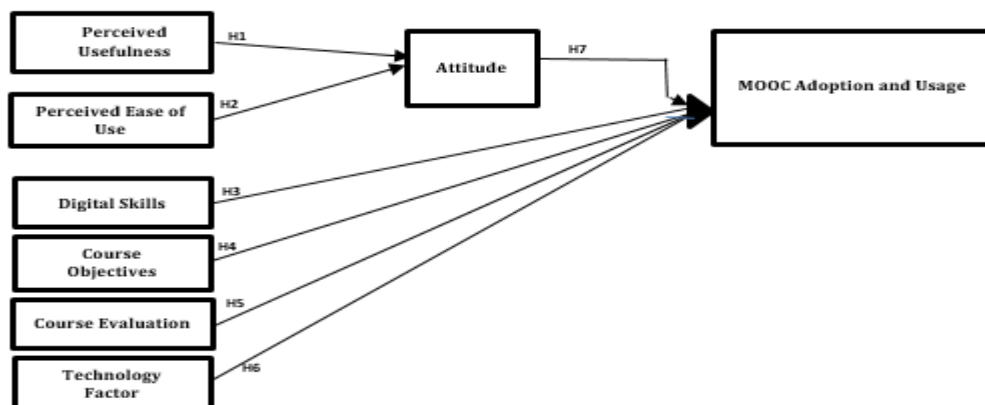


Figure. 3. Proposed Research Model

Hypotheses

H₁: Perceived Usefulness has a positive influence on learner attitude.

H₂: Perceived Ease of Use has a positive influence on learner attitude.

H₃: Digital Skills have a positive influence on the learners' intention toward MOOC adoption

H₄: Course Quality has a positive influence on the learners' intention toward MOOC adoption.

H₅: Course Evaluations have a positive influence on the learners' intention toward MOOC adoption.

H₆: Technology Factors have a positive influence on the learners' intention toward MOOC adoption.

H₇: Attitude has a positive influence on the learners' intention toward MOOC adoption.

Material and Methods

Procedure and Measurement Instrument

The responses were collected from the learners of top institutions from different locations in Sindh, Pakistan. For the quantitative data collection method (Stanley et al., 2005), A survey questionnaire was developed to validate and investigate the hypotheses to attain study goals and determine the major influence of the constructs under examination. This data collection instrument was composed of 47 items overall in two sections. The initial part of the measurement instrument related to the demographic information of the targeted respondents such as gender, age, subjects, academic year, registered courses, etc.

The second part of the measurement instruments addresses the importance of original constructs likewise Perceived usefulness (PU, having four items), and Perceived ease of use (PEOU, having four items), influencing the Attitude (ATT) is a mediating variable. On the other side, the independent variables Digital skills (DS, having seven items), Course quality (CQ, having six items), Course evaluation (CE, having five items), and Technology factors (TF, having five items), with mediating effect Attitude (ATT, having four items) influencing the intention to MOOC adoption and usage (MAU, having five items) is a dependent variable.

Overall, the purpose of the measurement instrument is to validate the research models and suggested hypotheses for achieving the research objectives. This study obtained 62 targeted replies and managed the survey instrument without missing data or outliers to validate the reliability test (pilot testing) to determine the consistency of the measurement instrument using SPSS (Kwak et al., 2017; Purwanto, 2021).

Results and Discussion

Descriptive Statistics (Participants)

A total of 62 responses were collected from the learners who were registered in top public universities from different locations in highly populated cities such as Karachi, Hyderabad, and Sukkur in Sindh, Pakistan.

The demographic information of the targeted participants based on our demographic analysis indicates that the majority of the participants were male 49 number in percent (77.8%), and females 13 number in percent (21.6%). The 55 participants were aged between 18 to 30 years in percent (89.8%), 6 participants were aged between 31 to 40 years in percent (10.2%) and the rest of the age group did not participate. The registered courses were 32 numbers of participants from computer

science in percent (50), 15 participants from mathematics in percent (25), and 15 participants from education in percent (25) the remaining did not participate. In the academic year, 46 participants were from the 1st year in percent (75), and 16 participants from the 2nd year in percent (25), and the rest of the academic year group did not participate. Table 3, illustrates the descriptive statistics of demographic information of the participants.

Table 3
Descriptive Statistics

Demographic Information	Frequency	Percentage of frequency (%)
<u>Gender</u>		
Male	49	77.8
Female	13	21.6
<u>Age</u>		
18-30	56	89.8
31-40	06	10.2
41-50	--	--
More than 50	--	--
<u>Registered Courses</u>		
Computer Science	32	50
Mathematics	15	25
Business Administration	--	--
Social Science	--	--
Education	15	25
Others	--	--
<u>Academic Year</u>		
1 st Year	46	75
2 nd years	16	25
3 rd Years	--	--
4 th Years	--	--

Reliability Test (Pilot Study)

Pilot studies allow you to test the validity and reliability of data instruments like surveys, questionnaires, and measuring tools before performing a final research study. There were sixty-two individuals given the initial responses for the reliability analysis measurements. The Cronbach's Alpha test was used to determine the dependability of the construct items.

Cronbach's Alpha is declared as reliable since its coefficient Alpha is above or equal to 0.7 (Hair, et al, 2013). (MAU, $\alpha = 0.924$), (ATT, $\alpha = 0.902$), (PEOU, $\alpha = 0.918$), (PU, $\alpha = 0.912$), (DS, $\alpha = 0.862$), (CQ, $\alpha = 0.879$), (CE, $\alpha = 0.841$), (TF, $\alpha = 0.792$). All of the constructs have significance values are more than 0.7, ranging between **0.792 to 0.924**, as illustrated in Table 2. The researchers can decide to undertake the final investigation because the significant values for all constructs were reliable.

Table 2
Reliability test Conclusion

Constructs	No. of Items	Cronbach's Alpha ($\alpha \geq 0.7$)
MOOC Adoption and Usage (MAU)	05	0.924
Attitude (ATT)	04	0.902
Perceived Ease of Use (PEOU)	04	0.918
Perceived Usefulness (PU)	04	0.912

Digital skills (DS)	07	0.862
Course Quality (CQ)	06	0.879
Course Evaluation (CE)	05	0.841
Technology Factors (TF)	05	0.792

Conclusion

MOOC is a web-based platform targeting a broad range of learners to deliver high-quality education in partnering with the education sector in Pakistan. MOOC offers a wide range of courses through digital transformation and facilitates learners to enhance their reading, writing, technical skills, and critical thinking to achieve lifelong success.

The past research study of MOOC revealed that learning through MOOC is difficult for learners which can be attributed to numerous challenges, including a lack of digital skills, course quality issues, shortcomings in course evaluation, and various technological factors that undermine the quality performance and low adoption of MOOC from learners' perspectives in the education sector in Pakistan. Therefore, this research aims to examine the significant impact of inspirational predictors influencing the learner's intention and understanding of the learners' expectations toward MOOC adoption and usage in the education sector in Pakistan.

Consequently, the study utilized the amended TAM model which is the widely used model for the adoption and usage of IS/IT applications. This study has adopted a quantitative approach method for collecting the data from targeted respondents to validate the research model to achieve research outcomes. Sixty-two learners from top universities were given their initial responses for the reliability analysis.

The Cronbach's Alpha test was applied using SPSS software to determine the reliability test conclusions. (MAU) five items ($\alpha = 0.924$), (ATT) four Items ($\alpha = 0.902$), (PEOU) with four items ($\alpha = 0.918$), (PU) with seven Items ($\alpha = 0.912$), (DS) with four Items ($\alpha = 0.862$), (CQ) with four Items ($\alpha = 0.879$), (CE) with four Items ($\alpha = 0.841$), (TF) with four Items ($\alpha = 0.792$). Reliability test analysis ensures evidently that the measurement instrument and data quality are compatible and sufficient. The researchers to move on with confidence in their upcoming studies.

The inspirational predictors are Perceived usefulness (PU), and Perceived ease of use (PEOU), influencing the learners' Attitude (ATT) which is a mediating variable. Digital skills (DS), Course quality (CQ), Course evaluation (CE), Technology factors (TF), and Attitude (ATT) are considered significant factors influencing the learners' intention toward MOOC adoption and usage (MOU). This research will contribute to the strong status of the progressive MOOC platform in education and align its teaching and learning standards that are associated with international standard education.

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