The Impact of Task- Technology Fit At The University of Belize: A Comparative Study Between MOODLE and Other LMSs.

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Abstract

Learning management system (LMS), "is an online system or software which is used to plan, execute, and assess a specific learning process. In simple words, software used in eLearning programs and which helps in administration, documentation, tracking, and recording" (eLearning Industry, 2021). Many businesses/institutions invest in this type of management system to grow and become competitive; it helps them in day-to-day routine making it much easier for them in terms of planning and executing tasks. Many schools are now fully online, especially Universities and some secondary schools, even before the pandemic that we are currently facing, online platforms were already taking over and currently in the process of advancement. The University of Belize uses its platform to conduct online classes, give notes, and conduct tests, quizzes, and assignments on the Moodle platform. Within this research paper, it will be discussing and analyzing the effects of the task technology fit of a learning management system (LMS) for teachers at the University of Belize. Data will be collected with the use of google form and sent out to lectures at the University of Belize to gather data to determine the level effectiveness and efficiency of the Moodle platform and other Learning Management used by the University of Belize.

Keywords: Task-technology fit (TTF), Learning management system(s) (LMS), Modular Object- Oriented Dynamic Learning Environment (MOODLE), University of Belize (UB)

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1. Introduction

Importance of Research

The importance of this research is to conduct a study which can provide information about both Moodle and other LMSs in order to develop recommendations for the improvement of Moodle. Moodle is a very important tool in many institutions especially during troubling times like we are in with the covid-19 pandemic. This research will allow us to get feedback from users of the LMSs and find solutions on how to improve the information system for effectiveness and efficiency.

Originality

This research is being conducted by students of the Management Information System class at the University of Belize. This research topic was chosen due to the experiences students from the University have faced using Moodle and other LMSs. The results from this research will be presented to the University of Belize to provide them with essential information that they can use to improve their Moodle system. A survey data collection was done by Dr. Ryan in conjunction with the students conducting this research. The information being collected and shared from the research is credible therefore can be used for future research.

The Known and Unknown

The known information about the Moodle Learning management system is that the system is easier to use than other LMS's and the system can be personalized. For example, the university can set up their Moodle system to match their color theme, make changes, etc. The unknown is that the lecturers at the University use other back up LMS's other than Moodle such as Google Meets, Zoom and Google Classroom to share and collect information.

Objectives of Research

- To find the similarities between Moodle and other LMS's

- To determine the differences between Moodle and other LMS's
- To determine the impacts of Moodle and other LMS's
- To determine which would be more fit for the University of Belize

Goal of Research

- To determine the level effectiveness and efficiency of the Moodle Learning Management used by the University of Belize

2. Literature Review

In today's technologically advanced era, especially with the current pandemic occurring in the world, in order for an Educational Institution to "set-up" its students for success, it is vital that Information Technology be a part of the educational system. Management information system (MIS) is the study of people, technology and organization and the relationship among them (Laudon & Laundon, 2016). This research has considered a range of outcomes in a variety of online learning contexts. It focuses on the task technology fit of a learning management system (LMS) at the University of Belize and the data comparison was between MOODLE and other LMSs. The diversity of studies conducted based on e-learning shows that there is a wider context in which e-learning takes place in addition to LMS that are important factors in e-learning success.

Moodle is an open source, learning management system platform utilized at the University of Belize to deliver all University E-Learning courses at its greatest ability. It is the abbreviation for Modular Object-Oriented Dynamic Learning Environment (MOODLE). It is a platform created to provide lecturers and students with a secure and integrated system to create a personalized learning environment for its users. It provides learning through electronic technologies to access their educational curriculum outside of a traditional classroom. The system itself is hosted on the University of Belize's Campus and is coordinated by the Information Technology Department. It helps students and lecturers navigate through the course pages to be able to utilize the available tools on the platform to achieve success within each course. There are approximately 5,492 students currently enrolled at the University of Belize and are utilizing this system. The platform is accessible by any electronic device that has access to a browser or Moodle app; so then, students are able to use a cellphone, tablet, laptop, desktop or personal computer to access their classes and lectures on Moodle.

Learning management systems are software that are designed specifically to create, distribute and manage the delivery of educational contents. It can be hosted as a standalone product on a company's server or it can be a cloud-based platform that is hosted by the software firm (Valamis 2019). An example of

another LMS used at the University of Belize is Google classrooms, zoom platform and google meet platform. These other LMSs allow lecturers who do not fully understand or are unfamiliar with the Moodle platform the University uses, to conduct their lectures and assessments. According to Coates et al. (2005), LMS research is characterized by a diversity of studies conducted in a wide range of context on a variety of outcome variables using different explanatory models and variables. He advised that to gain further understanding of the factors that influence learning outcomes in a LMS environment, it is useful to conduct research within the context of modules that show predicting information systems success.

According to Piccoli, Ahmad, and Ives (2001) who did a similar research study, he found that e-learning students reported a higher computer self- efficacy and they were less satisfied with the learning process when comparing learning in an LMS environment to learning in a face-to-face context. Since the pandemic of the Coronavirus (COVID-19) took effect in Belize in March 2020, all face-to-face classes were stopped and all classes had to be transferred/offered online. A few classes were already offered online; however, UB had to work quickly and diligently with their staff to have all classes accessible online for each enrolled student.

At this time, MOODLE was not the only platform being used for online learning because many teachers and students were not quite familiar with it. So then, other online learning management systems were being utilized to carry out studies. It is explained that perceived acceptance of e-learning includes instructor's teaching style, instructors' attitude, technical competency, motivation, interaction, ease of access to the technology, reliability in infrastructure and the university support (Selim, 2007).

Hayashi, Chen, Ryan and Wu (2004) showed that perceived usefulness and satisfaction is directly influenced by the continuance of use in a LMS context. It was explained that both usefulness and satisfaction were positively associated with the confirmation of the expectations of the system. Their research also suggests that service quality, system quality, perceived ease of use and cognitive absorption influenced satisfaction. In any case, not all students appear to respond positively to online and collaborative learning. However, after a debate between ODL and other departments/faculties within the University, ODL won the debate of mandating the use of Moodle platform at the University of Belize as this allows the University to achieve its superior margins.

A questionnaire was conducted on fifty- two (52) teachers at the University of Belize to analyze and understand their attitude and preference of the task technology fit of a learning management system (LMS) at the University. The data comparison was between MOODLE and other learning management systems (LMSs). The data collected is presented in the Data Analysis and Discussion section with histograms showing the results.

Research question

This paper considers the role of task-technology fit in learning management systems (LMS) and its preference and success for the teachers at the University of Belize. It uses histograms to illustrate the question of how task-technology fit influences the performance impacts of LMSs. The primary research question investigated in this study is,

- How does task-technology fit influence the performance impacts of learning management systems (LMS) for teachers?

Limitations

The study was conducted to gather data on teachers at the University of Belize to analyze and understand their attitude and preference of the task technology fit of a learning management system (LMS) at the University. Responses were taken from teachers who participated in the questionnaire via Google forms. However, the group did not gather the data first hand from the teachers because the data was collected by the lecturer of the class who distributed the questionnaire via email to each teacher.

So then, a limitation was that the group members did not partake in the questionnaire instrument. Furthermore, the lecturer explained that a few of the teachers did not respond and he would have made a follow up but he sent us what he had collected to proceed. To add, the time allotted to conduct the research was very limited since the lecturer did not receive all responses; however, the group worked with the data that was collected. Nevertheless, to have gained the experience and knowledge of gathering data for a questionnaire, the lecturer had each member of the group collect 10 questionnaire responses from students of UB.

3. Methodology

The hypothesis was tested in this study.

H1: Task−technology fit will positively influence expected consequences of LMS use

Nonetheless, in their 2004 trial of the TPC, Staples and Seddon (2004) tried the connection between task−innovation fit and mentality towards use. They found that task−innovation fit didn't essentially affect mentality towards use when use was discretionary; just when use was compulsory. With LMSs getting logically encircled in educating and learning, the utilization by understudy is tending to get compulsory. Along these lines the accompanying theory was proposed

H2: Task−technology fit will positively influence attitude towards LMS use

Triandis (1971) spread the word about the job of unsurprising meanings of utilization in affecting conduct. While Goodhue and partners didn't test this relationship (Goodhue et al., 1997; Goodhue and

Thompson, 1995), Thompson, Higgins, and Howell (1991) tracked down that normal meanings of utilization heartily affect application and Staples and Seddon (2004) discovered an importance when use was deliberate. It was in this manner speculated that

H3: Expected consequences of LMS use will positively influence LMS utilization

In the TPC, approach towards utilization of the framework is recommended as an indicator of use (Goodhue and Thompson, 1995). Earlier examination on this relationship has been different. While Chang and Cheung (2001) build up that mentality to utilize emotional goal to utilize the WWW at work, Staples and Seddon (2004) didn't find a relationship in both of the two territories they examined: Despite this vulnerability about the job of demeanor, consistent with Goodhue and Thompson's presence of the way in the TPC it was conjectured that

H4: Attitude towards LMS use will influence LMS utilization

The job of social guidelines has been investigated and brought about blended outcomes when it came to data frameworks achievement. A few creators have set up that it impacts usage (Venkatesh and Davis, 2000). Venkatesh and Davis (2000) asserted that the impact of social principles is limited to required conditions and, predictable with this, Staples and Seddon (2004) tracked down that social norms didn't affect use when utilization was willful but instead just when it was obligatory. There has been minor investigation of the part of social norms in e-adapting however given the ambiguity of the job of social guidelines in the achievement of frameworks by and large, it was thought that it was essential to research it in this examination. In this way the accompanying theory was proposed

H5: Social standards will positively influence LMS utilization

The utilization and execution can be impacted by various conditions identified with help for the framework. A beneficial outcome was found in Chang and Cheung's (2001) study while Staples and Seddon (2004) didn't find that working with conditions affected use. Working with conditions had a solid roundabout impact on mentality toward use was found by Ngai, Poon, and Chan's (2007) investigation of LMS reception. Steady with the TPC it was thusly estimated that

H6: Facilitating conditions will positively influence LMS utilization

An examination by McGill and Klobas (2008) which straightforwardly tried the connection between recognized individual impact of client created accounting pages and experimentally estimated choice execution. They found that there was not a critical connection between singular effect and saw singular effect, despite the fact that client satisfaction had a huge beneficial outcome on both.

4.1. Participants

Moodle has been one of the most commonly used types of LMS at the University of Belize and was the LMS considered in this study. The participants in this study consisted of lecturers from the University of Belize who were using Moodle and other LMS in teaching their courses.

4.2. Procedure

The study was conducted around the mid of the semester. Lecturers of different levels of degrees were targeted to give a comprehensive range of both levels of use and teachings. Participants were contacted via email and a google document was created and the link was shared to complete a questionnaire on the web. It took around 15 minutes for the questionnaire to be completed. Completing the questionnaire was not mandatory but rather voluntarily and all replies were anonymous.

4.3. Measurement

Things to gauge the builds of interest were produced for the LMS space utilizing instruments from past research on the TPC as a beginning stage (for example Goodhue and Thompson, 1995; Hartwick and Barki, 1994; Staples and Seddon, 2004), with new things being created on a case-by-case basis. The poll was pilot tried (alongside the online finishing measure) by nine understudies and slight changes made to explain questions. The poll comprised two fundamental areas. The main area posed inquiries about the members and their past preparing and involvement in PCs, the Internet and WebCT. Given that few connections in the TPC have all the earmarks of being affected by the degree to which framework use is obligatory (Staples and Seddon, 2004; Venkatesh and Davis, 2000), members were additionally approached to give their impression of the level of compulsory nature of their utilization of WebCT by demonstrating their concurrence with the assertion 'I'm needed to utilize WebCT for my investigations' on 7-point Likert scale marked from 'firmly dissent' to 'unequivocally concur'.
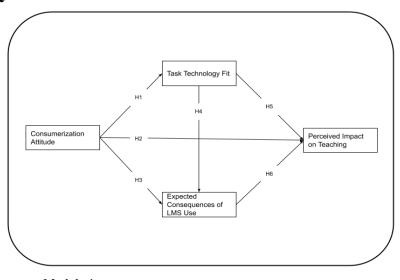
The second segment of the survey posed inquiries about the members' view of WebCT and its job in their scholastic achievement. The develops estimated in the subsequent segment are depicted beneath and the things used to quantify the builds are recorded in the Appendix. Assignment innovation fit was estimated with a complex measure. The parts of assignment innovation fit considered (and the wellspring of things used to quantify them) were work similarity (two things from Moore and Benbasat (1991)), convenience (three things from Doll and Torkzadeh (1988)), simplicity of learning (three things from Staples and Seddon (2004)), and data quality (5 things from Doll and Torkzadeh (1988)). The 13 things were estimated a 7-point Likert scale marked either from 'firmly deviate' to 'unequivocally concur' or from 'never' to 'consistently'. 500 T.J. McGill, J.E. Klobas/Computers and Education 52 (2009) 496–508 Attitude toward LMS use was estimated utilizing four things.

The things depend on things utilized by Hartwick and Barki (1994), Taylor and Todd (1995) and Davis et al. (1989) and utilize 5-point semantic differential scales. Expected results of LMS use was estimated utilizing eight of the 10 things utilized by Staples and Seddon (2004). These things were grown

at first by Davis (1989) and Moore and Benbasat (1991). The things were estimated on a 7-point Likert scale named from 'emphatically deviate' to 'firmly concur'. Accepted practices were estimated utilizing four things adjusted to the LMS setting from Hartwick and Barki (1994). The things were estimated on a 7-point Likert scale marked from 'firmly dissent' to 'unequivocally concur'. See Section 4.4.1 for a further conversation of this development. Working with conditions was estimated utilizing five things.

The things depend on things utilized by Baroudi and Orlikowski (1988), Thompson, Higgins, and Howell (1994) and Taylor and Todd (1995). The things were estimated on a 7-point Likert scale marked from 'unequivocally deviate' to 'firmly concur'. LMS usage was estimated utilizing four things. Members were asked how long seven days they utilized WebCT, and how long each week they planned to utilize WebCT over the remainder of the semester. Members were additionally approached to show their utilization and expected utilization of WebCT on a 5-point scale going from (1) 'light' to (7) 'substantial'.

LMS execution impacts were estimated twoly. Understudy view of the effect of WebCT on their learning overall were estimated utilizing three things dependent on those created by Goodhue and Thompson (1995). The things were estimated on a 7-point Likert scale named from 'firmly dissent' to 'emphatically concur'. This part of execution sway was portrayed as seen sway on learning. As suggested by Staples and Seddon (2004) and van Raaij and Schepers (2008) a target proportion of execution sway was additionally looked for. This was acquired by asking members which rate they had gotten for their last test, test or task. This part of execution sway was portrayed as understudy grades.

4. Data Analysis and Discussion

Module 1

H1: Consumerization attitude will negatively influence perceived task-technology fit.
H2: Consumerization attitude will positively influence perceived impact on teaching.

H3: Consumerization attitude will negatively influence expected consequences of LMS use.

H4: Task–technology fit will have a positive influence on expected consequences of organizational LMS use.

H5: Task–technology fit will have a positive influence on perceived impact on teaching.

H6: Expected consequences of LMS use will positively influence perceived impact on teaching.

At this point in the paper, we will be moving away from Academic Research to Applied Research. The results will be presented with the use of histograms.

This study was conducted on the teachers at the University of Belize. The teachers were given a questionnaire which measured 4 key elements in determining if consumerization attitudes impact the task technology fit of a learning management system (LMS). The 4 elements we analyzed are: Task Technology Fit of Moodle (TTF), The Consequences relating to the use of the LMS, The Perceived Impact that the system has on learning at the University and Consumerization . Module 1 shows the relationship between the 4 categories studied and how they may influence the other.

From the surveys sent out, a total of 52 teachers responded to the questionnaire. 53 % of the respondents were females.

Gender	Count
Female	28
Male	24
Grand Total	**52**

Figure: 1

The respondents' range between the ages of 20 – 60 with only 1 being over the age of 60. 40% of the respondents are over the age of 40. We typically consider these people to not be technologically savvy. This can influence the respondents' feelings toward the LMS.

Age	Count
20-30	6
31-40	14
41-50	21
51-60	10
>60	1
Grand Total	**52**

Figure: 2

These teachers' educational background ranges from the Bachelor's level to PhD. Thirty-eight (38) or 73% of the fifty-two (52) teachers have their Master's Degree.

Education	Count

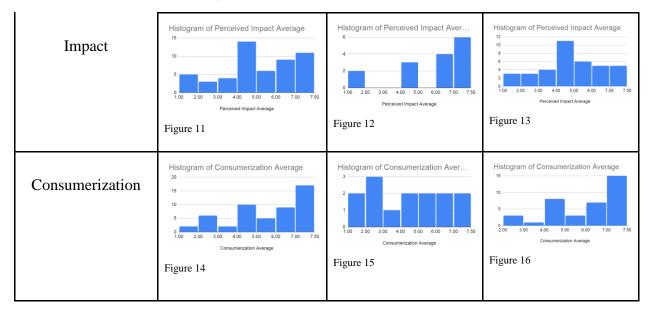| Bachelor's	4
Masters	38
PhD	10
Grand Total	**52**

Figure: 3

The respondents were a mixture of the various departments at the University. Most of the teachers were from the Faculty of Management and Social Sciences followed by the Faculty of Science and Technology.

Faculty	Count
FEA	7
FHS	5
FMSS	21
FST	18
ODL	1
Grand Total	**52**

Figure: 4

	All Response	Moodle Only	Moodle +
TTF	Figure 5	Figure 6	Figure 7
Consequences	Figure 8	Figure 9	Figure 10

Impact	Histogram of Perceived Impact Average Figure 11	Histogram of Perceived Impact Aver… Figure 12	Histogram of Perceived Impact Average Figure 13
Consumerization	Histogram of Consumerization Average Figure 14	Histogram of Consumerization Aver… Figure 15	Histogram of Consumerization Average Figure 16

Figures 5, 8, 11 and 14 show a variance in the charts. This is because the table includes teachers who use only Moodle and those that have used another LMS. The varying perceptions make it difficult to analyze the effectiveness of the LMS. In order to get a true understanding of impact and consequences on learning with the use of the LMS (Moodle), we need to analyze it from the perspective of those who have only used Moodle and those who have experience with other LMS.

TTF: When analyzing the TTF of teachers who only use Moodle, the chart leans more to the right because most of these teachers are satisfied with Moodle.

However, when comparing Moodle to other LMS, the results tend to be more neutral because these teachers are able to work with the system, they don't believe Moodle is the best.

Consequences: Teachers who only use Moodle believe that it will make it easier to deliver content to students online. We see this chart moving to the right which shows they can easily deliver the content using Moodle.

Teachers who have used other LMS on the other hand, are more neutral and do not believe Moodle makes it easier to teach online. These teachers find that they are not as effective using Moodle as they would be using Google Classroom for instance. The information is still transmitted to the students but these teachers believe that another LMS would make the information easier to grasp.

Impact: Figure 12 shows that teachers who have only used Moodle find that it is very valuable and it positively impacts their ability to teach online.

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While teachers who have used other LMS believe they are still effective, the majority of the respondents are more neutral in determining the effectiveness of Moodle. These teachers believe they are more effective using other LMS or maybe even a mixture of systems combined. These other systems or maybe even accessing more features of Moodle would then allow the system to be more effective.

Consumerization: Some teachers who have used only Moodle would be open to choosing another LMS to carry out their online session. However, the chart is higher to the left meaning that the majority of teachers who have only used Moodle are quite comfortable with the system and would not prefer to use another LMS. They believe Moodle is good.

Teachers who have used other LMS prefer these systems to Moodle. The chart leads to the right because these teachers would prefer to choose their own LMS. They do not believe Moodle is the best system to deliver content online.

Teachers who have no experience with other LMS believe that Moodle is adequate to get the job done. Since they have nothing to compare Moodle with, they have learnt the system and believe it works fine. These teachers may not be very technologically savvy and may have difficulty adapting to a new system. Teachers who have used other LMS however, do not believe Moodle is adequate enough to deliver the online content. While they are able to use the system to get everything done, their experiences with other systems makes Moodle seem inferior. They have already found a system they like that can accommodate the way they intend to deliver course content so because Moodle does not work in the same manner as the other LMS they don't find it to be very effective. Thus, the results show that consumerization attitudes do indeed impact the task technology fit of a learning management system.

Some recommendations to ensure that the LMS used by the University of Belize is truly effective and the university meets its strategic objectives of providing operational excellence, having a competitive advantage over other universities and even surviving during this trying time would be as follows:

- The university should allow teachers to choose which Learning Management System they want to use or allow for the use of a mixture of systems. This will also have students exposed to various methods of learning via an online platform.
- The university can also access other features of Moodle that are currently not available at the University of Belize. For Instance, the blackboard feature, this may allow lecturers to better use the system and may lead to them being more effective at delivering the content. Accessing these additional features would eliminate the need or want of another LMS.

5. Conclusion

In conclusion, after much discussion about how each teacher feels about the use of Moodle and other LMS, from the analysis it shows satisfaction from teachers that have only used Moodle as a source of conducting lectures. While others feel a sense that by the use of other LMS it would help or helps in conducting lectures more effectively and efficiently. These findings were gathered by the use of surveys through google form. A total of 52 teachers responded to our survey giving us knowledge of their view of Moodle that the University uses and the other LMS that they use to perform their lectures. Histograms were used to showcase these results and further analysis was done to elaborate on the findings. Some lecturers agree that using moodle is better as that was the one they were introduced to while others are more involved in using other LMS.

Limitations that were encountered while doing this research was that we didn't get first hand in collecting the data, furthermore, some lectures didn't respond to the survey and with their input it would have given us a broader view of the Moodle and other LMS. For future research my recommendation may include to be more prepared and increase the number of participants so that the data collected is accurate.

References

eLearning Industry. (2021). *Discovering Learning Management Systems: Basic Functions And   Benefits* . Retrieved from elearningindustry.com:https://elearningindustry.com/discovering-learning-management-systems-basic-functions-benefits

Coates, H., James, R., & Baldwin, G. (2005). *A critical examination of the effects of learning management systems on university teaching and learning*. Tertiary Education and Management, 11(19–36).

Hayashi, A., Chen, C., Ryan, T., & Wu, J. (2004). *The role of social presence and moderating role of computer self efficacy in predicting the continuance usage of e-learning systems. Journal of Information Systems Education,* 15(2), 139–154.

Laudon & Laudon. (2016). Mays Business School. Department of Information and Operations Management. *What is MIS? Management Information Systems*. Retrieved from What is MIS? | Management Information Systems | Department of Information and Operations Management (tamu.edu)

McGill, T., Klobas, J. (2000). *A task-technology fit view of learning management system impact*. Computers & Education.

Piccoli, G., Ahmad, R., & Ives, B. (2001). Web-based virtual learning environments: *A research framework and a preliminary assessment of effectiveness in basic IT skills training*. MIS Quarterly, 25(4), 401–427.

Selim, H. M. (2007). *Critical success factors for e-learning acceptance*: Confirmatory factor models. Computers & Education, 49(2), 396–413.

University of Belize. Retrieved from https://www.ub.edu.bz/

Valamis. (2019). The Forerunner of Digital Learning. *What is an LMS?* Retrieved from What is a Learning Management System | LMS Overview (valamis.com)