



Article Exploratory Students' Behavior towards Massive Open Online Courses: A Structural Equation Modeling Approach

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Abstract: Since the evolution of massive online open courses (MOOCs) as an Ed-Tech solution to various educational problems, learners have registered themselves for various MOOCs offered by various universities and MOOC platforms. However, it has been observed that many learners who register need to complete the course and progress further. Thus, the present research aims to study the learners' lack of continuance of MOOCs. The research is based upon a quantitative research design in which a conceptual model is developed and tested empirically by employing a survey questionnaire as a tool for data collection. The data was collected from 377 respondents who were university students from Saudi Arabia studying at Jazan University, and partial least square-structural equation modeling (PLS-SEM) was used as a tool for data analysis. The results of PLS-SEM show that learner continuance behavior depends on three elements: perceived career success, perceived training opportunity, and satisfaction with MOOCs. The results further show that content vividness, interactivity, and intellectual curiosity are antecedents of satisfaction with MOOCs. The present research has argued that user gratification will yield continuance with technology products. It argues that rational aspects such as career success and acquisition of tangible skills can also yield continuance with technology products and services.

Keywords: MOOC; continuance intention; course content vividness; curiosity; interactivity; career success

1. Introduction

Education has been considered a powerful weapon for societies to fight against socioeconomic backwardness. The quality provision of education to communities around the globe has also been included as one of the sustainable development goals (SDG) [1]. It is concluded that education plays a significant role in developing resilient economic development [2], the key to the development of human capital and innovativeness and economic competitiveness of a particular nation [3]. Thus, it can be argued that education is essential for countries to achieve social and economic progress [4]. However, providing education as a public good and service has been a critical problem worldwide [5]. It is a key reason that the United Nations (UN) includes education as part of SDG No. 04 [6]. The countries considered as under-developing and developing are still struggling to provide access to education facilities to their wider chunk of the population, especially in rural areas [7]. For those who have access to education, the quality of education remains a crucial problem [8].

The problem is still related to the provision and access to education in lower-income and developing countries [9]. On the other hand, middle-income and richer countries face the problem of changing the economic landscape in which digitalization, automation, and artificial intelligence will dominate [10]. There is also a developing need to change the entire education infrastructure to make it consistent with Industry 4.0 and develop skills that will be required in the workplaces of the future [11].



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Copyright: © 2023 by the authors. Licensee MDPI, Basel, Switzerland. This article is an open access article distributed under the terms and conditions of the Creative Commons Attribution (CC BY) license (https:// creativecommons.org/licenses/by/ 4.0/). Hence, all of these problems associated with educational access and provision, developing a modern and Industry 4.0-skilled workforce, as well as the resilience of the education system in the event of issues such as COVID-19 require a radical solution. Technology is positioned as a critical solution that can address vital educational problems and be a tool to achieve broader SDG goals [12]. A new term of 'education technology' (Ed-Tech) is widely studied inside and outside the academic world [13]. Ed-Tech is providing a solution to significant educational problems and opportunities. There are many ways in which Ed-Tech is being used, such as immerse learning, use of simulation, gamification, and remote learning [14]. However, the most significant application of Ed-Tech has been to bring sophistication, innovation, and value-driven experience in the delivery of education under the banner of 'massive online open course (MOOC)' [15].

The MOOC is defined as "digitized materials offered freely and openly for educators, students, and self-learners to use and reuse for teaching, learning, and research" [16]. The MOOC is considered an essential evolution of Ed-Tech, revolutionizing education provision. MOOCs play a critical role in providing access to education in various disciplines freely and openly. Previously, such easy access to education was impossible due to various social, economic, and infrastructural constraints [15]. Further, an essential role of MOOCs has also been observed in up-skilling and reskilling the workforce to fit the work setting of Industry 4.0 [17]. Lastly, as observed during the COVID-19 pandemic, MOOCs played a strategic role in covering the educational loss due to the closure of schools, colleges, and universities [18]. Given the positive impact of MOOCs on the provision and access to both the quality and quantity of education, problems persist concerning the behavior of learners [19]. MOOCs are digital-based learning methods lacking discipline and good sensory interactive experiences. Thus, MOOCs face serious course completeness issues due to a lack of discipline and interactive experience [20]. Course completeness is an indicator of learners' behavioral and cognitive engagement [21], and continuance intention toward completing MOOCs will lead to more excellent learning [22]. Understanding continuance intention is a significant research problem that scientific literature needs to address.

MOOCs are an important point of research in Ed-Tech. Most of the research in MOOCs is concentrated on developing content, platform interface, design of the course, and effective delivery [23]. All these research aspects address the course and its providers' problems. However, very little research is being undertaken on learners and their behavioral perspectives (for example, [19,24,25]. The users' behavior and continuance intention to complete the particular course in the absence of discipline and interactive experience present a significant research problem. The present research is aimed at investigating learners' continuance intention. The research theorizes that learner persistence in course continuance intention results from perceived course benefits, which may include success in both career and training in the particular subject and skills. These two benefits are consistent with problems such as access to education and upskilling in the industry 4.0 era [26]. Further, MOOCs are an open and accessible source of education offered to learners, and it dramatically helps up-skilling and reskilling in the era of industry 4.0. The literature suggests that continuance intentions depend upon satisfaction that a particular course is beneficial. The present research further theorizes that three variables: course vividness, interactivity, and curiosity, will lead to satisfaction with the course and that a particular course can lead to success in both career training in a particular subject or skills. These benefits, as theorized, will lead to the persistent continuance intention of the learner who uses MOOCs.

The current study is innovative in a variety of other respects as well. Research on continuation intention toward MOOCs has already been done by a number of researchers [27–30]. This study hypothesized—and discovered—that learner satisfaction with MOOCs and learner goals, including anticipated job success and training possibilities, would result in a learner's decision to continue taking classes. The numerous crucial elements, such as course content vividness and interaction, that the present research addressed, however, have not been covered by other researchers. The following sections will present an overview of the literature related to MOOCs, their effective role, and latent variables. The next sections describe the conceptual framework and research methodology of the study. These sections will then be continued with the results and discussion, followed by a conclusion and prospects for future work.

2. Literature Review

According to the literature, online learning improves and takes less time to digest knowledge. The potential to raise the bar of higher education is made possible by the development of new information and communication technology (ICT) teaching methods. The personification of the educational approach will actually advance thanks to the pedagogically adept use of these tools, which will also aid in reducing the cost of the mass-production teaching framework.

2.1. Course Content Vividness

For any course designer to enhance vividness, many factors should be considered. The course content vividness is conceptualized as "the degree to which a course's presentation is rich and attracts students' attention; teachers' subject knowledge is defined as the degree to which students perceive a teacher to have mastered a subject" [31]. The richness of course content and the expertise of the course instructor may convey persuasive cues to the future learner about the course, and such richness may lead to significant satisfaction. Thus, the content of the course can be an essential source of messages and advertising [32].

One of the critical aspects is the mission or purpose of the course and how it can address the specific needs of future learners in the form of new skills, new knowledge, a new career path, and quick progress in an existing career [33]. The course's mission or purpose has to highlight any specific needs of the future learner visibly. Further, consistent with the mission or purpose of the course, the designer or instructor can list a range of topics, activities, assignments, and reading materials that directly address the needs of the future learner [34]. Finally, the course instructor is also an essential part of course content vividness. The learners always associate vividness and satisfaction with instructors [35]. The instructor's expertise in the subjects will help students to satisfy their learning needs effectively. Thus, it is concluded here that the vividness of course content can determine learners' satisfaction with the course, and the first hypothesis can be formed as Hypothesis 1.

Hypothesis 1: *The course, Content Vividness, is directly and positively associated with student satisfaction with MOOCs.*

2.2. Interactivity

MOOCs' interactivity is also an essential source of learner satisfaction with the course. In the recent literature, for example, Ref. [31] have conceptualized MOOCs' interactivity into two main types: the functional view and the contingency view. The functionalist view concerns the platform's interactivity with which a course is offered. It refers to interactive functions and features offered by a particular MOOC platform and embedded into the course so that it is highly interactive [36]. These functions can include a chat room, subtitles for video lectures, creating a group of learners, interaction with moderators, and the facility to upload and download reading and non-reading materials [37].

Apart from the functionalist view, a contingency view of MOOCs course interactivity refers to the perspective of behavior, which means that the function of the course makes a learner more involved with both platform and non-platform entities such as the instructor, learners, and others [38]. Consistent with the aims and conceptualization of our study, the functionalist view of interactivity is considered an important source that determines learner satisfaction with MOOCs [39]. According to [31], functionalist interactivity is defined as:

The extent to which the MOOCs contain rich displays of interactions (i.e., a MOOC is considered to have higher levels of interactivity when the MOOC includes frequent discussions between teacher and students and relatively lower levels of interactions; namely,

the teacher of the MOOC presents most of the course content, leaving less room for interaction with students). Thus, functionalist interactivity can help determine and develop satisfaction with a MOOC [40], and the second hypothesis can be formed as Hypothesis 2.

Hypothesis 2: Interactivity has a significant and positive effect on satisfaction with a MOOC.

2.3. Curiosity

Curiosity, or intellectual curiosity, is referred to as a prerequisite for learning new and innovative things [41]. In a traditional classroom setting at universities, colleges, and schools, teachers and professors always try to create intellectual curiosity among the students [42]. It is widely said that intellectual curiosity infuses passion and energy among students to go deep into the field of interest and develop a mastery of it [43]. Intellectual curiosity can play a determining role in opting for and completing a MOOC. In the literature, intellectual curiosity is the internal learner motivation and drive to satisfy their learning needs such as skills, knowledge, promotion, etc. [44]. Intellectual curiosity is considered a learner's desire to pursue a path of newness, freshness, and uniqueness in learning new things [45] and functions as "a positive emotional, motivational system" [46]. The literature suggests that the underlying cause of intellectual curiosity within an individual can be a function of the quest for information and knowledge seeking, which helps to develop a pearl of wisdom and mastery in the behavioral expression of an individual [47]. The effect of intellectual curiosity among learners can be enhanced and motivated by participation in various activities of MOOCs, such as assignments, quizzes, and discussions, as well as thinking and rethinking various aspects of the concept under discussion [48]. Thus, such enhanced participation can lower the level of the course difficulty and help to achieve completion of the course within the stipulated time [49]. Thus, it is concluded that curiosity is essential for learners when opting for and expressing satisfaction with MOOCs. Therefore, the third hypothesis can be formed as Hypothesis 3:

Hypothesis 3: Learner's curiosity has a significant and positive effect on satisfaction with a MOOC.

2.4. Satisfication

The construct of satisfaction has begun to appear in the literature on MOOCs. The researchers investigating the phenomena of MOOCs have conceptualized satisfaction, specifically learner satisfaction, along the lines of marketing. The marketing field argues that satisfaction is necessary to continuously use particular products and services [50]. As explained by [51], consumers'—or, in our context, learners'—intention to continuously use MOOCs for training in skills, for careers success, and the acquisition of knowledge will depend upon satisfaction with MOOCs in general and towards the particular platform, instructor, and course designer [52]. Present research has theorized that learners' satisfaction with MOOC platforms and instructors can depend upon three critical factors: content vividness, interactivity, and intellectual curiosity. The theory of marketing explains that value can trigger the satisfaction of learners that a product and service offer. Value, in marketing theory, is considered to be benefits that result from a product and service feature [53]. Content and its vividness are one of the key factors and features of MOOCs as services that can help learners to perceive value in terms of career success and training in cutting-edge skills [54].

Educational services such as MOOCs are intangible, and value can be derived directly from the experiences with the services. Therefore, compelling functional interactivity with a MOOC, including its platform, can help learners to perceive better experiences with MOOCs [55]. Finally, intellectual curiosity among learners to seek out new knowledge and skills can lead to satisfaction with MOOCs as they can offer a specialized package that addresses the immediate needs of learners' skills and knowledge curiosity [56]. Thus, satisfaction is a significant consequence of content vividness, interactivity, and intellectual

curiosity, which can lead to continuously using MOOCs for career success, training, and skills [57].

2.5. Perceived Career Success

Perceived career success (career success) is also a widely researched term in the field of human resource management and organizational psychology [58]. The perceived career success is associated with various outcomes, such as motivation, innovation, and organizational commitment. Thus, human resource management literature suggests that firms are interested in building perceived career success among their employees as it will enhance the commitment and motivation of employees within the organization [59,60]. Similarly, literature on education management has also provided insight into the choice of degree in which a student intends to enroll depending upon the student's realization of success in a future career [61,62]. Thus, perceived career success can also be applied as the factor that helps students opt for, continue, and complete the MOOC. The theoretical understanding of perceived career success is wide-ranging; many researchers have defined it from various perspectives. The present research provides a theoretical understanding of perceived career success, as [63] stated. According to them, perceived career success can be defined as a positive job-related outcome in the form of behavior, attitude, and skills obtained from education and experiences over a while. The present research hypothesizes that a learner who once perceives any success related to a career in the future or right after the completion of a MOOC will continue learning via the MOOC and complete it [64].

MOOCs can develop a perception of career success within the learners through the satisfaction that content vividness, interactivity of the platform, and intellectual curiosity are essential for developing mastery and expertise in subject matters or skill sets. Therefore, perceived career success developed from satisfaction with the course content, platform interactivity, and intellectual curiosity can push the individual to continue and complete the course. Therefore, the fourth hypothesis can be formed as Hypothesis 4.

Hypothesis 4: Satisfaction has a positive and significant impact on perceived career success.

2.6. Perceived Training Opportunity

The perceived training opportunity is one of the vast research constructs in human capital development and human resource management. It can be defined as learners' perception of active participation and satisfaction in using MOOCs as training opportunities to develop new skills and knowledge [65,66]. The research has argued that perceived training opportunities could result in the behavioral manifestation of knowledge and expertise in particular skills and subject matter. Further, it is being argued and theorized here that perceived training opportunities could be developed from learners' satisfaction with learning activities enshrined in the MOOCs [67].

The perceived satisfaction for learning activities enshrined in the MOOCs can be developed using factors such as vivid MOOC content, intellectual curiosity, and interactivity of the MOOC platform. Vivid content can help students perceive that MOOCs contain all the essential aspects of skills and knowledge they want to learn [68]. Further, interactivity will engage the learner, who will develop the perception that they are involved in the training activities, resulting in mastery and expertise. Finally, curiosity about learning from MOOCs will drive active participation in activities enshrined in the course, which can also lead to satisfaction with their training in specific skills and knowledge [69]. The incompletion factors faced by most MOOCs can be solved through the development of the perception of training opportunities from MOOCs. The perception of training from MOOCs will push the learner to continue their MOOC learning activities. Thus, learners' satisfaction with the course content's vividness, interactivity, and intellectual curiosity can enhance the perceived training opportunities from MOOCs [70]. Therefore, the fifth hypothesis can be formed as Hypothesis 5.

Hypothesis 5: Satisfaction has a positive and significant impact on the perceived training opportunity.

2.7. Continuance Intention

The construct of continuance intention is well-studied, researched, and investigated in the academic field of information systems. Continuance intention has been used as a continuing behavior of using information technology products and services such as software, hardware, and many others. Continuance intentions were first thought to be incorporated under the technology acceptance model, but later, [51] distinguished continuance intention from the model. According to [51], continuance intention is defined as "an individual's intention to continue using an information system (in contrast to initial use or acceptance)". The author enshrined continuance intention in his seminal work on the expectancy confirmation model. According to [71]:

He was among the first scholars to distinguish between technology acceptance and continuance behavior, arguing that existing studies inappropriately use the same constructs/items to measure acceptance and continuance intention, as the reasons explaining technology acceptance are different from the ones explaining continuance intention.

Continuance intention in the Ed-Tech literature and, more specifically, in the MOOC literature has become a popular construct. It is positioned to solve the problem of MOOCs' incompleteness [72]. Continuance intention in the setting of MOOC is defined by [73] as "the extent to which learners were willing to continue participating in a MOOC". The wide-ranging literature on MOOCs has confirmed the role of satisfaction with MOOCs as the antecedent of continuance intention. The literature argues that satisfaction with information technology products can lead to sustained intention to use such products [27,74]. However, the present research has argued that MOOCs are not designed to satisfy some intrinsic and extrinsic needs of consumers.

Further, unlike other products, learners usually pay less for MOOCs. Thus, it might be challenging to yield continuance intention from satisfaction alone. Therefore, by looking at the nature of MOOCs as a facility that is designed as an education product, two aspects that are closely associated with education (career success and training opportunity) yielded from MOOCs satisfaction can determine the continuance intention [75,76]. Therefore, the sixth, seventh, and eighth hypothesis can be formed as Hypothesis 6, Hypothesis 7, and Hypothesis 8.

Hypothesis 6: Perceived career success has a positive and significant impact on continuance intention.

Hypothesis 7: Perceived training opportunity has a positive and significant impact on continuance intention.

Hypothesis 8: Satisfaction with MOOCs has a positive and significant impact on continuance intention.

2.8. Latent Variables

The majority of social science theories contain connections between ideas that cannot be explicitly observed. All constructions have behavioral measures, including those relating to creativity, friendliness, aggression, and other personality and affective traits. However, these observable measures are typically thought to be subpar representations of the (supposed) underlying construct. The defects are caused by measurement mistakes and the possibility that underlying constructs other than the one of primary concern have an impact on the observed behavior. Latent variable models, a type of statistical approach, have been created to offer accurate assessments of theories using unobserved variables [77].

A subclass of probabilistic graphical models (PGMs) known as latent variable models (LVMs) includes variables that are never observed in training data and are, thus, "latent". These models may capture complicated structure in data without supervision, but they also require more computational resources than fully observed models. In order to describe and investigate the links between a broader collection of observable variables, a variety of statistical techniques known as latent variable modeling are used. The many different

types of analyses that fall under this umbrella can be broadly divided into four groups: models that assume one or more latent dimensions (exploratory and confirmatory factor analysis), one or more latent categories (latent class analysis, latent profile analysis), both latent categories and dimensions (factor mixture modeling), or structural models that posit relationships between latent variables. Taxometric techniques such as cluster analyses, while not strictly latent models, also look at the issue of whether observed data can be explained by one or more categories.

3. Conceptual Framework

This research uses the quantitative knowledge by endorsing the Saudi Students' behavior towards massive open online courses. The partial least square-structural equation modeling (PLS-SEM) was used as a tool for data analysis [77]. The conceptual framework of this study is shown in Figure 1 in detail.



Figure 1. Conceptual framework.

4. Research Methodology

The goal of this study is to examine Saudi students' behavior towards massive open online courses (MOOC's), which is based upon quantitative approaches to accomplish the purpose of this study.

4.1. Research Design

The present research, which proposes to study the continuance intention of MOOCs yielded from perceived career success and perceived training opportunity, is based upon quantitative research design [78], the objective of which is to test the causal hypothesis and explain the causal effects between variables under testing [79]. The present research proposed employing a survey questionnaire as a tool for data collection and employing multivariate structural equation modeling techniques as tools for data analysis [28].

4.2. Population and Sampling

The present research studied the behavior of continuance intention of university students from Saudi Arabia who are taking MOOCs. Thus, the population frame of the present research is Saudi Arabian citizens who are currently taking or intend to take any MOOCs on a range of platforms. The students enrolled in the university are the perfect cases for studying the continuance intention towards MOOCs. The students are taking these kinds of courses to augment their learning at university and build skills that he/she thinks can help them in securing a career. The sampling technique used in the present research is two-stage purposive and convenience sampling [80,81], and only those respondents who were enrolled and taking any MOOCs on a range of platforms were requested to participate

in the data collection process. The present research completed the process of data collection from the sample within the time frame of 3.2 months, which started in September 2022 and finished at the end of November. The present research used G*power software to calculate the sample size. [82]. The sample G*power suggested that a sample of 200 would be adequate for the present study. The present research started by collecting data for the current study and finished with a sample of 376 in order to establish the generalizability of the present research, as the sample size is derived from using statistical techniques through G*Power software.

4.3. Data Collection Tools

The present research employed a survey questionnaire as a tool for data collection. It is one of the most popular tools of data collection used in quantitative and causal research design [83]. It consists of three parts: demographics, knowledge related to MOOCs, and items to measure the study's variables. It also includes a screening question that will satisfy the purposive sampling design of our study. Appendix A questionnaire section is the questions of perceived career success, continuance intention, satisfaction, content vividness, interactivity, curiosity, and perceived training opportunities.

4.4. Ethical Consideration

The present research has followed due process and protocol, ensuring that data collected from the study sample is for the purpose of research and references. The data will remain confidential and will not be shared with any third party. Further, it shall only be used for developing and contributing to academic purposes and knowledge creation.

4.5. Instrument Development

As shown in the conceptual framework in Figure 1, the instrument to measure the study's variables has been adopted from the previous literature. Table 1 shows the variable, number of items, and source from which items were developed and adopted.

S. No.	Variable	No. of Items	Sources
1.	Curiosity	5	[39]
2.	Satisfaction	4	[44,84]
3.	Perceived Training Opportunities	5	[54,85]
4.	Interactivity	4	[80]
5.	Content Vividness	4	[81 <i>,</i> 86]
6.	Continuance Intention	3	[87]
7.	Perceived Career Success	10	[88]

Table 1. Data collection instrument development.

4.6. Data Analysis Technique

The present research proposes to employ partial-least-square structural equation modeling (PLS-SEM) as a tool for data analysis. It is one of the widely used non-parametric multivariate data analysis tools, and it best matches the current study as non-probability sampling has been employed, which results in non-parametric data. Further, PLS-SEM is a multiple regression technique with higher predictive power than linear regression techniques [89]. PLS-SEM contains two types of testing: measurement and structural. The measurement model is employed to assess the validity and reliability of data and data collection instruments, explanation of variance, and model fitness [89], while the structural model is employed to test the hypothesis and assess path effects [90].

5. Results and Discussion

This section introduces the findings of the research dependent on the gathered information to investigate the study learners' lack of continuance of MOOCs at Jazan University, KSA.

5.1. Demographic Analysis

The results showed that male participants of the study were 41% and female participants 59%. The majority of ages reported in the data are between 18 to 25 years, i.e., 88.7%. Most of the sample reported their income to be 18,000 Riyal (84.8%). Lastly, the majority (93%) of the sample under the investigation was reported to have a bachelor's degree. On questions of MOOC use and preferences, 32.6% reported having used and completed MOOCs, and 33.5% reported registering for any specific course on a MOOC; 84.3% of samples opined that MOOCs are a valuable solution in education; 47% think that MOOCs complement the traditional educational system, while 42.6% are not sure of any role for MOOCs in the traditional educational system. When asked whether MOOCs are better than traditional education, 39.1% reported no, 39.6% reported not being sure, and 21.3% reported yes.

5.2. Construct Validity and Reliability

In this study, Cronbach's alpha and composite reliability were used to illustrate the internal consistency of items with construct. The literature suggests that a value of 0.70 on both Cronbach's alpha and composite reliability shows that the data collection instrument has internal items consistent with the construct [91]. The results of construct reliability, as illustrated through Cronbach's alpha and composite reliable and internally consistent. On the other hand, construct validity is the ability of items and instruments to measure the intended concept of research [92]. The construct validity in the present research is measured through the average variance extracted, and to assume that each variable has achieved construct validity, that must be at least 0.50 [91]. The results of construct validity, as illustrated through average variance extracted, are shown in Table 2, which shows that each variable has a reported value of 0.50 on average variance extracted, so construct validity is achieved.

Parameters	Cronbach's Alpha	Composite Reliability	Average Variance Extracted (AVE)
Curiosity	0.970	0.978	0.918
Continuance Intention	0.845	0.928	0.866
Course Content Vividness	0.947	0.966	0.903
Interactivity	0.886	0.946	0.898
Perceived Career Success	0.921	0.930	0.570
Perceived Training Opportunity	0.957	0.969	0.886
Satisfaction	0.926	0.948	0.819

Table 2. Construct validity and reliability.

5.3. Discriminant Validity

The present research has employed the Heterotrait-Monotrait ratio of correlations (HTMT) as a statistical test to illustrate discriminant validity results. Discriminant validity refers to the extent to which a construct is distinct from other constructs in the same research context [93]. HTMT is a commonly used method for assessing discriminant validity and is calculated as the ratio of the correlations between a construct and its measures to the correlations between the construct and measures of other constructs. The literature shows that to ensure that the construct has achieved discriminant validity, the value of HTMT must be lower than 0.89 [94,95]. The results in Table 3 show that this requirement has been achieved. It can be concluded that discriminant validity has been achieved.

	CR	CI	CV	Ι	PCS	РТО	S
Curiosity-CR							
Continuance Intention-CI	0.667						
Course Content Vividness-CV	0.502	0.582					
Interactivity-I	0.532	0.815	0.599				
Perceived Career Success-PCS	0.697	0.788	0.683	0.750			
Perceived Training Opportunity-PTO	0.499	0.405	0.460	0.447	0.765		
Satisfaction-S	0.487	0.739	0.582	0.654	0.664	0.511	

Table 3. Discriminant validit	y.
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5.4. Indicator Reliability

The indicator reliability refers to each of the items of the data collection instrument explaining an appropriate variance in the measurement of the construct. The literature shows that an item is essential and can explain an appropriate variance when it has achieved construct validity and reliability [86]. The indicator reliability in the present research is assessed through tests of outer loading [91]. The results initially showed that each variable—except perceived career success—had achieved both reliability and validity. Therefore, two items of perceived career success and one item of course content vividness were removed based on the assumption that they did not explain any variance in the constructs. The results of outer loading are shown in Figure 2.



Figure 2. Measurement model.

5.5. Explanation of Variance

The R^2 refers to a statistical test to understand the contribution of the independent variable's variance to the dependent variable's variance. The results in Table 4 and visually in Figure 2 show that course content vividness, interactivity, and curiosity combined contribute 65.2% of the variance in satisfaction. Satisfaction contributes 41.2% to the variance of perceived career success and 52.6% to the variance of perceived training opportunities. Perceived training opportunity and perceived career success combined contribute 71.2% to the variance of continuance intention. The results show that the present model has the strength required to appropriately test the hypothesis and make predictions [96,97].

	R Square	R Square Adjusted
Continuance Intention	0.705	0.702
Perceived Career Success	0.430	0.429
Perceived Training Opportunity	0.233	0.231
Satisfaction	0.438	0.433

Table 4. Explanation of variance.

5.6. Model Fitness

The present research employed SmartPLS 3.40, which helped us to assess the goodness of fit through the widely followed statistical index of square root mean residual (SRMR). The literature on SmartPLS suggests that an SRMR value between 0.08 and 0.10 would be considered an appropriate goodness of fit [94]. The results in Table 5 show that the SRMR value for the current research is 0.089. The present research has achieved goodness of fit.

Table 5. Model fitness.

	Saturated Model	Estimated Model	
Continuance Intention (CI)	0.09	0.115	

5.7. Measurement Model

Results of Figure 2 illustrate the measurement model of Saudi student behavior while using the MOOCs.

5.8. Assessment of Structural Model

The present research assessed the structural model to test the hypothesis and calculate the path coefficient. The bootstrapping procedure was applied based on 5000 iterations of sub-samples. The results in Table 6 show that all hypotheses of the present research are statistically significant based upon a p value of less than 0.05. A detailed analysis of the results is presented in the discussion sections.

Table (6.	Structural	model.
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S. No.	Hypothesis	Path Co-Efficient	T Statistics	p Values	Decision
H1	$\text{CV} \rightarrow \text{S}$	0.269	4.992	0.000	Accepted
H2	$\mathrm{I} \to \mathrm{S}$	0.375	6.021	0.000	Accepted
H3	$C \rightarrow S$	0.147	3.214	0.001	Accepted
H4	$S \to PCS$	0.656	25.393	0.000	Accepted
H5	$S \to PTO$	0.483	10.685	0.000	Accepted
H6	$\text{PCS} \to \text{CI}$	0.815	15.052	0.000	Accepted
H7	$\text{PTO} \rightarrow \text{CI}$	0.307	6.468	0.000	Accepted
H8	$S \to \text{PTO}$	0.483	10.685	0.000	Accepted

The present research attempted to address a research problem in the literature on MOOCs that calls for understanding the behavior of continuance intention. With the revolution of MOOCs as Ed-Tech, people have flocked to register for and take MOOCs on various platforms. However, continuing their intention to complete the course and registering for another course needs improvement. The present research filled this gap by theorizing that learner continuance intention depends upon two essential learning goals: success in the career and training in new skills and knowledge. The research further theorized that their satisfaction with MOOCs would determine learners' perceived career success and training. The results of the data analysis are discussed below.

The present research theorized that satisfaction refers to the perception of learners that MOOCs will satisfy their career success, new skills training, and knowledge needs [45]. The theory continues: learners' expression that MOOCs will satisfy career and training needs depends on three significant factors: the vividness of course content, interactivity in the MOOCs, and the intellectual curiosity of learners. The result of the structural equation modeling confirmed that all three factors have a significant impact.

The research also theorized that course content vividness which is "the degree to which a course's presentation is rich and attracts students' attention" [31], generates significant satisfaction with MOOCs and has been accepted based upon p = 0.000. Thus, it is concluded that the rich content of the course, which includes a diverse range of material from audio and videos to written material, will help learners to develop satisfaction (by $\beta = 0.269$). They will perceive that course content will help them achieve success in their career or training in new skills [40]. Similarly, it was hypothesized that interactivity with MOOCs and their platforms would also result in satisfaction because the interactivity would help learners effectively satisfy their learning needs. The results of data analysis show that interactivity has a significant impact on satisfaction based upon p = 0.000. The results also showed that interactivity would result in a 37.5% ($\beta = 0.375$) increase in learners' satisfaction [40]. The last factor that impacts learners' satisfaction with MOOCs is intellectual curiosity. It was argued that intellectual curiosity would positively impact the satisfaction of MOOCs as they offer a wide range of courses and materials. The hypothesis has been found to be significant (p = 0.001), and it has been found that people with greater intellectual curiosity will express a higher level of satisfaction with their MOOC ($\beta = 0.147$) [49].

The present research further theorized that satisfaction with MOOCs derived from the course content vividness, interactivity, and intellectual curiosity would result in learners' perceived goal achievement, categorized into career success and training in new skills and knowledge. The research tested the hypothesis of the causal impact of satisfaction with MOOCs on both perceived career success and perceived training opportunity, and the results show a significant impact of satisfaction on both factors. The research concluded that satisfaction with MOOCs would be a pre-determinant of perceived success in a career after completion of the course. The results of the data analysis suggested that satisfaction derived from its antecedents is a significant determinant of perceived career success (p = 0.00 and $\beta = 0.656$) [61]. Similarly, present research from the literature also conceived that satisfaction with MOOCs would be a fundamental cause of perceived training opportunities. The results of the data analysis show that satisfaction is also a significant predictor of the perceived training opportunities. The results of the data analysis show that satisfaction is also a significant predictor of the perceived training opportunity offered by MOOCs (p = 0.00 and $\beta = 0.483$) [68].

Lastly, the present research theorized that the continuance intention of MOOCs learners would result from satisfaction and two of each learner's goals: perceived career success and perceived training opportunity. The results have found that satisfaction (p = 0.000, $\beta = 0.269$), perceived career success (p = 0.000, $\beta = 0.815$), and perceived training opportunity (p = 0.002, $\beta = 0.301$) have a positive and significant impact on continuance intention. The results found that satisfaction with MOOC courses as the product of its antecedents will result in continuance intention since satisfaction is an expression of a learner's contentment with their MOOC as a source of essential goals such as career success and training opportunities. Satisfaction also expresses a learner's gratification with MOOCs offerings regarding content, interactivity, and curiosity [27,74]. The results also show that learners' perceived satisfaction with goals in taking MOOCs, categorized as career success and training opportunities, can also significantly impact continuance intention [75,76].

6. Conclusions

Education technology, Ed-Tech, is positively impacting the provision of accessible and quality education all around the globe through MOOCs. They were first introduced in 2011 and had been making a new wave through the entire Ed-Tech industry. Today, many universities have developed platforms on which quality education is provided to the general public free of charge. New platforms of MOOCs, such as globally recognized Edx, Coursera, Udemy, and Khan Academy, as well as regional and local platforms, such as Rawaq and Maarefh in the Middle East and Saudi Arabia, have also emerged. These platforms are becoming even more popular; more and more people are choosing MOOCs and platforms for their learning goals. However, there is a need for research concerning the continuance of MOOCs after registration, completing them successfully, and registering with another course. It is stated that most learners still need to complete the course, which compromises the ability of MOOCs platforms and instructors to complete learning goals. The present research attempted to address this research problem by empirically developing and testing a conceptual model with the help of structural equation modeling.

The present research theorized—and found—that a learner's continuance intention would be the product of satisfaction with MOOCs and learner goals such as perceived career success and perceived training opportunities. Course content vividness, interactivity, and intellectual curiosity drive satisfaction, affecting both continuance intention and learner goals. The results of the present study confirm that continuity with MOOCs depends upon a learner's perception of his/her career and any tangible skills obtained from them. Therefore, MOOC designers need to understand the importance of career progression and skills and knowledge training within each MOOC. On the other hand, the present research has also confirmed the critical role of satisfaction with MOOCs, providers, and platforms. Satisfaction was initially conceived along the lines of marketing, which argues that satisfaction is a feeling of gratification with a product and service, and the learner, once satisfied, will continue using the product and services. The results also suggested that learners' satisfaction will lead to a continuance intention. The present research found that course content vividness, interactivity with MOOCs and platforms, and intellectual curiosity lead to satisfaction with MOOCs. The result suggested an indirect effect of content vividness, interactivity with MOOCs and platforms, and intellectual curiosity on continuance intention, perceived career success, and perceived training opportunity.

To develop a continuance intention to solve the problem faced by MOOC-based Ed-Tech industries, the course designer must incorporate vividness in content, interactivity, and intellectual curiosity. These three elements drive satisfactions which, in turn, develops the perceived career success and perceived training opportunity. Finally, perceived career success and perceived training opportunities, along with satisfaction, lead to solid continuance intention of learners.

The present research is also novel in many different ways. Various previous researchers have conducted research on continuance intention toward MOOCs [27–30]. However, previous researchers have not addressed the many essential aspects that the preset research addressed. First, previous research determined or yielded satisfaction with MOOCs technology by studying and investigating key essential features such as course content vividness on the platform and interactivity with it. On the other hand, previous researchers have only examined the personal, social, and environmental factors with MOOCs. However, it should be noted that satisfaction with MOOCs platforms must be the result of essential features related to the platform itself, such as course content vividness and interactivity.

This research has tested two crucial factors of perceived career success and perceived training opportunity as consequences of satisfaction with MOOCs. Moreover, consistent with the previous research, the present study has also determined satisfaction using the motivational factor of curiosity. Secondly, the current study has also focused on the instant needs of learning needs associated with MOOCs. The current study also theorized that perceived career success and training opportunities could finally yield continuance intentions towards MOOCs. Marketing theory clearly explains and makes a novel contribution that continuing usage by the consumer depends upon the value that a product or service provides to the consumers. Consistent with the marketing theory, the present research has examined and successfully yielded perceived career success and training opportunities as a consequence of satisfaction with the MOOCs platform and its continuous usage. However, the previous researchers have yet to focus on the benefits or the value, such as perceived career success and perceived training opportunity that MOOCs provide to learners.

6.1. Managerial and Policy Implications

The present research offers some tangible implications for policymakers and managers involved in the marketing and designing of MOOCs. First, every course needs to incorporate either career success or training into cutting-edge skills and knowledge as a result of the course completion. Each learner's motivation to continue using the course will depend upon what the course offers regarding career progression and training in new skills such as artificial intelligence and digital marketing. Second, along with future career success and skills, satisfaction with the course is also a core determinant of continuing to use MOOCs. Finally, the present research offers some tangible guidelines that need to be incorporated into MOOCs to develop satisfaction and continuance intention. These guidelines are the enhanced focus on developing vivid course content; the MOOCs and platforms need to be interactive; and finally, the course must address the intellectual curiosity of the learner.

6.2. Theoreticial Implications

For general education theory, the present research offers some tangible implications for the theoretical model of information systems continuance developed. First, the present research confirms the application based on empirical evidence. Secondly, the present research operationalized the construct of satisfaction as defined in the marketing and found that the marketing concept of satisfaction can be an essential predictor of continuance intention. Third, the present research offers some of the tangible implications model, which states that, apart from gratification, which is well observed in information system products such as games, social media, and others, continuance usage may also depend upon rational aspects such as success in a learner's career and training in new skills. A product such as a MOOC may not generate gratification, so continuance usage in MOOCs may be a problem, but such a problem can be addressed through rational values such as career success and training in new skills. As career and skills training has been operationalized here, other constructs of a rational nature can be employed to test behavior continuance intention in future research.

6.3. Limitations and Future Research Recommendations

The present research has various limitations, which can be addressed in future studies. First, the current research's scope is limited to students studying at Jazan University. However, to establish a more comprehensive empirical validation of the conceptual model, researchers must replicate the model in various other cultural contexts. Secondly, present researchers have employed the theoretical model of continuance intention by [51]. This theoretical model is widely used in understanding the adoption of varying natures of information systems such as MOOCs. However, other theories, such as the uses and gratification theory and the innovation diffusion model, can also be employed to understand MOOCs' adaptability, satisfaction, and usage. Thus, future researchers can explore the role of other theoretical models in understanding the phenomena of MOOCs from the learner's perspective. Finally, the present research has employed the survey questionnaire and PLS-SEM as data analytical tools. However, a novel insight can also be developed using other quantitative design methods of data collection and analysis. Thus, future researchers can use the experimental method to understand the role of MOOCs in enhancing learners' skills and learning experiences, such as students and professionals.

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participants were required to show consent by clicking "I agree" before proceeding to the survey. Furthermore, the participants were aware that the results of this research study would be published in the journal.

Data Availability Statement: The data are available from the corresponding author on reasonable request.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A. Questionnaires

Perceived Career Success

- 1. I shall receive fair rewards compared to the other people I know (not just in my field).
- 2. The remuneration I shall receive for my professional activities will be fair as I have already invested in my career.
- 3. I am calm about my future regarding my financial and material needs.
- 4. My income will meet my needs and those of my dependents.
- 5. The professional prestige (or status) of my hierarchical position is in line with my interests.
- 6. I am proud of what I shall do professionally.
- 7. The works I shall be doing in my career comprise a wide variety of tasks.
- 8. I have created important innovations during my professional career.
- 9. I am constantly learning and developing for a good career in the future.
- 10. The work I shall carry out in my career will require a high level of competence.

Continuance Intention

- 1. I intend to use Specific-MOOC in the future continuously.
- I intend to utilize Specific-MOOCs for various purposes, such as self-development as well as earning credit hours.
- 3. If Specific-MOOCs become diverse in the future, I intend to use it frequently, even after graduation.

Satisfaction

- 1. I am satisfied with learning in Specific-MOOCs.
- 2. I am pleased to earn my credit in Specific-MOOCs.
- 3. I am contended with the way to earn credits in Specific-MOOCs.
- 4. Learning in Specific-MOOCs is a very delightful experience.

Content Vividness

- 1. Procedure instructional content on MOOCs is animated.
- 2. Procedure instructional content on MOOCs is lively.
- 3. MOOCs contain procedure instructional content that is exciting to the senses.
- 4. I can acquire procedure instructional content on MOOCs from different sensory channels.

Interactivity

- 1. MOOC Platform Enables me to understand the content better.
- 2. MOOC Platform Enables me to learn more from the course.
- 3. MOOC Platform Enables me to use summaries and compare them with others.
- 4. MOOC Platform Enables me to address my concerns.

Curiosity

- 1. I am interested in discovering how things work.
- 2. When I am given a new kind of arithmetic problem, I enjoy imagining solutions.
- 3. When I see a complicated piece of machinery, I like to ask someone how it works.
- 4. When I am given an incomplete puzzle, I try and imagine the final solution.
- 5. When I am given a riddle, I am interested in trying to solve it.

Perceived training opportunities

- 1. MOOC can be used as cross-training for multiple jobs/multi-skilling practiced in your organization.
- 2. MOOC can be used as formal workplace-based training (uncertified).
- 3. MOOC can be used as informal workplace-based training available to you.
- 4. MOOC can be used as systematic training available to you.
- 5. MOOC can be used as sponsored courses available to you by your University.

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