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A Study on Influence of Web Quality and Self Efficacy on Massive Open Online Courses (MOOCs) Technology Adoption by Extending the Utaut Model with Reference to Student MOOC Users

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Abstract
Massive Open Online Courses (MOOCs) is one of the most innovative ideas in modern learning methods. It helps people for autonomous study and to share globally excellent learning resources. Despite of many advantages in adopting MOOCs, many research studies have indicated that majority of MOOC users discontinues the course whose intentions of users are not clearly known. The purpose of this research is to find the influence the Web Quality (WQ) and Self Efficacy (SE) on massive open online courses technology adoption by extending the UTAUT model. Two new constructs Web Quality (WQ) and Self Efficacy (SE) were added to the existing UTAUT model constructs Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Facilitating Conditions (FC) and the behavioural intention to use MOOC is determined as per the model. The study was conducted among college students who use MOOC and hence the sampling technique used was purposive sampling. The statistical tools used for analysis of the data are cross-tabulation, regression and for this SPSS software was used. The research revealed that web quality (WQ), and Self efficacy (SE) has significant influence on behavioural intension to use MOOC. The implication of this research is that the service providers get more light on the important factors which influence the behavioural intention to use MOOCs and to know the technology acceptance of MOOC.

Keywords: UTAUT, MOOC, Behavioural Intention, Web Quality, Self Efficacy (SE).

Introduction

India is a pluralistic country of over 1.3 billion people. An individual in 21st century is expected to be highly educated and skilled and to continually improve their qualities by engaging themselves in lifelong learning. E-learning is defined as learning and teaching through network technologies via online and is arguably one of the most powerful responses to the growing need for need for knowledge and skills. In 19th century, the origin of internet has given birth to communication media changes drastically. The origin of internet has changed the traditional communications media in to digital communications media. The report released by IAMAI, by June 2018, the number of internet users will cross 500 millions. Urban population with a population of 455 million, nearly 295 million people are already using the internet.

Massive Open Online Courses (MOOCs) which can be considered as an advanced e-learning has started to grow and become popular. The Learners has got the opportunity to chose their interested subjects and topics which are open to all the MOOC users around the world.

Despite the fact that internet population is growing, MOOC are open to all MOOC users around the world, and technology based lifestyles are happening around, and technology adoption in each and every sector is increasing, there still remains a question what makes an individual adopt to new technology especially in e-learning, especially in a more advanced and customized web based learning like Massive Open Online Courses (e.g. Coursera, EdX, Udacity, NPTEL, etc). With the free access that MOOCs provide with its high-quality learning materials; it provides opportunity for individuals for self development regarding their interest area Abeer and Miri (2014), Kop and Carroll (2011). Therefore there is still lot of scope to do research and contribute to the development of MOOC platform with all the necessary changes as the learners expect.

There are several research studies to explain the adoption of technology by users. Few researches focus on the study of individual acceptance of technology, by using intention and actual usage as dependent variables. These researchers tested thirty-two variables of eight models – the Theory of Reasoned Action (TRA), the Technology Acceptance Model (TAM), the Motivation Model (MM), the Theory of Planned Behaviour (TPB), the Combined Model (TAM/TPB), the Model of PC Utilization (MPCU), the Innovation Diffusion Theory (IDT) and the Social Cognitive Theory (SCT) - in order to define which ones are more important on the influence of technology use. In an attempt to integrate the most important models and theories about the acceptance of ICT, Venkatesh et al created the UTAUT model. The aim of this paper is the attempt to present a extended UTAUT model which checks the significance of two new constructs Web Quality (WQ) and Self Efficacy (SE). The motivation of this research relates to the fact that, despite the benefits expected from the introduction Massive Open Online Courses (MOOCs), the acceptance of that platform by its potential users is, however, critical to its success.

Literature Review

Abel Usoro, Razep Echeng, (2015) in their research on "Model of acceptance of Web 2.0 technologies for increased participation in learning activities: A case study of a Scottish university" conducted to find the encouraging factor which leads to behavioural intention. The research results indicates that perceived usefulness, facilitating conditions, motivation, prior knowledge, performance expectancy and social factors are having significant relation with the use behaviour.

Ali Tarhini, Mahmoud Maqableh, Kamla Ali Al-Busaidi, Ra'ed Masa'deh, Ashraf Bany Mohammed, (2017) in their research developed a conceptual framework via incorporating additional constructs to the Unified Theory of Acceptance and Use of Technology (effort expectancy, price value, hedonic motivation, habit, performance expectancy, social influence, and facilitating conditions), which are self-efficacy and trust were taken. Data was collected from students of two universities and a cross-sectional questionnaire was circulated to the students and research was conducted. The findings of the research reveals that behavioural intention (BI) was significantly influenced by performance expectancy, social influence, habit, hedonic motivation, self-efficacy, effort expectancy and trust. The results was little unexpected that price value and facilitating conditions were found that they do not have significant influence on behavioural intention to use innovated technology.

Pedro Isaias, Jose Alberto Lencastre, Clara Coutinho, Francisco Reis (2017) in their reserch to examine the acceptance of mobile and distance learning. 79 students samples were involved. The result reveals that performance expectancy, effort expectancy were found to have significant influence on on the students attitudes. Regarding the social inflluence constructs, the infleuence on behavioural intention was found to be not significant. Regarding facilitating conditions, the influence on behavioural intention was foind that it does not have significant influence on behavioural intention. Regarding attitude in terms of technology, effort expectancy, performance expectancy, facilitating conditions considered were not relevant.

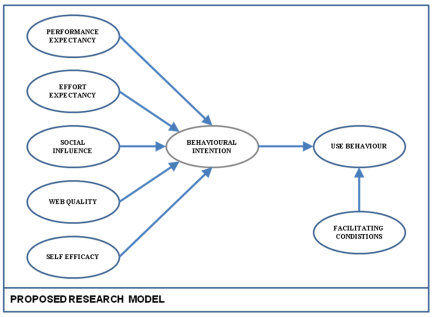
David Ong, Manimekalai Jambulingam, (2016) in their research to discuss the role of online learning, especially with regards to Massive Open Online Courses (MOOCs), for reducing costs regarding employee training and development. The findings reveals that many established organizations

have already implemented MOOCS and the main benefit of implementing the MOOC is that it saves cost which is incurred for employee training.

Il Im, Seongtae Hong, Myung Soo Kang (2011) examined the relationships UTAUT model and determined how they are affected by culture. The samples were taken from Korea and the U.S. The researcher concludes with the research that the UTAUT model fits well with the data. The result revealed that in the United States sample, the effort expectancy has significant influence on behavioural intention, and also the researcher found out that behavioural intention has significant influence on use behaviour.

Jian-Liang Chen (2011) questions that what are the factors which hs significnt infleunce a student's acceptance of electronic learning technologies is still unclear and has not been evaluated very well. The results shows that 4 primary factors facilitating conditions, performance expectancy, effort expectancy, social influence, and available in (UTAUT) are used to reflect the technological expectancy of students.

Proposed Research Model



Research Methodology

This research is conducted to identify the influence of Web Quality (WQ) and Self Efficacy (SE) on behavioural intention of MOOC users to adopt Massive Open Online Courses. The scope of the study is limited to college students who have undergone courses in Massive Open Online Courses (MOOC) like Coursera, EdX, Udacity, NPTEL etc. The research design used in this study is descriptive in nature. The Population for this study is Massive Open Online Courses users. The sample size for this study consisted of 168 students. A structured questionnaire was formulated and offline direct survey was done and the data were collected. The instrument used for collecting information from the respondents consisted of 2 sections. The first section consisted of demographic profile, and the second section of the questionnaire was regarding the core study of this research. Henceforth, the following objectives were framed to conduct the research.

Objectives of the Study

- To identify the Technology adoption variables influencing the adoption of Massive Open Online Courses (MOOCs).
- To identify whether Web Quality (WQ) and Self Efficacy (SE) has significant influence on behavioural intention to adopt Massive Open Online Courses (MOOCs).

Research Hypothesis

On the basis of above objectives, following hypotheses were framed to analyse the results of the research after performing a pilot study with 30 samples to find consistency of the samples.

$\mathbf{H_{o1}}$: There is no significant influence of UTAUT model Constructs on behavioural intention to adopt Massive Open Online Courses.

$\mathbf{H_{o2}}$: There is no significant influence of Self efficacy and Web Quality on behavioural intention to adopt Massive Open Online Courses.

Table Reliability of Technology Adoption Attributes

Technology Adoption Attributes	Cronbach's Alpha	Conclusion
Performance Expectancy (PE)	0.77	Reliable
Effort Expectancy (EE)	0.82	Reliable
Social Influence (SI)	0.76	Reliable
Facilitating Conditions (FC)	0.79	Reliable
Web Quality	0.84	Reliable
Self Efficacy (SE)	0.87	Reliable

Behavioural Intension (BI)	0.79	Reliable
Use Behaviour (UB)	0.73	Reliable

Table 2 Respondents Demographic Profile Analysis

Profile category	Sub-category	Frequency	%
Gender	Male	123	73.2
	Female	45	26.8
Age	18-22	103	61.3
	23-25	65	38.7
Education	Undergraduate	103	61.3
	Post graduate	65	38.7
Occupation	Student	168	100
	Very Poor	0	0
Computer knowledge	Poor	0	0
	Moderate	48	28.9
	Good	81	48.5
	Very Good	39	22.6
Internet knowledge	Very Poor	0	0
	Poor	2	1
	Moderate	24	14.2
	Good	91	54.4
	Very Good	51	30.4
Duration of usage of internet	Less than 1 year	0	0
	1-3 years	7	4
	3-5 years	22	13.2
	More than 5 years	139	82.8
Usage of internet per day	Less than 1 hour	4	2.5
	1-2 hours	19	11.3
	2-3 hours	35	20.6
	More than 3 hours	110	65.6
MOOC Experience in years	Less than 1 year	97	57.8
	1-3 years	51	30.4
	3-5 years	14	8.3
	More than 5 years	6	3.4
Frequency of MOOC usage	Daily	11	6.4
	Weekly	52	30.9
	Monthly	105	62.7
Place of accessing MOOC websites	Home	146	86.8
	Workplace	16	9.8
	Cybercafe	6	3.4

Table "T" Test on Technology Acceptance Independent Variables and Behavioural Intention of Massive Open Online Courses (MOOCs) Student Users

Coefficients[a]					
Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	.941	.343		2.746	.006
Performance expectancy	.120	.032	.209	3.809	.000
Effort expectancy	.086	.027	.161	3.181	.002
Social influence	.069	.024	.106	2.933	.003
Website quality	.064	.026	.140	2.500	.013
Self efficacy	.110	.020	.265	5.590	.000

a. Dependent Variable: Behavioural Intention

Findings

Reliability Test

Cronbach's Alpha is designed as a measure of internal consistency of items in the questionnaire. It varies between zero and one. The closer alpha is to one, the greater the internal consistency of the items in the questionnaire. An analysis of the table -1 reveals that Performance expectancy (PE), Effort expectancy (EE), Social Influence (SI), Facilitating conditions (FC), Website quality (WQ), Self efficacy (SE), Behavioural Intension (BI), and Use behaviour (UB) has a internal consistency cronbach's alpha value of 0.77, 0.82, 0.76, 0.79, 0.84, 0.87, 0.79, and 0.73 respectively which are all greater than 0.6 and hence all the constructs and their corresponding items have acceptable level of internal consistency. Hence reliability of the items has been verified using cronbach alpha test.

Demographic Profile

An analysis of table 2 reveals that the respondent's are completely Undergraduate students totalling a sum of 168 in numbers. Out of 168, 123 (73.5%) respondents are male, and 45 (26.5%) respondents are female. Further the age group of the respondents are under 30 years of age. To be very specific, 103 (61.3%) respondents are in the age group of 18-21, and 65 (38.7%) of the respondents are in the age group of 22-25.

Technological Knowledge of the Respondents

An analysis of table 2 reveals that

- Regarding the computer knowledge of the respondents, no respondents were in the "very poor" and "poor" category, whereas the respondents in the Moderate, Good, and Very Good category are 48, 81, 38 in numbers and their percentages are 28.9, 48.5, and 22.6 respectively.
- Regarding the internet knowledge of the respondents, no respondents were in the "very poor" category and 2 respondents are the poor category which is just 1% of the overall respondents, whereas the respondents in the Moderate, Good, and Very Good category are 24, 91, 51 in numbers and their percentages are 14.2, 54.4, and 30.4 respectively.
- Usage pattern of the respondents: An analysis of table 2 reveals that
- Regarding the internet usage, none of the respondents are having below 1 year internet usage, 7 respondents are using the internet for 1-3 years duration. The analysis reveals that 22 respondents (13.2%) are having the internet usage experience of 3-5 years and whole majority of the 139 respondents (82.8%) are having internet usage experience of more than 5 years.
- Regarding the Usage of internet per day, 4 respondents (2.5%) use internet less that 1 hour per day, 19 respondents (11.3%) use internet for 1-2 hours per day, 35 respondents (20.6%) use internet for 2-3 hours per day, 110 respondents (65.6%) use internet for more than 3 hours per day.
- Regarding the MOOC experience, 97 respondents (57.8%) are having below 1 year MOOC experience, 51 respondents (30.4%) are having

the MOOC experience for 1-3 years duration, 14 respondents (8.3%) are having the MOOC experience of 3-5 years and 6 respondents (3.4%) are having MOOC experience of more than 5 years.

Frequency of MOOC usage of the Respondents

An analysis of table 2 reveals that

- 11 respondents (6.4%) use MOOC daily, 52 respondents (30.9%) use MOOC weekly, 105 respondents (62.7%) monthly.

Place of accessing MOOC Websites by the Respondents

- An analysis of table 2 reveals that 146 respondents (86.8%) access MOOC website at home, 16 respondents (9.8%) access MOOC website at work place, 6 respondents (3.4%) access MOOC website at cybercafé.
- Regression analysis of Independent variables to Behavioural Intention:
- An analysis of the table- 3reveals that the respondent's Performance expectancy (PE) t-value of 3.809 with the significance of 0.000. Performance expectancy (PE) variable is significant at 5% level. Hence null hypothesis is rejected and alternate hypothesis is accepted. That is there is a significant influence of performance expectancy (PE) on behavioural intention of MOOC users.
- An analysis of the table- 3reveals that the respondent's Effort expectancy (PE) t- value of 3.181 with the significance of 0.002. Effort expectancy (PE) variable is significant at 5% level. Hence null hypothesis is rejected and alternate hypothesis is accepted. That is there is a significant influence of Effort expectancy (PE) on behavioural intention of MOOC users.
- An analysis of the table- 3reveals that the respondent's Social Influence (SI) t- value of 2.933 with the significance of 0.003. Social Influence (SI) variable is significant at 5% level. Hence null hypothesis is rejected and alternate hypothesis is accepted. That is there is a significant influence of Social Influence (SI) on behavioural intention of MOOC users.
- An analysis of the table- 3reveals that the respondent's Website Quality (WQ) t- value of 2.5 with the significance of 0.013. Website Quality (WQ) variable is significant at 5% level. Hence null hypothesis is rejected and alternate hypothesis is accepted. That is there is a significant influence of Website Quality (WQ) on behavioural intention of MOOC users.
- An analysis of the table- 3reveals that the respondent's Self efficacy (SE) t- value of 5.590 with the significance of 0.000. Self efficacy (SE) variable is significant at 5% level. Hence null hypothesis is rejected and alternate hypothesis is accepted. That is there is a significant influence of Self efficacy (SE) on behavioural intention of MOOC users.

Since all are <0.05, Performance expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Website Quality (WQ), and Self Efficacy (SE) are significant at 5% level. Hence null hypothesis rejected and Alternate hypothesis is accepted. That is Performance expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Website Quality (WQ), and Self Efficacy (SE) and Behavioural Intention to adopt MOOCs are interrelated.

Conclusions and Recommendations

- Henceforth it is concluded that male respondents contributions are higher than female respondents for the research
- In fact from the total collected samples majority of the respondents 100% have "moderate" to "very good" Computer knowledge. Hence there is lot of scope for the e-learning service providers to penetrate in to the MOOC service offering platform as the respondents are having a reasonably good computer knowledge.
- In fact from the total collected samples majority of the respondents 100% have "moderate" to "very good" Internet knowledge. The internet knowledge of the respondents has great advantage to the e-learning service providers to straight away concentrate on creating e-learning content.
- From the total collected samples, the usage of internet per day by the respondents details indicates that 145 (86.2%) of the respondents use internet more than 2 hours per day. This shows the internet is becoming affordable and making respondents rely on internet for all the activities

in their life.

- From the data interpretation of MOOC experience of respondents, it clearly gives a hint and makes a point to the service providers that despite the higher level of computer knowledge, internet experience, and usage pattern of the respondents, the MOOC experience of the respondents are quite reciprocal and drastically opposite to the computer and internet knowledge of the respondents.
- Performance expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Website Quality (WQ), and Self Efficacy (SE) are significant at 5% level. Hence the MOOC service provider must concentrate on Performance expectancy (PE), Effort Expectancy (EE), Social Influence (SI), Website Quality (WQ) variables.

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