Assessment of Facilitating Conditions Influencing the Adoption of Students’ Information System in Higher Learning Institutions

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Abstract

This research study aimed to assess facilitating conditions that influence the adoption of MOODLE system in higher learning institutions. This research paper generally explores facilitating conditions influencing the adoption of MOODLE students’ information system by measuring assistance with any system difficulties, system compatibility, and knowledge for system usage, required resources and technical support. This study used a Simple random sampling technique to obtain a total of 97 respondents from a population of about 3,000 students of Institute of Accountancy Arusha (IAA); a questionnaire was used as a method of data collection and the analysis of data involved the use of descriptive results that based on measured variables, the use of correlation analysis to determine relationship between dependent and predictor variables, ANOVA was also used to test the significant fit of the model and also regression analysis was conducted to show the significant relationship between the variables. Study findings revealed that 42.3% of the respondents agreed that they usually get specific person to assist them with any system difficulties, 43.3% supported for compatibility of MOODLE system being the same to the alternative platforms used to facilitate learning, 42.3% agreed to have enough knowledge on proper utilization of the system, the same percentage 42.2% of the respondents agreed and at the same vein opposed that the institute provides required resources for the adoption of MOODLE system. Additionally, 50.5% of the respondents agreed that the institute provides technical support for the adoption of the system even when they are outside the campus. On the basis of findings for this study, facilitating conditions influencing the adoption of MOODLE system encourage students in their learning environment as the challenges encountered are urgently solved by responsible personnel. Based on these findings, students of higher learning institutions should acknowledge on efforts made towards the assistance with any system difficulties, system compatibility, and knowledge for system usage, required resources and technical support. However, the researcher proposes further studies to be carried out on similar study for the variables found to be insignificant to the adoption of students’ information system in higher learning institutions that will result to sustainable facilitation for students and the institutions of higher learning towards the adoption of MOODLE system.

Keywords: Assisting system difficulties, System compatibility, Knowledge for system utilization, required resources, Technical support.

I. Introduction

Technological adoption across the world has affected the institutions of higher learning in a way that has changed learning and teaching styles. Higher learning institutions make use of Information and Communication Technology (ICT) to conduct teaching and learning activities through the adoption of students’ information system such as MOODLE (AlQudah Ahmed, 2014). For smooth adoption of students’ information system, there should be some facilitating conditions as stated...
by Mtebe & Raisamo (2014) who defined facilitating conditions as the extent to which system users believe that technical infrastructures do exist in the institutions of higher learning to support them in their studies. The Institute of Accountancy Arusha (IAA) facilitate students through wired internet and wireless communication as well as provision of other facilities like computer labs equipped with computers and network resources. A research study conducted by Rumanyika & Mashenene (2015) strongly recommends that, the government of Tanzania has to take several measures in particular to support the complete adoption of students’ information system in higher learning institutions by taking serious measures for improving the ICT infrastructures. The Ministry of Education and Vocational Training (MoEVT) prioritized development of ICT in colleges by adding teaching and learning resources such as computer through joint venture with the Swedish International Development Agency (SIDA) (Chirwa, 2018). IAA students require technical supports from IT personnel responsible to the adoption of MOODLE system, Bhalalusesa (2013) concluded that there should be assistance for MOODLE users to help students solve the difficulties encountered during adoption of the system.

However study conducted by Joel (2015) suggests that for higher learning institutions to achieve the desired benefits they have to make usage of technologies in learning and teaching and have massive investment in these ICT projects. Additionally, research study conducted by Joel S. Mtebe & Raphael (2017a) put a recommendation that for successful adoption of students’ information system, the government of Tanzania and other partners should think on decreasing cost of internet usage to provide chance for the majority of MOODLE users to get easier access since the adoption of this system depends on powerful internet infrastructures. This idea is also supported by Joel S. Mtebe & Kondoro (2016) who specifically recommends that mobile phone companies should charge less for internet users pursuing studies so that the majority can get reliable internet access that influence the adoption of students’ information system for example THRDC (2020) advised mobile phone internet service providers to reduce internet and other service charges in light of Coronavirus (COVID-19) outbreak in Tanzania. Moreover, study findings by Joel S. Mtebe & Raphael (2017b) found that most of the students access MOODLE system by using their own resources like mobile phones and personal computers which can have positive influence for the adoption of students’ information system.

**PROBLEM STATEMENT**

Tanzanian higher learning institutions use MOODLE system for learning and teaching activities. MOODLE system uses internet infrastructure to help students receive and make submissions of assigned tasks at a given deadline. The institutions of higher learning were forced to move with technological change by adopting students’ information system to facilitate learning environment. The adoption of students’ information system is influenced by facilitating conditions well defined by Kasse John Paul et al. (2015), as the extent to which students believe that the institutions of higher learning and technical infrastructures are existing to provide support for the adoption of students’ information system. Studies have been conducted to assess the influence of facilitating conditions for the adoption of MOODLE system in higher learning institutions in Tanzania. However, there are limited studies taken to measure facilitating conditions for the adoption of students’ information system, therefore this study aimed to assess facilitating conditions based on the following measurable variables:

i. Assistance with any system difficulties
ii. System compatibility
iii. Knowledge for system usage
iv. Required resources
v. Technical support.
ii. Literature Review

Higher learning institutions require facilitating conditions for the adoption of students’ information system in higher learning institutions. Alwahaishi & Snášel (2013) defined facilitating conditions as the extent to which students in higher learning institutions believe that the existence of ICT infrastructures in their learning environment support them for the adoption of MOODLE which help them to achieve their targets.

This research paper extracted facilitating conditions from one among the constructs of Unified Theory of Acceptancy and Use of Technology (UTAUT) to assess facilitating conditions that influence the adoption of students’ information system in higher learning institutions. This assessment was carried out by using measurable items; assistance with system difficulties, system compatibility, knowledge for system utilization, required resources and technical support.

Accordingly, Raphael & Mtebe (2016), conducted study that recommends the use of mobile MOODLE system for the adoption in higher learning institutions and this came into being given the majority of students and teachers possess smart phones with reliable internet access. Arguably, study carried by Miadinovic & Xiang (2016) found that facilitating conditions gives the necessary supports to students in pursuing their studies and also encourages students to adopt MOODLE for their common purposes.

Accordingly, the study conducted by Ekundayo (2019), found that facilitating conditions have significance and actual influence for students’ behavioral intention to use the MOODLE system and also the same study suggests that provision of technical and supportive infrastructures influence the willingness of students to adopt MOODLE system for their consumptions. Another study aimed on monitoring students at university area was conducted by Sáiz-Manzanares et al. (2020), which later found that MOODLE system facilitates the follow up of students’ participation in academic activities.

Moreover, literatures indicate that facilitating conditions produce a positive influence where there’s continuous intention of using MOODLE system (Lwoga & Komba, 2014), the same study also argues that better perception of students for institutions’ ICT resources and the overall infrastructure helps to acquire continuous and speedy adoption of MOODLE system. A study by Azizi et al. (2020), suggests that for successful adoption and implementation of students’ information system under blended learning, there should be infrastructural readiness for ICT, clear supportive policy and proper planning. Another study taken by Tajudeen et al. (2015), strongly recommends for management support for successful adoption of students’ information system in higher learning institutions.

Accordingly, prior studies recommend that the higher learning institutions need to increase bandwidth for internet access for students and staff given that MOODLE system adoption depends on internet infrastructures in particular for example by (Salhab, 2019) which on the other hand emphasizes to improve the learning and teaching by increasing MOODLE efficiency. MOODLE system provides students with real time support when they come to have anything that needs clarifications from their module facilitators, concluded by Amandu et al. (2013) who also stated that MOODLE system helps students to exchange information between one another through cat options.

However, study by Cabero-Almenara et al. (2019), observed that there’s low rate of responses regarding the activities that involve the use of MOODLE platform and therefore the same study suggests that the institutions of higher learning should have defined guidelines that govern the adoption of MOODLE systems in their institutions in presence of multiple factors.

Furthermore, previous studies delivered recommendations for the adoption of students’ information system. Study conducted by Andrews & Daly (2008), recommends for provision of a get started guide at the homepage of the MOODLE system that helps students to overcome the
difficulties that may be encountered. The recommendation made by Al-Azawei et al. (2016), requires the institutions of higher learning to have systematic strategy that can be taken for the implementation that leads to successful adoption of MOODLE system.

iii. Methodology

In this research paper, qualitative and quantitative research approach were used for data analysis and integration of research findings. The use of mixed approach in this study aimed at Assessing facilitating conditions that influence the adoption of students’ information system in higher learning institutions that specifically based on five measurable variables which are well identified in the problem statement for this study. This research work selected IAA as the only one case study for this research work, with reason that the adoption of students’ information system facilitates students in acquiring their specific targets through receiving and submission of class assessments. This adoption attracts a research to assess facilitating conditions that result on the adoption of students’ information system in higher learning institutions.

This research work obtained required respondents by using sampling techniques whereby this study was taken under probability and non-probability sampling that involved the use simple randomly and quota sampling recommended by Phrasisombath (2009).

For easy analysis research data and interpretation of findings, this study adopted questionnaire as a data collection method which were prepared and then distributed to the sample size of 97 respondents. Megel & Heermann (2018) suggests that the use of questionnaire in research study helps a researcher have a quickly way of collecting and analyzing the research data.

To adapt the items related to the adoption of MOODLE students’ information system the researcher chose a UTAUT model which was used to guide this research study. Grant & Cynthia; Osanloo & Azadeh (2014) recommend for the use of theoretical framework to guide research study, therefore this study selected facilitating conditions from among the UTAUT constructs to assess its influence for the adoption of MOODLE system in higher learning institutions based on the variables used to measure.

The researcher performed different data analysis based on the data obtained from the respondents. Consequently, this study followed a recommendation given by Ibrahim (2013), who states that after collecting questionnaires from your respondents, a researcher is required to perform data cleaning and evaluation of the data collected. Therefore, this study used application software known as Statistical Package for Social Sciences (SPSS) v.16 to code the research data that enabled the researcher to conduct data analysis from which the descriptive statistics were produced to indicate mean, frequency and standard deviation for the research findings.

The analysis also involved the use correlation statistical model to determine the relationship that exists between variables; additionally, the Analysis of Variance (ANOVA) and Regression model were conducted for data analysis. According to Tan et al. (2008), this study used the significant value (P value) of the coefficient of regression and ANOVA that ranges at 0.000-0.05 to test the significant fit of the model. Multiple linear regression analysis was performed in this research study. Bremer (2012), explains that regression analysis provides description on how predictor variables X influence the dependent variable Y, likewise this study used research findings to describe the way facilitating conditions influence the adoption of students’ information system in higher learning institutions.

Furthermore, the researcher conducted validity and reliability test. This study performed validity test for the field data that provided a Bartlett's Test of 0.796 found to be greater than 0.5. Therefore this implies that the field data were accurate and valid according to the interpretation scale provided by Dansoh
et al. (2017). This study collected data by adopting items used by Venkatesh et al. (2012), who is accepted by scholar and number of research studies for example study conducted by Bervell & Umar (2017).

Additionally, the study specifically conducted reliability test for facilitating conditions construct to measure the internal consistency of the field data. The findings provided a Cronbach's Alpha 0.816 for facilitating conditions which is justified and scaled by Arfken & Balon (2011), who interpreted that research data have good internal consistency and therefore the data can be used for decision making.

This research study conducted hypothesis testing. Journal & Engineering (2015), suggest that a research study is required to perform hypothesis testing in order to determine a relationship that exists between predictor and dependent variables. Being the case, this research study conducted hypothesis testing to show the relationship between facilitating conditions and the adoption of students’ information system in higher learning institutions.

iv. Findings and Discussion

This research paper performs data analysis based on the data obtained from the sample of 97 respondents according to their gender, their level of study and area of study. This study targeted Certificate, Ordinary Diploma and Bachelor Degree students of the Institute of Accountancy Arusha as the major respondents who were supplied with study questionnaires and they were also given instructions on how to fill them correctly.

The study findings from table 1 below depicts that the majority of the respondents were male 62.9% and female were 37.1%. It is argued by Mutua (2015), that male are Information Technology (IT) dominant when the majority of respondents is male consequently brings technological imbalance between male and female.

<table>
<thead>
<tr>
<th>Table 1: Demographic variables for respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>Gender</td>
</tr>
<tr>
<td>Male</td>
</tr>
<tr>
<td>Female</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Level of Study</td>
</tr>
<tr>
<td>Certificate</td>
</tr>
<tr>
<td>Ordinary Diploma</td>
</tr>
<tr>
<td>Bachelor Degree</td>
</tr>
<tr>
<td>Total</td>
</tr>
<tr>
<td>Age group</td>
</tr>
<tr>
<td>14-17</td>
</tr>
<tr>
<td>18-21</td>
</tr>
<tr>
<td>22-25</td>
</tr>
<tr>
<td>26 and above</td>
</tr>
<tr>
<td>Total</td>
</tr>
</tbody>
</table>

Source: Field Data (2020)

On the other hand, the study findings from table 1 above indicate that 38.1% of respondents were Ordinary Diploma level of study in their majority, 36.1% were Bachelor Degree and 25.8% were Certificate level of study. These findings indicate that data were collected from respondents who are competent and knowledgeable.

Respondents were grouped according to their age group such that 14-17 in their minority were 3.1%, the majority of age group 18-21 were 51.5%, the age group 22-25 of the respondents were 40.2% and the respondents who were above 26 years were 5.2%. These findings indicate that the majority of the age group is 18-21 which implies that the data were collected from the respondents who are matured which result to increase in validity and reliability for the study.

Findings were drawn based on variables used to measure facilitating conditions, therefore a total of five variables were measured, indicated in table 2; assisting system difficulties, System compatibility, Knowledge for system utilization, required resources, and Technical support.

To assess facilitating conditions for the adoption of MOODLE based on five measurable variables, respondents were asked to rank them by putting a tick on the boxes provided depending on their level of preference by using a five Likert scale points from Strongly Disagree to Strongly Agree.
Study findings showed that the majority of the respondents disagreed or strongly disagreed that they real get specific person to assist them for the case of difficulties encountered. On the contrary, 42.3% of the respondents agree or strongly support that they get assistance from specific person to assist them for any problem faced as far as the system is concerned. This implies that students get assistance for the adoption of MOODLE system but not in their majority.

However, students also were asked to rank compatibility of MOODLE system against other systems they might have been using to facilitate their learning. Study findings in percentage indicate that the majority of the respondents 46.3% disagreed or strongly disagreed that MOODLE system is not compatible to any other systems used to facilitate their learning. On the other hand, 40.2% of the respondents disagreed or strongly disagreed on compatibility of MOODLE system against the other ones and 16.5% of respondents neither agreed nor disagreed.

<p>| Table 2: Descriptive results based on measured variables to assess Facilitating conditions |
|---|---|---|---|---|---|---|---|</p>
<table>
<thead>
<tr>
<th>Construct</th>
<th>Measured Variables</th>
<th>SD</th>
<th>D</th>
<th>NAD</th>
<th>A</th>
<th>SA</th>
<th>Mean</th>
<th>STD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Facilitating conditions</td>
<td>I get specific person that assists me with any MOODLE system difficulties</td>
<td>F</td>
<td>24</td>
<td>21</td>
<td>11</td>
<td>32</td>
<td>9</td>
<td>2.8</td>
</tr>
<tr>
<td></td>
<td>Compatibility of MOODLE Students’ information system is not the same with the other systems I use in my study activities</td>
<td>F</td>
<td>10</td>
<td>29</td>
<td>16</td>
<td>33</td>
<td>9</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>I have the knowledge in utilizing the MOODLE</td>
<td>F</td>
<td>17</td>
<td>17</td>
<td>22</td>
<td>31</td>
<td>10</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>I have the required resources in using MOODLE</td>
<td>F</td>
<td>14</td>
<td>27</td>
<td>14</td>
<td>24</td>
<td>17</td>
<td>3.0</td>
</tr>
<tr>
<td></td>
<td>I get all technical supports while I am outside the institute</td>
<td>F</td>
<td>12</td>
<td>21</td>
<td>15</td>
<td>26</td>
<td>23</td>
<td>3.3</td>
</tr>
</tbody>
</table>

Key: SD = strongly disagree, D = Disagree, NAD = Neither Agree nor Disagree, A = Agree, SA = Strongly Agree, M = Mean, STD = Standard Deviation

Source: Field data (2020)

Furthermore, this study sought to assess facilitating conditions by measuring the knowledge of respondents for the adoption of MOODLE system. The research findings revealed that the majority of respondents 42.3% agreed or strongly supported that they have knowledge that helps them to adopt the system. On the contrary, 35% of the respondents opposed or strongly opposed that they have knowledge that enables them to utilize the system to facilitate their learning while 22.7% of the respondents were neutral.
Research findings as depicted in table 2 indicate that 42.2% of the respondents in their majority supported or strongly supported that there are enough resources require facilitating the adoption of students' information system, the same percentage opposed the idea.

The adoption of MOODLE system needs to be facilitated with sustainable technical support. Therefore, the respondents were asked to rank the level of technical support while they are outside the campus and the research findings revealed that the majority of the respondents 50.5% agreed or strongly agreed that they are given technical support whenever they need while they are outside the institute. On the other hand, 34% of the respondents opposed the statement as they disagreed or strongly disagreed and 15.5% of the respondents were neutral.

Correlation Analysis

This research study performed correlation analysis to determine the influence of facilitating conditions to the adoption of students’ information system in higher learning institutions.

<table>
<thead>
<tr>
<th>Table 3: Correlation Analysis</th>
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<tbody>
<tr>
<td><strong>Facilitating Conditions</strong></td>
</tr>
<tr>
<td>Pearson Correlation</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td>N</td>
</tr>
</tbody>
</table>

**. Correlation is significant at the 0.01 level (2-tailed).

Source: Field Data (2020)

The researcher conducted correlation analysis to find out the existence of any relationship between facilitating conditions towards the adoption of students' information system in higher learning institutions and the level of significance between Table 3 indicates a Pearson correlation $r$ to be 0.397 which is interpreted by Wong & Hiew (2005) as a moderate relationship.

Regression Analysis

Analysis of Variance (ANOVA)

ANOVA was used to test the overall fit of the model whereby the test is said to be significant at $p$ value 0.000 – 0.05. The research findings indicate that the $p$ value in the regression coefficient and ANOVA ranges at 0.000 – 0.05 which indicates that the statistical independent and dependent variables. Schober & Schwarte (2018) supports the measure of correlation coefficient $r$ to determine the strength of facilitating conditions and the adoption of students’ information system in higher learning institutions. Between facilitating conditions and the adoption of students’ information system in higher learning institutions.

Model significantly fit at predicting the adoption of students’ information system in higher learning institutions.

With the hypothesis testing, the multiple linear regression model shows that facilitating conditions has no significant relationship with the adoption of students’ information system in higher learning institutions given that the significant value for facilitating...
conditions is 0.212 greater than 0.05 resulting to reject the alternative hypothesis. Furthermore, field data indicated that facilitating conditions has a regression coefficient of 0.086 which means that, a 100% increase in the extent of students to believe that the adoption of MOODLE system requires them to be facilitated by the measured items will increase the adoption of students’ information system in higher learning institutions by 8.6%. 

**DISCUSSION**

This research paper sought to assess facilitating conditions for the adoption of students’ information system in higher learning institutions. Study findings revealed that the majority of the respondents did not support on getting assistance when facing system difficulties that hinder the adoption as depicted in figure 1 that pictorially indicates the vast majority of the respondents who agreed or disagreed the given view. In relation to facilitating conditions Ivanović et al. (2013), found that MOODLE difficulties can be encountered by replacing the older version of the system with the latest one. Additionally, study conducted by Suppasetseree & Dennis (2010), suggests that MOODLE users are required to not afraid as they face any system difficulties, instead they can just contact with system specialists for some help or suggestions depending with what has happened. 

![Figure 1: Assistance with system difficulties](image)

**Source:** Field data (2020)

Generally, students’ information system is not compatible to the other learning systems. The majority of the respondents support that the compatibility of MOODLE system is quite different from other learning management system. This is in line with the findings drawn by AL-Huseiny (2015), who found that alternative Learning Management System other than MOODLE sometime face internet problem caused by poor infrastructures and different number of technical problems. LENGYEL et al. (2006), concludes that MOODLE system is suitable and the best if the higher learning institution have this system set up and run on their own platforms and servers. 

With regard to the knowledge of the respondents in using MOODLE, the majority of the respondents agreed that they have knowledge to use the system and the minority of the respondents did not support on having knowledge to use the system. A study made by Suppasetseree & Dennis (2010a), establish that the 96% of the respondents agreed that they have knowledge in using MOODLE system to facilitate their learning activities. Additionally, studies conducted on the areas of students’ system adoption for example Gunduz & Ozcan (2017), recommends that higher learning institutions should create awareness as well as conducting training for MOODLE users in order to impart enough knowledge for system utilization. 

Furthermore, this research study shows to have the same percentage of respondents in totality to agree and disagree that they have required resources that facilitate them to adopt MOODLE system as shown in figure 2.
The adoption of students' information system is influenced by specific resources that may be required to facilitate learning for students. Research study by Chokri (2012), concludes that ICT expertise to learners is one of the required resources as well as creating proper resources adopted by online facilitators. On the other hand a research study by Suppasetsee & Dennis (2010b), found that 97% of the respondents agreed that they have enough resources that facilitate them to adopt students' information system in their college. These findings imply that specific resources play a major role in influencing the adoption of MOODLE system in higher learning institutions.

This study also sought to assess facilitating conditions by ranking the level of technical support for students while they are outside the campus. The research findings disclosed that the significant majority of the respondents agreed on being facilitated and supported for any technical support that may be encountered. However, the research findings by AlQudah Ahmed (2014), concludes that technical support for facilitating the adoption of students' information system, creates positive influence for both perceived usefulness and perceived ease usage of students' information system, studies also recommends reliable internet access to students that supports every student in the institution of higher learning to perform learning activities in this online platform (Ziraba et al., 2020).

v. Conclusion

This study aimed to assess facilitating conditions influencing the adoption of students' information system in higher learning institutions. The findings for this study based on five measurable variables used to rank students' assistance with any system difficulties, system compatibility, and knowledge for system usage, required resources and technical support. Research findings revealed that the adoption of MOODLE system is influenced by facilitating conditions, whereby the respondents agreed that they get assistance in case of any system difficulties, on the other hand the respondents in their level of preference agreed that the compatibility of MOODLE system is not the same with the alternative systems used for learning purposes and therefore previous studies recommend replacing for the use of latest version of MOODLE system to meet compatibility issues, additionally, the findings disclosed that students have knowledge to use the system as a result of training offered by the institute, furthermore, the adoption of MOODLE system requires specific resources; study findings show that higher learning institutions need to invest on ICT expertise in influencing the adoption and also the study findings indicate that technical support for the adoption of MOODLE system was found to have positive influence for perceived usefulness and perceived ease of use.

The correlation analysis for this study indicates that the correlation coefficient for facilitating conditions is $r=0.397$ which indicates a moderate relationship between facilitating conditions and the adoption of students' information system in higher learning institutions.

vi. Recommendation

This research paper recommends the following:

- For successful adoption of MOODLE system, the institutes of higher learning should provide technical support through her competent and reliable IT personnel.
The institute should improve students' knowledge by offering regular training and continuous utilization of MOODLE system in their learning activities.

Recommendations for further studies can be carried out on similar study by increasing the number of sample and opting for other sampling techniques. Additionally, further studies can be taken for the variables found to be insignificant for example; this study found facilitating conditions to have insignificant relationship with the adoption of students' information system in higher learning institutions.

vi. References


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