



RELATIONSHIP OF PERCEIVED USEFULNESS, PERCEIVED EASE OF USE, AND INTEGRATING PERSONAL INNOVATIVENESS IN INFORMATION TECHNOLOGY (PIIT) WITH THE INTENTION TO USE MOOCS CONTINUOUSLY USING THE TECHNOLOGY ACCEPTANCE MODEL

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ABSTRACT

This study assesses the adoption of Massive Open Online Courses (MOOCs) by Saudi students in Australian universities, exploring its potential impact on achieving Saudi Vision 2030 goals. Utilizing the Technology Acceptance Model, integrated with Personal Innovativeness in Information Technology (PIIT), the study examines the intention to continuously use MOOCs through Perceived Usefulness (PU), Perceived Ease of Use (PEOU), and PIIT. Four hypotheses were validated with survey responses from 141 Saudi students, revealing correlations between demographic factors, learning benefits, and technology adoption. Male students aged 25 to 44, pursuing diverse courses, exhibited a higher likelihood of continuous MOOC adoption. The majority (65-75%) found MOOCs instrumental in various learning tasks, emphasizing ease of use and control. These capabilities fostered a willingness to explore new technologies promptly. Despite hesitations among some students, a significant majority expressed a readiness to predict, plan, and intend to use MOOCs continuously.

The study recommends strategies to enhance MOOC adoption in Saudi Arabia, targeting students, faculty, university management, the Ministry of Education, and the government, aligning with Vision 2030 objectives. Acknowledging study limitations, these findings provide valuable insights for future research and initiatives in the evolving landscape of online education.



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1. INTRODUCTION

Online education has grown rapidly. It was especially useful during the recent period due to the implementation of masking and social distancing to prevent its spread in many countries. The condition in Saudi Arabia was not different. Online learning increased accessibility to education for all (Lee, 2017). In Saudi Arabia, this is particularly advantageous to women, who are unable to access vast opportunities for university education due to gender segregation.

One of the ways in which online education is offered is through Massive Open Online Courses (MOOCs). As the name indicates, MOOCs enable the education of millions of learners, without any restrictions (Open) and they are necessarily offered in online modes. MOOCs can be accessed by anyone, anytime and from anywhere (Alario-Hoyos et al., 2017). Many reputed universities offer MOOCs for various subjects. However, most MOOCs are not equivalent to regular university education and therefore may not help in getting jobs. Some MOOCs require payment of certain fees, while others may be free. There are credit-eligible and non-eligible courses. Credit-eligible courses facilitate entry into university education. MOOCs are facilitated by technologies. There are facilities for students to interact among themselves and with teachers.

Most research on MOOCs is focused on an overview, a description, an explanation of concepts, technical aspects, awareness, and identification of challenges (Scanlon et al., 2015; Deng et al., 2019; Haumin & Madhusudhan, 2019). There are few learner-centred studies. The continuous adoption of the new product is an important issue for researchers and practitioners, as was pointed out by Chen et al. (2018) and Joo et al. (2018).

2.1 Problem statement

The importance of studying the learner's continuous adoption intentions cannot be overemphasized. This paper addresses this gap.

Globally, the size of the MOOC market size was 3.9 million USD in 2018 and is projected to reach 20.8 billion USD by 2023 (Global Info Research, 2019), and could exceed USD 60 billion by the end of 2029. The estimated compound annual growth rate is 40.1% (Business wire, 2019). In the Saudi Vision 2030, education has a critical importance, as it is valued at 2.4 billion USD.

Very little research has been done on the factors affecting the adoption or continued use of MOOCs in the Arab world (Khan et al 2018). A low rate of adoption may lead to a low rate of continuous use. If Saudi students in Western universities get a chance to use MOOCs, they can implement it in Saudi Arabia with the support of the Saudi government. To do this, information on the students' perceptions of its usefulness and their intentions to use MOOCs in future is required. This paper examines this issue in detail as per the aim defined below.

2.2 The aim

To investigate the factors for the continuance intention to use MOOCs by Saudi students in Australia by integrating the Personal Innovativeness in Information Technology (PIIT) Theory as a moderator and Technology Acceptance Model (TAM).

The scope of this research was restricted to Saudi students in Australia, MOOC users, and only PIIT theory and TAM as the theoretical basis.

All these are new knowledge with respect to Saudi Arabia. PIIT variable was added to the TAM from the literature (but not in relation to MOOCs). The findings could help to implement MOOCs on a large scale in Saudi Arabia to achieve Vision2030's (Saudi Arabia, 2016) educational goals.

2. METHODOLOGY

A quantitative research design consisting of a questionnaire survey was used in this research. The theoretical framework used for this study is given in Figure 1.

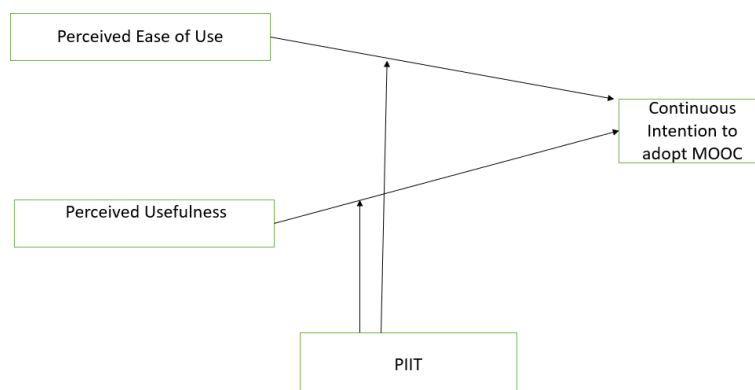


Figure 1. The research framework.

The framework in Fig1 has the following variables:

- 1) Perceived use and perceived ease of use (PU, PEOU)- independent variables.
- 2) The continuous intention to use MOOCs- dependent variable.
- 3) Personal innovativeness in information technology (PIIT) moderator variable.

Based on the evidence in the literature, the following hypotheses were formed in line with the aim of this research:

- H1: Perceived usefulness will have a positive impact on the user’s continuous intention to use MOOCs.
- H2: Perceived ease of use will have a positive impact on the user’s continuous intention to adopt MOOCs.
- H3. There is a positive relationship between perceived usefulness and continuous intention to adopt MOOCs.
- H4: There is a positive relationship between perceived ease of use and continuous intention to adopt MOOCs.

2.3 The survey instruments

The items of perceived usefulness (PU) and Perceived Ease of Use (PEU) were adapted from Davis et al (1989). A 5-point scale was used where 1 indicated “strongly disagree” and indicated “strongly agree”.

Perceived usefulness

PU1 to PU6 adapted from Davis et al (1989) are described in table 1:

Table 1. Items of Perceived Usefulness adapted from Davis et al (1989)

Code	Items	Source
PU1	MOOCs could enable me to accomplish tasks more quickly	Davis et al., (1989)
PU2	MOOCs could improve my task performance	
PU3	MOOCs could increase my task productivity	
PU4	MOOCs could enhance the effectiveness of my task	
PU5	MOOCs could make it easier to do my task	
PU6	I think I could find MOOCs usefull in my task	

Perceived Ease of Use (PEOU)

The items of PEOU adapted from Davis et al (1989) are listed in table 2.

Table 2. Items of Perceived Ease of Use adapted from Davis et al (1989)

Code	Items	Source
PEOU1	I think that learning to operate MOOCs have been easy for me.	Davis et al., (1989)
PEOU2	I have found it easy to get MOOCs to do what I want it to do.	
PEOU3	My interactions with MOOCs is clear and understandable	
PEOU4	I had found MOOCs to be flexible to interact whit	
PEOU5	I think it would be easy for me to become skilful at using MOOCs	
PEOU6	I think I had found MOOCs easy to use.	

Personal Innovativeness in Information Technology

For measuring personal innovativeness in information technology or PIIT, the items of PIIT 1 to 4 of the constructs of Agarwal and Prasad (1998) were adopted in the study. A 5-point scale was used where 1 indicated "strongly disagree" and 5 indicated “strongly agree”. The list of items in this scale is presented in table 3.

Table 3. Items of PIIT adapted from Agarwal and Prasad (1998).

Code	Items	Source
PIIT1	If I heard about a new information technology, I would look for ways to experience whit it.	Agarwal and Prasad (1998)
PIIT2	Among my peers, I am usually the first to try out new information technologies	
PIIT3	In general, I am hesitant to try out new information technologies.	
PIIT4	I like to experiment with new information technologies.	

Intention to use

For measuring continuous intention to use (CITU), the items from the behavioural intention construct of Dennis et al. (2003), as presented in table 4. A 5-point scale was used where 1 indicated “strongly disagree” and 5 indicated “strongly agree”.

Table 4. Items of measuring continuous intention to use

Code	Items	Source
CITU1	Given the chance, I intended to continue using MOOCs	Denis et al., (2003)
CITU2	Given the chance I predict that I should continue using MOOCs	
CITU3	Given the chance I plan to continue using MOOCs	

Other variables

Demographic variables like gender, age, course of study and experience with MOOCs were collected in addition to the above variables.

2.4 Sampling method

Purposive sampling was adopted for the selection of survey participants. This is because only Australian students studying in Australia were to be selected and they need to be adequately experienced in using MOOCs. Random sampling would have resulted in the selection of some Australian students. Purposive sampling avoids such an eventuality.

Sample size

Over 10000 Saudi students were studying in Australia at the time of this study. The minimum sample size required for a population of 10000 at a 5% error margin and 95% confidence is 370 (Calculator.Net, 2023). However, sometimes, a sample size of 200 is sufficient for valid statistical analysis (Hoe, 2008). In this study, 500 students were selected to meet the minimum size criteria. These 500 students were required to give informed consent. They were provided with a brief description of the project for this purpose.

To select the appropriate student participants, the students were approached through the Saudi Arabian Cultural Mission (SACM) in Canberra. Most Saudi students in Australia are managed by SACM. Emails were sent to the students identified by SACM were sent emails for the first contact. The criteria for the inclusion of students in the survey were: only full-time university students who had experience in using MOOCs for at least three months were included in this study. This was the preliminary stage of identification and sampling of the survey participants.

A draft survey instrument was developed using the frameworks reported in the literature. This was verified using experts' opinions. The questionnaire was piloted on 10 participants similar to those of the actual survey. Their feedback on filling time, clarity of questions, presence of inappropriate language, and the need to add or delete any item was used to prepare the final version of the questionnaire. This final questionnaire was administered to students via their teachers using extra time and the filled-up questionnaires were collected by the teachers and handed over to the researcher. An Arabic version of the questionnaire was supplied to those who preferred it.

Collection of the filled-up questionnaire for analysis

The survey responses which were defective, partly filled up, or having any other problems were discarded and only those devoid of these problems were included in the analysis. After all the exclusions, a total of 141 responses were available for the analysis. This gives a response rate of about 28%.

2.5 Data analysis

The 141 survey responses were analysed statistically. The procedure consisted of descriptive statistics consisting of mean, maximum and minimum and standard deviation, estimation of frequencies of item responses and correlations to test the four hypotheses of this study. The latest version of SPSS was used for these analyses.

3. RESULTS

To re-iterate, the aims of this data analysis were:

- 1) To provide a profile of the survey participants.
- 2) To verify the following hypotheses of this research:
 - a. H1- Perceived usefulness will have a positive impact on the user's continuous intention to use MOOCs.
 - b. H2- Perceived ease of use will have a positive impact on the user's continuous intention to adopt MOOCs.
 - c. H3- There is a positive relationship between perceived usefulness and personal innovativeness in information technology.
 - d. H4- There is a positive relationship between perceived ease of use and personal innovativeness in information technology.

3.1 Analytical methods

The frequency counts were estimated for all items of categorical responses and mean, and standard deviations were estimated for all items of continuous responses. Variable scores were created from the four scales of the survey as the average of the individual items. The conceptual operational definitions of the scores are provided in the statistical analysis results below.

Spearman's correlation analysis was used to verify the four hypotheses. Spearman's correlation analysis is a method, which can be used for testing the association between a pair of variables when some variables might be ordinal. A 0.05 level of significance was used as the criterion for statistical significance. The results obtained from using these methods for the analyses of data are described in the sections below.

The profile of the survey participants

Most of the survey (table 5) participants were male (82.3%), in the age range of 25 to 44 years (88.6%) and had experience of 3 months to one year (74.5%) in using MOOCs. They were using MOOCs for several courses offered by Australian universities.

Table 5. Profile of survey participants

Item	Description	Frequency (No)	Frequency (%)
Gender	Male	116	82.3
	Female	25	17.7
Age	18-24	14	9.9
	25-34	81	57.4
	35-44	44	31.2
	45-54	2	1.4
Experience in using MOOCs	3-6 months	64	45.4
	1 year	41	29.1
	3 years	18	12.8
	5 years	9	6.4
	6 years or more	9	6.4
Courses studied using MOOCs	Several courses		

3.2 Scales related to the use of MOOCs

Perceived use (PU)

1) **MOOCs could enable me to accomplish tasks quickly:** Figure 2 shows the frequency percentages for the statement: MOOCs could enable me to accomplish tasks quickly. Most participants (70.2%) claimed that MOOCs enabled them to quickly accomplish the learning tasks. About 21% of them could not decide on this issue. About 9% did not feel that MOOCs enabled them to accomplish learning tasks quickly.

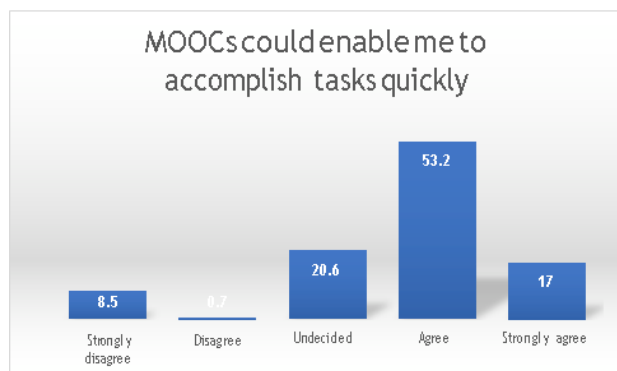


Figure 2. Response frequencies (%) of survey participants to the statement: MOOCs could enable me to accomplish my tasks quickly

2) **MOOCs could improve my task performance:** The frequency percentages of responses for this item are presented in Figure 3.

For about 80% of respondents, MOOCs improved their task performance. About 12% could not decide whether MOOCs improved their task performance. For the remaining 8% of the participants, MOOCs did not improve their task performance.

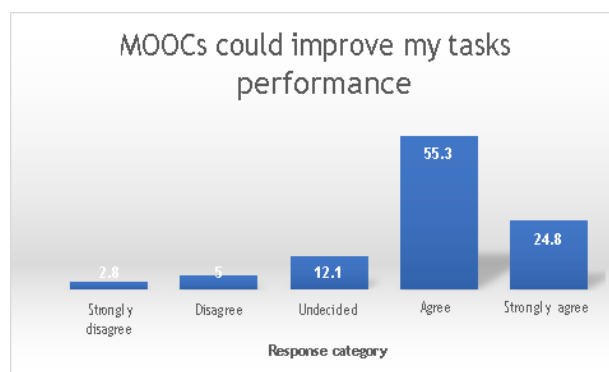


Figure 3. Frequency percentages of survey responses to the statement: MOOCs could improve my task performance

3) **MOOCs could increase my task productivity:** Figure 4 provides the data on the percentage frequencies of responses to this item by the survey participants.

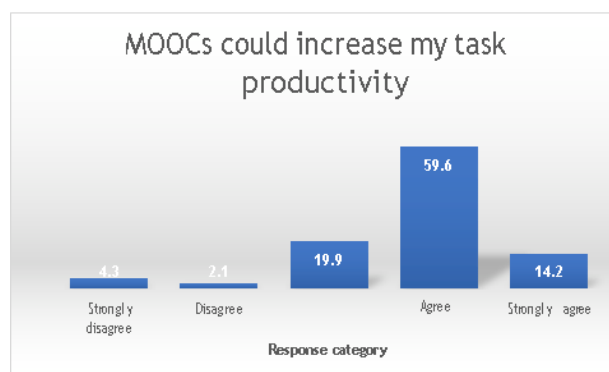


Figure 4. Response frequencies (%) of the survey participants to the item: MOOCs could increase my task productivity

About 74% of respondents agreed or strongly agreed that MOOCs could increase their task productivity. About 20% of them could not decide on this matter. The remaining 6% did not find MOOCs useful to increase their task productivity.

4) **MOOCs could enhance the effectiveness of my task:** Figure 5 provides the data on the frequency of responses by the survey participants to this item.

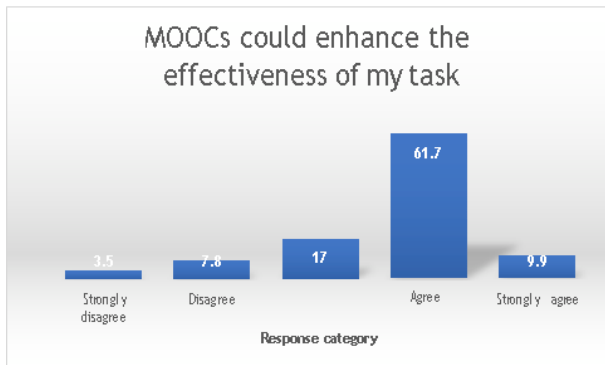


Figure 5. Percentage response of survey participants to the item: MOOCs could enhance the effectiveness of my task.

About 72% of respondents found MOOCs to enhance the effectiveness of their tasks. For 17% of respondents, no decision could be made. For the remaining 11% of respondents, MOOCs did not increase the effectiveness of their tasks.

5) **MOOCs could make it easier to do my task:** The frequency percentages of responses by participants have been presented in Figure 6.

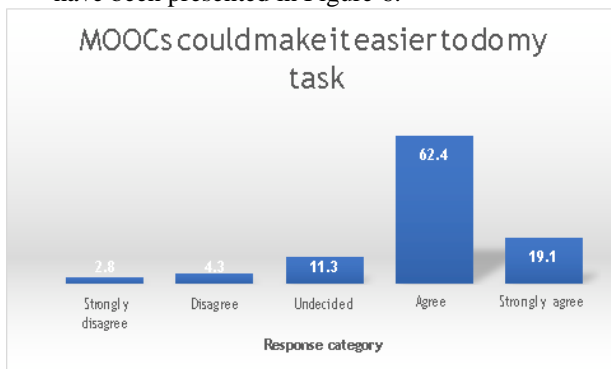


Figure 6. Frequency percentages of responses of survey participants to the item: MOOCs could make it easier to do my tasks.

About 82% of respondents reported that MOOCs could make it easier to do their tasks. About 11% of them could not decide whether MOOCs could help them in this way. The rest of them disagreed with the claim.

6) **I think I could find MOOCs useful in my task:** Response frequency percentages of the survey participants to the item: I think I could find MOOCs useful in my task, are presented in Figure 7.

For about 75% of respondents, MOOCs were useful in their tasks. About 15% of them could not decide whether MOOCs were useful in their tasks. For 10% of the participants, MOOCs were not useful in their tasks.

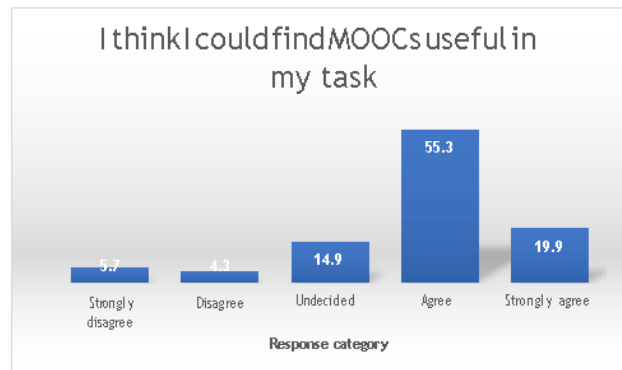


Figure 7. Response frequencies of survey participants to the item: I think I could find MOOCs useful in my task

Perceived ease of use (PEOU)

The frequency responses for items under this scale are described below.

1) **I think, learning to operate MOOCs have been easier for me:** The percentage frequency responses by survey participants to the item: I think, learning to operate MOOCs have been easier for me, are presented in Figure 7.

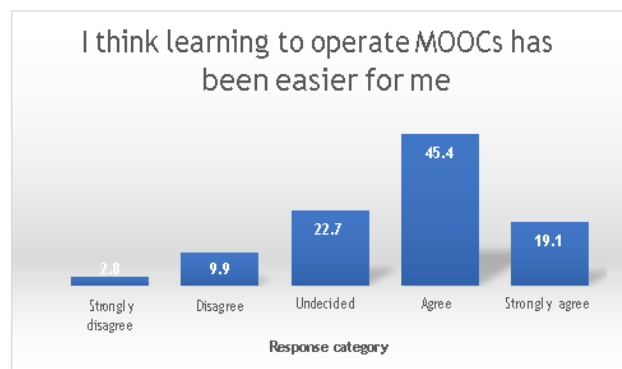


Figure 8. Percentage responses of the survey participants to the item: I think learning to operate MOOCs has been easier for me

According to the data in figure 8, 65% of the survey respondents found learning to operate MOOCs was easier. About 23% of the survey respondents could not decide whether learning to operate MOOCs was easier or not. The remaining 12% of them did not find learning to operate MOOCs easier.

2) **I have found it easy to get MOOCs to do what I wanted it to do:** The percentage frequencies of survey responses are provided in figure 9. About 75% of the survey respondents could easily get MOOCs to do what they wanted it to do. About 17% could not decide whether this is possible. The remaining 8% did not find it easy to get MOOCs to do what they wanted it to do.

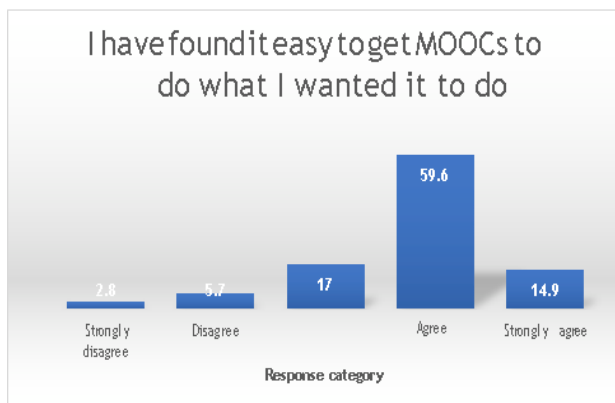


Figure 9. Percentage frequencies of responses to the item: I have found it easy to get MOOCs to do what I wanted it to do.

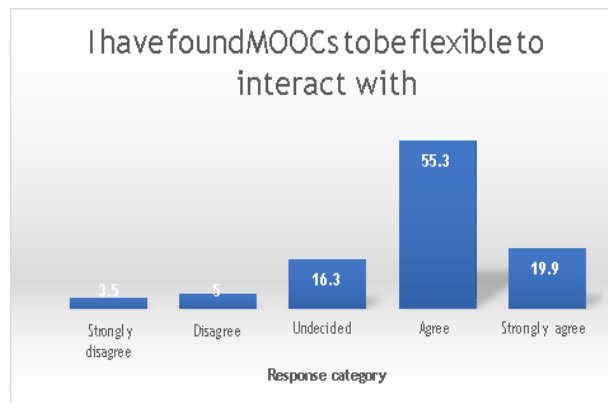


Figure 11. Frequency percentages of the responses of the survey participants to the item: I have found MOOCs to be flexible to interact with.

3) **My interaction with MOOCs is clear and understandable:** The percentage frequency of responses by survey participants to the item: My interaction with MOOCs is clear and understandable, is given in figure 10.

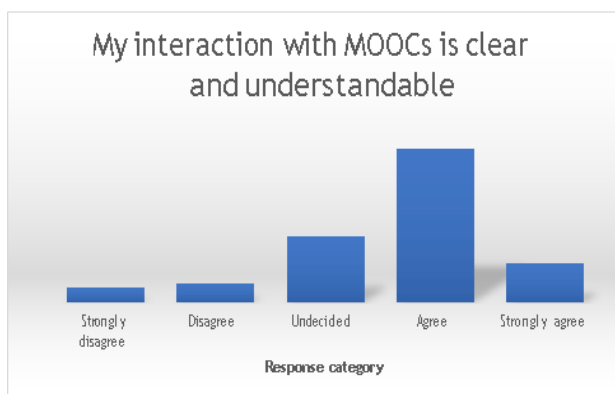


Figure 10. Percentage frequency of responses by the survey participants to the item: My interaction with MOOCs is clear and understandable.

For about 66% of the respondents, interactions with MOOCs were clear and understandable. About 23% of them were undecided on this issue. The remaining 11% of them did not find their interactions with MOOCs clear and understandable.

4) **I have found MOOCs to be flexible to interact with:** The percentage frequencies of the responses of the survey participants to the item: I have found MOOCs to be flexible to interact with, has been presented in figure 11.

About 75% of the respondents agreed or strongly agreed that they found MOOCs flexible to interact with. About 16% were not sure of it. The remaining 9% of them thought MOOCs to be inflexible for interactions.

5) **I think it will be easy for me to become skillful at using MOOCs:** The frequency of percentages of the survey responses to the item: I think it will be easy for me to become skillful in using MOOCs, are presented in figure 12.

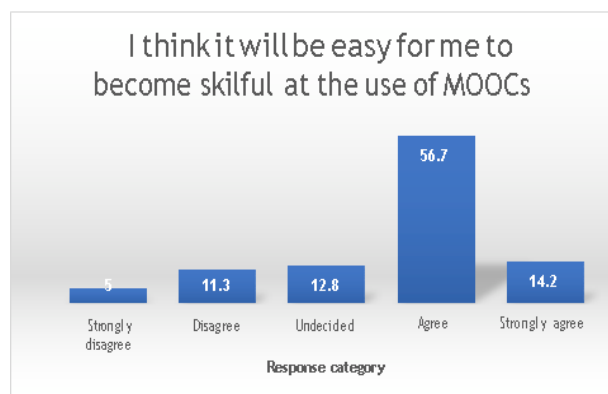


Figure 12. Frequency of responses of the survey participants to the item: I think it will be easy for me to become skilful in using MOOCs

About 71% of the participants thought it to be easy for them to become skilful in using MOOCs. About 12% of them were undecided about it. The remaining 17% did not agree with the statement.

6) **I think I had found MOOCs easy to use:** The percentage responses of the survey respondents to the item: I think I had found MOOCs easy to use, have been displayed in figure 13.

About 69% of the respondents had found MOOCs easy to use. About 21% of them were not sure of this. For the remaining 10% of the survey participants, MOOCs were difficult to use.

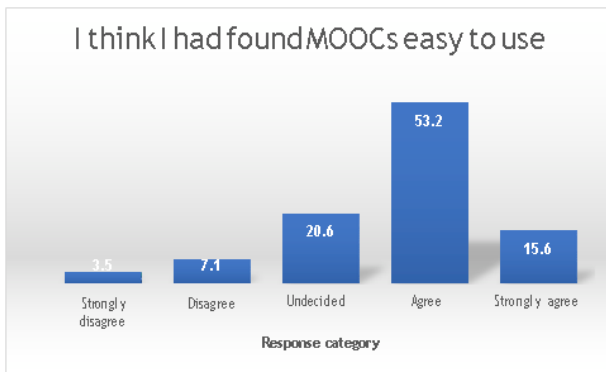


Figure 1. Response frequencies (%) of the survey participants to the item: I think I had found MOOCs easy to use

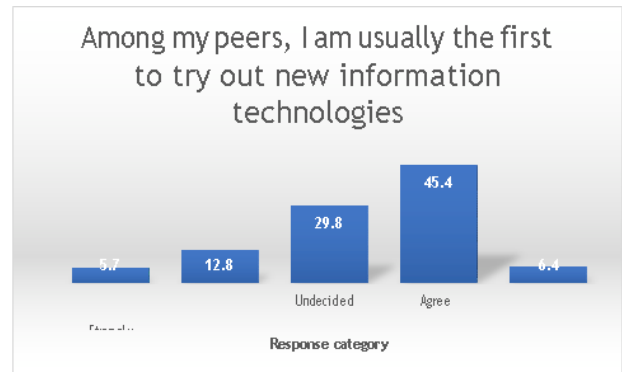


Figure 15. Percentage responses to the item: Among my peers, I am usually the first one to try out new information technology

Personal innovativeness in information technology (PIIT)

The frequencies of responses obtained for the items under the PIIT scale are described below:

- 1) If I heard about a new information technology, I would look for ways to experience:** The percentage frequency of responses to this item is presented in Figure 18. About 74% of the respondents would look for experiencing any new information technology they came across. About 16% of respondents were undecided about whether they would like to experience any new information technology. The rest of the 10% of participants did not want to experience any new information technology they came across.

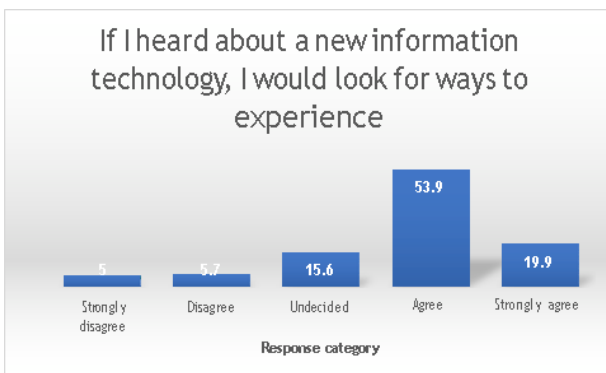


Figure 2. Percentage responses to the item: If I heard about a new information technology, I would look for ways to experience

- 2) Among my peers, I am usually the first to try out new information technologies:** The percentage responses obtained for this item are presented in figure 15.

About 52% of the survey respondents agreed or strongly agreed with the item statement. About 30% were undecided about it. The remaining 18% were not the first among their peers to try out new information technology.

- 3) In general, I am hesitant to try out new information technologies:** The survey responses to this item have been presented in figure 16.

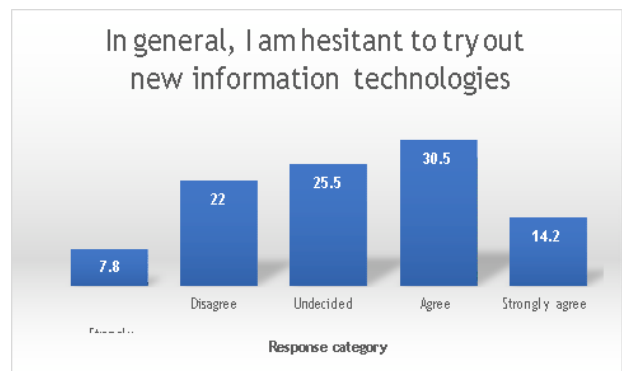


Figure 16. Frequency of responses (%) for the item: In general, I am hesitant to try out new information technologies

About 45% of the participants were hesitant to try out new information technologies. About 25% of the participants were not sure whether they were hesitant to do so. About 30% of the participants were not hesitant to try out new information technologies.

- 4) I like to experiment with new information technologies:** The percentage responses obtained for this item of the survey are given in figure 17.

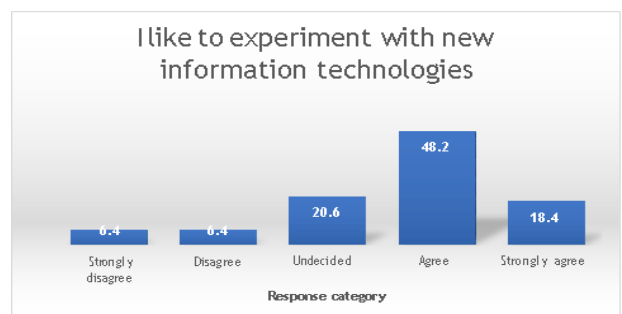


Figure 17. Percentage responses to the item: I like to experiment with new information technologies

About 67% of the respondents liked to experiment with new information technologies. About 21% were unsure about it. The remaining 12% did not like to experiment with.

Continuous intention to use (CITU)

The frequencies of responses for items under this scale are described below:

- 1) **Given the chance, I intend to continue using MOOCs:** The percentage response frequencies for this item are presented in figure 18.

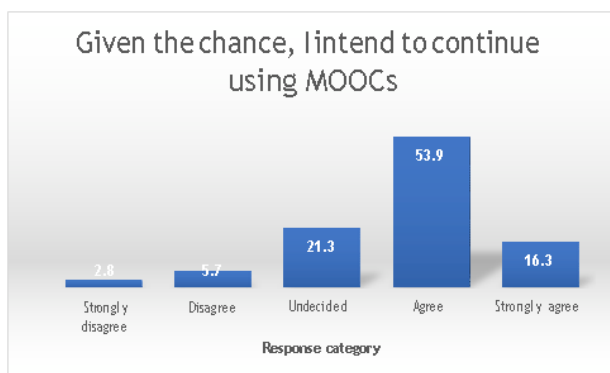


Figure 18. The frequency percentages of response to the item: Given the chance, I intend to continue using MOOCs

About 70% of the survey participants intended to continue using MOOCs if they get a chance. About 21% were unsure of it. The remaining 9% did not want to continue using MOOCs even if they are given a chance.

- 2) **Given the chance, I predict that I should continue using MOOCs:** The percentage response frequencies for the item are given in figure 19.

About 75% of the survey participants were willing to predict that they will continue to use MOOCs if the chance was given to them. About 18% of the respondents could not say so. The remaining 7% were unwilling to predict that they will continue to use MOOCs if they were given the chance.

Table 6. Descriptive statistics of the scales of the survey.

Scale	N	Minimum	Maximum	Mean	Std Dev
PU Score	141	1.00	5.00	3.80	0.76
PEOU Score	141	1.00	5.00	3.71	0.76
PIIT Score	141	1.00	5.00	3.50	0.75
CITU Score	141	1.00	5.00	3.79	0.78

Numerically, the mean rating for PU was nearest to 4 (3.8), followed by CITU (3.79) and then by PEOU (3.71). Only the mean value of PIIT was much lower at 3.5. The standard deviations of all scales were almost similar ranging from 0.75 to 0.78.

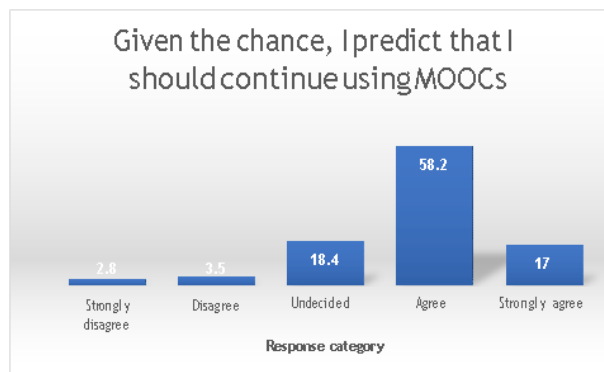


Figure 19. Response percentages for the item: Given the chance, I predict that I should continue using MOOCs

- 3) **Given the chance, I plan to continue using MOOCs:** The percentage responses for this item are given in figure 20.

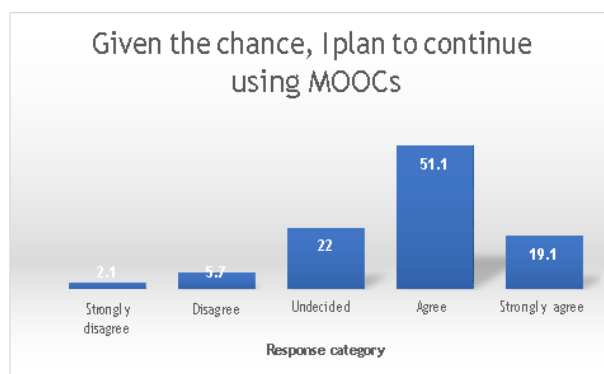


Figure 20. Percentage responses for the item: Given the chance, I plan to continue using MOOCs

3.3 The Combined Results

The summary statistics of all the four scales are given in Table 6.

All mean values were above 3.0, which is the mid-point of the Likert scale of 1 to 5. A rating of 3 represents the undecided option toward the item statement. A rating of 4 represents an agreement with the item statement. Since the mean values of all scales were above 3, but below 4, there is only a tendency toward agreeing to the item statements.

3.4 Hypotheses Testing and Validation

Pearson’s correlation coefficient was used for testing the four hypotheses. The cross-tabulation of the correlation matrix is presented in Table 7.

Table 7. Pearson’s correlation matrix for the scales used in the survey

Scale	Experience with MOOC ranked	PU	PEOU	PIIT
PU Score	-0.012			
PEOU Score	0.048	0.802**		
PIIT Score	-0.104	0.596**	0.605**	
CITU Score	0.037	0.765**	0.783**	0.642**

** Significant at 0.01 level.

In the research model presented in the methodology chapter, there were two TAM factors. These were perceived usefulness (PU) and perceived ease of use (PEOU). One more variable from the literature, Personal Innovativeness In Information Technology (PIIT) was added to these two variables. All these three independent variables were considered as the factors influencing the dependent variable, which was Continuous intention to use MOOCs. This theoretical framework was used for the formation of the four hypotheses in this study. The correlation coefficients presented in Table 7 show that all the hypotheses have been verified. This is explained below.

- 1) H1-Perceived usefulness will have a positive impact on the user’s continuous intention to use MOOCs. The significant positive correlation between PU and CITU ($r=0.765$, $p<0.01$) demonstrated the positive impact of perceived usefulness on the continuous intention to use MOOCs by Saudi students. Thus, H1 has been verified.
- 2) H2-Perceived ease of use will have a positive impact on the user’s continuous intention to adopt MOOCs. There was a significant and positive correlation between PEOU and CITU ($r=0.783$, $p<0.01$) as shown in Table 3. Therefore, H2 has been verified.
- 3) H3-There is a positive relationship between perceived usefulness and personal innovativeness in information technology. The correlation coefficient was 0.596 ($p<0.01$) between PU and PIIT. Hence this hypothesis has been verified.
- 4) H4-There is a positive relationship between perceived ease of use and personal innovativeness in information technology. A significant positive correlation between PEOU and PIIT ($r=0.605$, $p<0.01$) shows that this hypothesis has been verified.

Thus, all four hypotheses formed in this study have been verified by the results obtained from the survey.

4. DISCUSSION

All four hypotheses were validated by the findings of this study. Therefore, the Saudi students in Australia were willing to continue using MOOCs, the skills which were acquired by them during their education in Australia. Such readiness to use MOOCs was due to the highly efficient teaching methods of Australian

universities and the high learning abilities of Saudi students (Alario-Hoyos et al., 2017).

The representativeness of the sample on the student population in Saudi Arabia was very different. According to the data published by the General Authority of Statistics (GAS, 2020), the maximum number of youths was in the age group of 15-34 years (36.7%). In this study, the percentage of students in the age group of 18-34 was 67.4%. In the same report, males were 51%. In this study, the males were 82.3%. Thus, the survey sample does not represent the student population in Saudi Arabia. In the case of the Saudi student population in Australia, 21.6% of them were females in 2016 (Larkins, 2018), roughly agreeing with 17.7% of females among the survey participants of this study. According to (AU Department of Home Affairs, 2016), 71% of Saudi students in Australia were in the age group of 15-44 years, matching well with the 67.4% of students in this age group among the survey participants in this study. Thus, although the gender and age profiles of Saudi students in Australia do not match their profiles back home, they agree with the population of Saudi students in Australia.

A large majority of Saudi students were satisfied with MOOCs, as they perceived MOOCs were useful and easy to use. Therefore, they were willing to continuously use MOOCs and even prepared to try out new information technologies. This is an indication of high levels of satisfaction leading to the intention to use MOOCs continuously, as was observed by Chen et al (2018). Satisfaction with one technology can lead to hesitation to try any new technology as they feel they are in the safe zone with the current technology. The hesitation of some students to new information technologies can be attributed to this possibility (Ellen, Bearden, and Sharma, 1991), passive resistance to new technologies, or gaps between what was expected and what was offered by MOOCs. If there was no such gap, it encourages continuous use of MOOCs, as was noted by Griffiths, Mulhern, Spies, & Chingos (2015). Other possible reasons for resistance to the use of MOOCs continuously are incompatibility between technologies and lack of visibility of the technology used in MOOCs. The TAM framework adopted for this study has been endorsed by many authors including Yang et al (2017) and Wu & Chen, (2017). As was found in this study, perceived usefulness could be correlated with continuous intention to use MOOCs.

Correlation coefficients were used to validate the four hypotheses in this study. Such relationships between PU, PEOU and intentions to use MOOCs were reported by (Joo, So, & Kim, (2018) and Wu and Chen (2017). Like the results of this study, relationships between PU and PEOU with PIIT were reported by Lu, Yao, and Yu (2005) and by Parveen and Sulaiman (2008), in the case of wireless technologies.

Thus, Saudi students in Australian universities have accepted MOOCs. Now they need to facilitate its adoption by university students in Saudi Arabia, as a part of the efforts to achieve Saudi Vision 2030 goals, as MOOCs can contribute to its achievement (Almuhanna, 2018).

Alaqsam & Ghabban, (2021) observed that about 94% of Saudi university students accepted to use MOOCs for learning computer science courses. But 70% of them have never used any MOOC so far. Therefore, a lot of work on the adoption and use of MOOCs is required to cover all university students in Saudi Arabia. Contradictory results were reported in the studies of Altalhi (2021, using the UTAUT model) and Suki and Suki (2011) on the adoption of MOOCs by Saudi university students. However, Altalhi M. M. (2021) found that performance expectancy (PU) and effect expectancy (PEOU) influenced the adoption of MOOCs by Saudi university students. Largescale use of MOOCs by Saudi citizens was already in practice according to Almuhanna (2018). Women used them more for flexibility in learning as they have household duties also.

5. CONCLUSIONS

This study aimed at the validation of four hypotheses relating PU, PEOU and PIIT with intention to use MOOCs continuously. The results of 141 survey responses yielded many useful results.

A large majority of Saudi students had the experience of using MOOCs at least for three months. They were more likely to be male students in the age range of 25 to 44 years, studying almost any course in Australian universities. Most students (65-75%) found MOOCs helping them to accomplish their tasks easily, quickly, and more effectively, thus improving their task performance and productivity. Thus, MOOCs were useful for their learning tasks. These learning benefits were due to their perception that MOOCs were clear, easier to understand and operate, and flexible to interact with, allowing them to get MOOCs to do what they

wanted to do, thus being in full control of MOOCs while they used them for their learning tasks. These advantages made them think that MOOCs were easy to use and that they could easily become skillful to use MOOCs. They extended these perceptions of MOOCs to try out, experiment and experience new information technologies as soon as they heard about any of them. Many of them wished to be the first among their peers to try out new information technologies. However, there were a sizeable number of Saudi students, who were hesitant to try new information technologies. Overall, given the chance, a large majority of Saudi students were willing to predict, plan and intend to use MOOCs continuously.

Pearson's correlation coefficients validated all four hypotheses of this study. Thus, the aim of this research was achieved.

Saudi students returning to their home country are expected to facilitate large-scale adoption and use of MOOCs by Saudi university students. The use of MOOCs can help to achieve the Vision 2030 goals. The challenges and problems in doing so need to be addressed with the help of the university administration and the Ministry of Education.

MOOCs are effective tools for online learning, especially when catastrophes like covid strike. Any resistance to this needs to be dealt with strongly, as it affects the health of several people.

More positive attitudes toward MOOCs from students, faculty and university management, the Ministry of Education and the government are recommended for the successful adoption and continuous use of MOOCs in Saudi Arabia. More research on the design and development of MOOCs compatible with the Saudi context is also recommended.

Limitations:

- 1) Only TAM was used. Other technology acceptance models like UTAUT could also be used.
- 2) The hesitation of some students in using MOOCs and trying new information technologies needs to be probed further. Now this is explainable only by using other works.
- 3) The relationship of demographic variables with the intention to use MOOCs continuously would have identified some predictors. This would have also helped in identifying resistors of its use and finding solutions.

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