



## Implementation of MOODLE online examination system with the Moodle\_Quiz\_V09 template in the context of technology acceptance model and learning management system

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### Abstract

A learning management system (LMS) is an educational framework used to plan, implement, and assess a specific learning process which is specially used for e-learning education courses or training programs. We begin with the argument that the Technology Acceptance Model (TAM) is more applicable in predicting intention to use and usage for users than non users. This paper looks at the acceptability of TAM in predicting intention to use MOODLE Online Examination System among current users and future users where MOODLE is a learning platform designed to provide educators, administrators and learners with a single robust, secure and integrated system to create personalised learning environments. The place of the study was based on a Pvt. Management College of Kolkata, West Bengal, India and sample size was 55. For conducting the Online Examination in MOODLE platform, sample questions along with the correct answers has to be uploaded in the MOODLE local server with a few supported specific formats like – Aiken format, Gift format, Black board format, WebCT format or MOODLE XML format etc. Now it is a tedious job among the Faculty members of different departments to submit all the questions along with the appropriate answers with that specific MOODLE supported format, specially for whom who does not have so much experience in IT or Web based Technology. To resolve the problem, we practically implemented a template (namely Moodle\_Quiz\_V09) in the MOODLE platform which specifically can convert any .doc format (simple Word format) questions to MOODLE XML format. After conversion of such a questionnaire, a mock test was conducted to test the acceptability of the template. Based on the practical implementation, a proposed theoretical framework has been designed from the original TAM Model. A pilot survey was conducted among the 55 Faculty members of the College to collect their feedback and incorporated the same into the proposed framework which shows the acceptance of MOODLE Online Examination system with the specified Moodle\_Quiz\_V09 template.

**Keywords:** LMS, TAM, MOODLE, Perceived Usefulness, Perceived Ease of Use, Attitude towards usage.

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## 1. Introduction

The greater acceptability of Information and Communication Technology (ICT) creates a new paradigm for education sector known as e-learning. Therefore, Universities around the World have started to revise and remodeling their strategies in order to adopt new technologies that assist in achieving their pedagogical goals (Bousbahi & Alrazgan, 2015). One of the ICT tool that is used into educational sector is called a learning management system (LMS), and from now it is abbreviated as LMS (Islam & Azad, 2015). In current era, MOODLE is one of the most emerging LMS that is used in educational sector which is basically an open source software developed by an Australian Scientist, Martin Dougiamas (Dougiamas, 2004). Today, MOODLE has attracted a long list of developers devoted to MOODLE improvements. An effective implementation of MOODLE should highly consider academics who will use such systems for teaching learning pedagogy. The objective of this study is to develop a theoretical framework based on MOODLE online examination which supports the TAM Model. The model is applied in a Kolkata based Pvt. Management College for assessment of the student's midterm test. The proposed model will help the future researcher of West Bengal, India who specially wants to work on MOODLE platform.

## 2. Literature Review

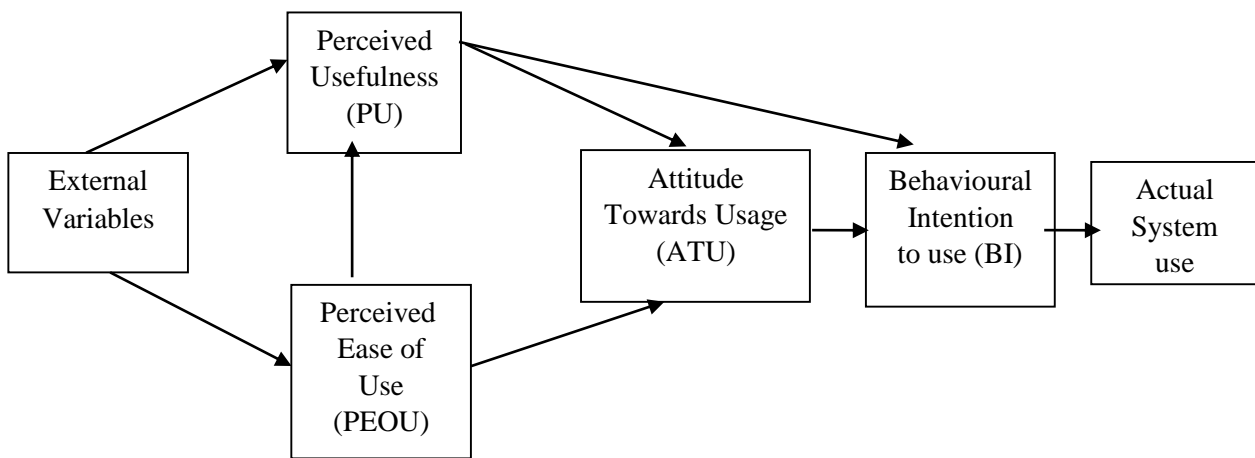
In Eastern India, specifically in West Bengal, most of the Universities or Educational Institutes still maintain the manual procedures for Examination purpose. So, the potential users of LMS especially the users of MOODLE are not considered (Haddad, 2018). It has been noticed that except few pioneer Educational Institutes like IIM Calcutta OR IIT Khargapur who have already implemented the LMS system successfully in their Educational system, other Institutes are far behind to do so, rather they believe to follow the conventional approach. As this study was conducted in one of the popular Private Management College in Kolkata, West Bengal, technology integration in teaching within this context could consequently be affected by Organizational arrangement. Further, facilitating conditions in which academics would be likely to have more resources and assistance would affect the intention to use the system as they will receive the required support when they need. Finally, it is noted that this study focuses only on MOODLE online examination featured within learning management systems that were provided to academics and students prior to the study (Polhun et al., 2021). This study was based on the midterm test feedback among several departments of the College and the proposed theoretical framework was constructed based on well-known theories—namely, Technology Acceptance Model (TAM) (Davis, 1989).

## 3. Framework of TAM

The Technology Acceptance Model (TAM) (Davis, 1989) provides a conceptual framework for this study. Based on theories in social psychology, including the theory of reasoned action (TRA) (Ajzen and Fishbein, 1980) and the theory of planned behavior (Ajzen, 1985) where TAM proposes that two beliefs about a new technology, perceived usefulness (PU) and perceived ease of use (PEOU), determine a person's attitude toward using that technology (ATU), which in turn determine their behavioral intention (BI) to use it (Das and Majid, 2020). TAM model tells external variables (e.g. System experience, level of education, age etc.) determines both PEOU and PU where PEOU directly determines PU and if they have a strong correlation then both PEOU and PU determines ATU, whereas PU directly determines BI. Finally, BI determines actual system in use.

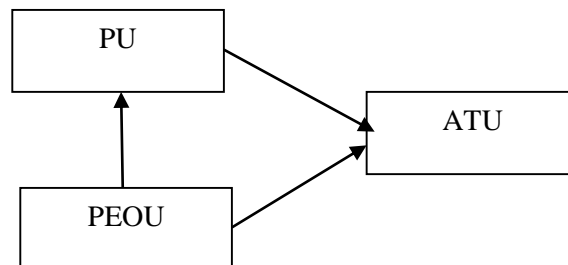
## 4. Research Model and Methodology

### 4.1. Proposed Research Model



**Fig. 1. Original TAM Model**

For the purpose of our research we have excluded the external variables, Behavioral Intention to use and Actual System in use from the original TAM Model (Davis, 1989). The reason why we stopped at Attitude towards usage is because the MOODLE online Examination is a new phenomenon in the College, so constraints were lack of sufficient resources and lack of system experience. The proposed research model is as shown in Figure 2.



**Fig. 2. Proposed Research model based on Original TAM Model**

### 4.2. Methodology

The study was conducted in Kolkata, West Bengal, India and it was quantitative in nature and employs an online survey for data collection. Here we have collected 55 Faculty members feedback for our research purpose. Now it was a tedious job and time consuming process, but it was possible due to the data were collected only from one college. The pilot survey was developed through a structured questionnaire which elicited information about Perceived ease of use (PEOU), Perceived usefulness (PU) and Attitude towards use (ATU) for examine the relationship between variables proposed in the research model. Respondents were asked to rate their opinion using a 5-point Likert scale ranging from 1=strongly disagree, 2=Disagree, 3=neither disagree nor agree, 4=Agree and 5=Strongly agree, and based on the respondent's rating we tried to determine the correlation between Perceived ease of use (PEOU) and Attitude towards use (ATU), similarly correlation between Perceived usefulness (PU) and Attitude towards use (ATU) which is depicted in the below Table 1.

**Table 1. Results of Questionnaire analysis**

<b>Section 1: Perceived Ease of Use (PEOU)</b>	
It would be easy to use Moodle_Quiz_V09?	PEOU1
Do you think interaction with Moodle_Quiz_V09 is clear and understandable to you?	PEOU2
Do you believe that it would be easy to become skillful at using Moodle_Quiz_V09?	PEOU3
Do you think after using of the template it is ease to submit the questions for online examination?	PEOU4
<b>Section 2: Perceived Usefulness (PU)</b>	
Using Moodle_Quiz_V09 template in your job would enable you to accomplish tasks more quickly?	PU1
Using this template would improve your job performance?	PU2
<b>Section 3: Attitude Towards Use (ATU)</b>	
Do you believe it is a good idea to use a Learning Management System in MCKV College?	ATU1
Do you agree that it is a positive idea to use Moodle_Quiz_V09 template in MOODLE platform for online exam?	ATU2

## 5. Findings

In this study, the questionnaire reliability assessment was done using Statistical Package for Social Sciences (SPSS) (Grice & Harris, 1998). From the respondent's feedback ratings and based on the proposed variables as input values in SPSS, factor values are determined. Common Factor model proposes that each observed responses (PEOU1 to PU2) was influenced partially by underlying common factors (Factor 1 & Factor 2) which are extracted based on their Eigen values. Then varimax rotation (Henry, 1958) was applied to get factors that are as different from each other as possible, which prove the uniqueness of each factor. The results of SPSS showed a two factor solution with Eigen values greater than 1.0 and the total variance explained of 60.917%. The Kaiser-Meyer-Olkin (KMO) value was used to determine the appropriateness the data sets for the factor analysis where the interpretive adjectives for the KMO of Sampling Adequacy are: in the 0.90 as marvelous, in the 0.80's as meritorious, in the 0.70's as middling, in the 0.60's as mediocre, in the 0.50's as miserable, and below 0.50 as unacceptable. Here our KMO measure of sampling adequacy was 0.751 indicating as middling and thus sufficient inter correlations between the PEOU and PU determinants. It is depicted in Table 2.

**Table 2. Results of Factor Analysis**

Items	Factor 1	Factor 2
PEOU1	<b>0.871</b>	0.012
PEOU2	<b>0.683</b>	0.315
PEOU3	<b>0.582</b>	0.309
PEOU4	<b>0.723</b>	0.070
PU1	0.173	<b>0.845</b>
Eigen value	2.224	1.131
Percentage variance	33.427	27.49
Mean	3.107	2.408
Standard deviation	0.54	0.64

In addition to the steps mentioned earlier to assess instruments' validity and reliability, a further test was performed. Reliability assessment was done using Cronbach Alpha (Cronbach, 1951). Reliability concerns internal consistency between multiple measurements of variables, and Cronbach Alpha is commonly used to measure it, which is described in Table 3.

**Table 3: Determinants Reliability Cronbach Alpha**

Scale	No of Items	Cronbach Alpha
Perceived ease of use	4	0.67
Perceived Usefulness	2	0.71
Attitude towards usage	2	0.73

#### **Hypotheses for Model variables:**

A) PEOU positively affects ATU which is shown in Table 4.

**Table 4. Correlation between PEOU and ATU**

Correlations		
PEOU	Factors	ATU
	R value	0.556
	P value	0.001
	N	55

B) PU positively affects ATU which is shown in Table 5.

**Table 5. Correlation between PU and ATU**

Correlations		
PU	Factors	ATU
	R value	0.761
	P value	0.001
	N	55

## 6. Research Limitations

This study is not free of limitations. Further, the findings of this study may not be greatly generalized for various reasons. First, the survey was based on only one College and the result suggests that the sample size should be increased, as a higher sample size would help to make the conclusion more general. In addition, the research framework was designed to be used with MOODLE format not in other open source LMS format. Regression analysis was not considered in the research study which can be incorporated in the future work. The research was focused only on faculty members and excludes students due to time constraints and lack of resources.

## 7. Conclusion and Implications

The current study modified TAM mainly to validate the relationship between the TAM core constructs as well as the effects of moderators proposed with this study. Overall, the statistical analysis shows that the findings of the current study are consistent with the original TAM findings. All TAM-related hypotheses within this study were proven to have positive correlations that are statistically significant. Moreover, the faculty members were involved in this study showed a positive attitude towards MOODLE online examination, and they intent to use Moodle\_Quiz\_V09 in their future work. As expected, when academics perceived Moodle\_Quiz\_V09 as easy to use, they developed a positive attitude towards utilizing it. Similarly, the PU increased the degree of positivity toward usage, which subsequently affected the behavioral intention to use. Most significantly, this study could benefit the College staffs to adopt e-learning technologies and open source LMS for their teaching learning pedagogy.

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