A Task–technology Fit View of Learning Management System Impact on UB Students

Cindy Rowland
University of Belize
University Drive, Belize City
200025011@ub.edu.bz

Shamae Somerville
University of Belize
University Drive, Belize City
2005112898@ub.edu.bz

Sheffield Brown Jr.
University of Belize
University Drive, Belize City
2018117763@ub.edu.bz

George Ezewudo
University of Belize
University Drive, Belize City
2018219535@ub.edu.bz

Nyesha Hyde
University of Belize
University Drive, Belize City
2017116868@ub.edu.bz

Abstract

In higher education, many teachers and students use learning management systems (LMSs) which is a platform for e-learning. In any case, a lot of the research on LMSs has had an innovation center or has been restricted to ponders of appropriation. Therefore, research is needed which looks at the roles of LMSs. One of the factors that has appeared to impact both the utilization of information systems and their execution impacts is task-technology fit. In this paper, the study described the utilization of technology-to-performance chain as a system to address the questions of how task–technology fit impacts the performance impacts of LMSs. The results of this study will show the significance of task-technology fit in e-learning. However, while it showed that it had a great effect on what is believed of LMS, when it comes to the students' grades it was poor. Opposite to desires, encouraging conditions and common social standards did not play a part within the execution impacts of LMSs. Be that as it may, educators' standards had a critical impact on seen effect on learning by means of LMS usage.

Keywords: Interactive learning environments, Learning management systems, Task–technology fit, Technology-to-performance chain, E-learning, Moodle

Introduction

The education system is no longer limited to in class learning and for students growing up in the education system until they have achieved the highest learning. Students re-engage in education after being out for a long period of time, and they also have the options of choosing whichever school they wish to study without having to be there physically. E-Learning has been on the rise in recent years, and it's

really not hard to see why. On one hand, eLearning courses have become hugely popular by the simple virtue of being so much more convenient than traditional face to face courses (Dexway, 2017). The continuous improvement in technology allows students to engage in online classes from any corner of the globe and at whatever time is convenient to them. Not many people have the ability to take time off from work to commit to a full-time graduate program, and others often travel for work (Miller, 2019). For those who still need to juggle working and going back to school, the flexibility of an online program provides individuals with the opportunity to learn while still working and growing professionally. One of the most effective online platforms is the Learning Management System (LMS). A learning management system is an online education hub that provides a large and indispensable set of features to support educational activities such as classroom learning, distance education and continuing education. This system makes it easy for teachers to create educational contents and to organize the learning material for students (Neo, 2017).

This research will engage specifically the students of the University of Belize and their experience with Moodle which is the school's most used learning management system. Moodle, a simple interface, drag-and-drop features, and well-documented resources along with ongoing usability improvements make Moodle easy to learn and use (Moodle, 2020). It has been proven to be very effective in the monitoring and engagement of students and employees in different organizations, however, the researchers seek to determine the effectiveness of the online system at their university. The researchers also seek to understand the importance of an effective learning management system, to discover the benefit of using Moodle to engage and monitor students in an online education program, and to determine the preference of students in using a learning management system versus face to face teaching. Online learning leads many students to opt for online platforms when they want to earn a degree or certificate (Norman, 2016). The ultimate goal of the research is to prove that Moodle assists in making online education a better learning experience for the students of the University of Belize.

Literature Review

Task–technology fit

There are many models that are used to let organizations be aware of how to use Information Technology more efficiently. Goodhue and Thompson developed one such model called the technology-to-performance chain, however, there are several different task-technology fit models. The task-technology fit (TFF) theory states that "IT is more likely to have a positive impact on individual performance and be used if the capabilities of the IT match the tasks that the user must perform" (Goodhue and Thompson, 1995). They found that TFF measured not only utilization but it also predicted that based on results there is significant job performance improvement and effectiveness of system usage.

Goodhue and Thompson talk about two major models used to evaluate the link between technology and performance. The first is utilization which focuses on the user's behaviors, attitudes and beliefs. The model shows that if there is increased usage of technology, then there will be positive performance impact. The next model is task-technology fit (TFF). This model indicates that there will be an increase in users' performance if the technology used provides support and features that fit the jobs (Goodhue and Thompson, 1995).

According to McGill and Klobas, they used TTF to evaluate the performance impacts of a web-based course management system (WebCT) that is related to the supportive learning processes, such as managing, delivering, and tracking online learning. Their results showed that the TTF of the WebCT had a strong and positive effect on perceived learning performance both directly and indirectly through the level of utilization. This study which was highly cited, demonstrates how TTF is a factor that influences both the use of information systems and their performance impacts (McGill and Klobas, 2009). There was another exploratory study done by D'ambra which looks at investigating how academics perceive the fit of functionality of e-books towards tasks like teaching and learning. His study found that TFF of eBooks indeed had a positive effect on instructors' job performance in relation to the tasks and the use of

technology. The study also confirmed that there is a significant positive impact that TFF has on users' performance and use of the technology (D'ambra, 2013).

There are certain limitations of using these models. The utilization model does not take into account that the utilization may be voluntary. Due to this, the performance will of course depend on the task-technology fit and not utilization (Goodhue & Thompson, 1995). For this reason, they have proposed the technology-to-performance chain (TPC) model which recognizes that technology must be utilized at the same time fitting the task it supports in order for them to have a performance impact and success. The model that was used in this research is that of Goodhue and Thompson (1995) which has 8 factors. The technology-to-performance chain (TPC) model in Figure 1 shown below is the model that was used in this research. It was altered to reflect the change of the result. This model is the final structural model which is divided into different variance. It gives a clearer and accurate visual representation of the way technology and utilization is related and how they relate to task performance (Goodhue and Thompson, 1995).

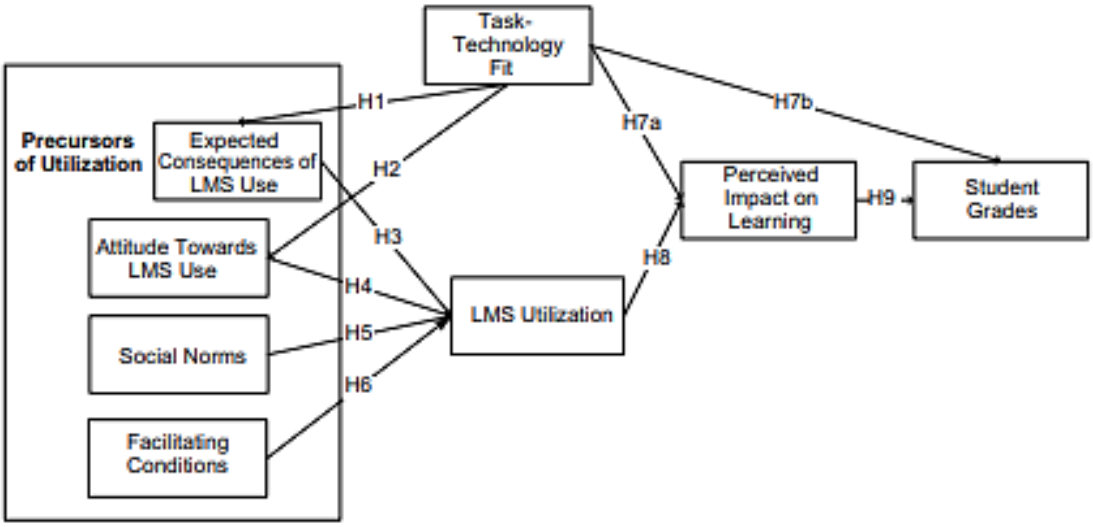


Figure 1. Initial Model

Methodology

Research Questions

This research paper looks at the role of how task-technology fits in LMS.

Participants

The goal of this research is to evaluate a task–technology fit view of learning management system impact at the University of Belize. To do so, data was collected through questionnaires. The questionnaires were distributed via email and WhatsApp to University of Belize Students who use the University's learning management system. The research was carried out using the title Management Information Research and had two objectives; (1) to gather empirical evidence of students' perceptions of Moodle and (2) To fulfill the University's mission by publishing academic research papers. This research involved the use of Google Forms to distribute the survey. The google form was constructed using the Likert Scale which allowed participants to choose between a range of 1 to 7 with 1 being strongly disagree and 7 being strongly agree. By using google forms questionnaire, the researchers can anonymously analyze the participant's answers in which the results will reflect the outcome of the research.

Procedure

The study was conducted mid semester. The respondents of this survey were students enrolled at the University of Belize for the 2020/2021 semester who were randomly asked to give a wide range of responses about the topic across the entire University of Belize Student' population.

The University of Belize was chosen as the focus of this study because it has the largest population of students in the country of Belize. Participants were initially contacted via email and WhatsApp and were invited to participate in the study by clicking on a link to complete a questionnaire on the web. The questionnaire took approximately 12 minutes to complete. Completion of the questionnaire was voluntary and all responses are anonymous.

Measurement

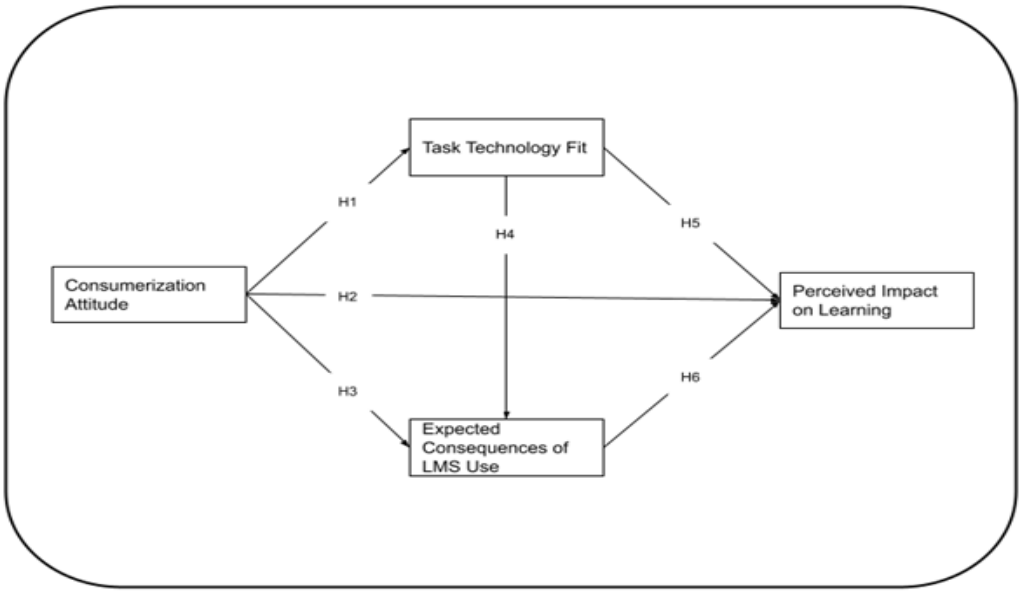


Figure 2. Simplified TTF Model

H1: Consumerization attitude will negatively influence perceived task-technology fit.

H2: Consumerization attitude will negatively influence perceived impact on learning.

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 learning.

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

This survey was created to determine A task–technology fit view of learning management system impact on students taking online classes. Items to measure the learning management system impact at

the University of Belize were developed using the task technology fit of a learning management system. What Influences Technological Individualization? An Analysis of Antecedents to IT Consumerization Behavior and Roles of perceived fit and perceived individual learning support in students' weblogs continuance usage intention, with new items being developed as needed (Ifinedo, P. 2018, July 15).

The questionnaire consisted of seven main sections. The questionnaire had seven sections which were broken into 50 questions. Section 1 of the survey included the participants' personal information which included but not limited to age and gender. Section two was based on learning preferences. Section three was based on Prior Moodle Use. Section four was about Task-Technology Fit and online teaching. In section five participants were asked questions based on expected consequences of the learning management systems used. Section six was on perceived impact on learning and the final section, 7 was consumerization attitude, perceived fit/Expected Performance.

The task Technology fit construct measures the compatibility of the learning management system (Moodle) with the students' perception of the system. Moodle fits well with the way I like to study online. Moodle is compatible with all aspects of my online study. It is easy to use and user friendly and easy to learn.

An LMS can support or hinder active engagement, meaningful connections between segments of the course, easy communication, and formative feedback by making it easier or more difficult for faculty to communicate course requirements, provide open-ended feedback, and place course elements that are used together contiguous to one another (Research Gate, January 2010)

The expected consequences of Moodle were assessed by stating whether or not the learning management system would help students to accomplish their studies early. If it would improve their performance in units. Will it increase productivity or enhance effectiveness in their program of study? Expected consequences of LMS were measured on a 7 point Likert scale labeled from 'strongly disagree' to 'strongly agree'.

The availability of course materials that LMS provides positively impacts the ability for students to learn in and outside of the classroom. The learning skills of students has improved in courses where LMS are available (Donghyun Kim).

Information and communication technologies (ICT) in general, and collaborative technologies in particular, are useful resources for improving teaching and learning in the higher education sector (Ifinedo, 2007). If my teacher could choose their own Learning Managements System, it would fit well with learning online, it would fit well with helping me to be efficient in learning online and it would be compatible with my online learning.

Consumerization Attitude - Expected Performance improvement was measured using three items: Participants were asked if my teacher could choose their own Learning Managements System: with possible answers of; my online learning performance would improve, my online learning productivity would improve and I would work faster while learning online.

Data Analysis and Discussion

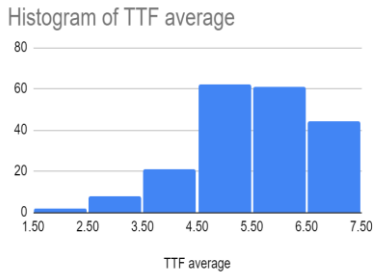
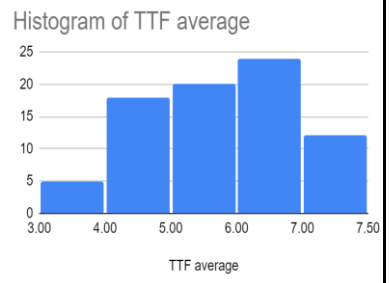
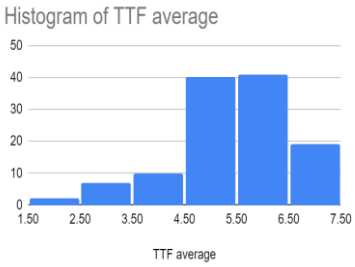
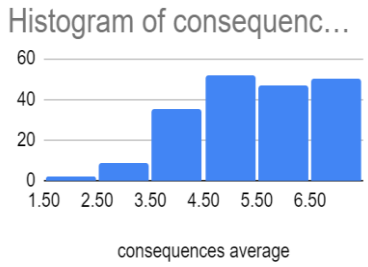
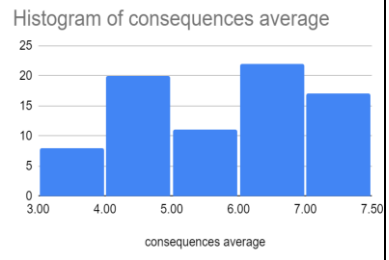
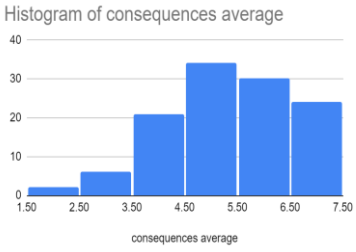
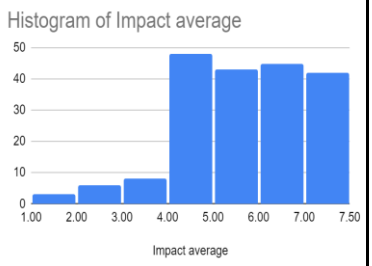
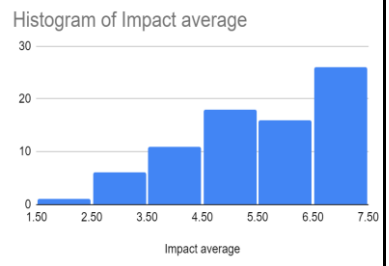
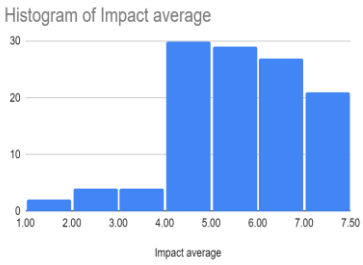
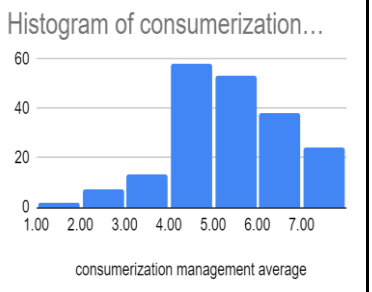
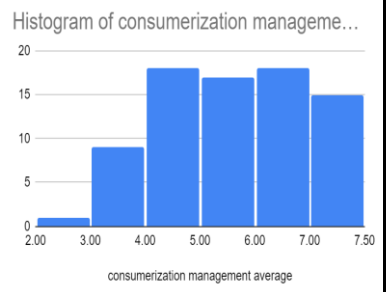
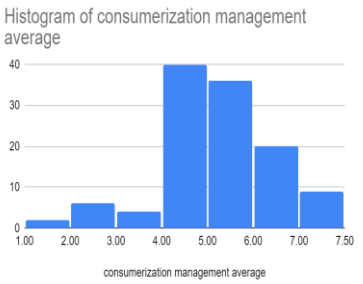
	All Responses	Moodle Only (NO)	Moodle +(YES)
TTF			
Consequence			
Impact			
Consumerization			

Table 1. Histograms with results from survey

The first three chapters were set up as basic research (academic research) However, this chapter moving forward we will change to applied research because we don't have time to test the hypothesis, so we will change to applied research. The model helps solve the problem of task technology fit within the University of Belize because it enlightens the organization with the information needed to achieve maximum success in order to grow and raise the bar for equilibrium in the market with its higher quality education to be offered.

TTF

Moodle fits well with the way I like to study online.	Moodle is compatible with all aspects of my online study.	Moodle is easy to use.	Moodle is user friendly.	It is easy to get Moodle to do what I want it to do.	Moodle is easy to learn.	It is easy for me to become more skillful at using Moodle.	New features of Moodle are easy to learn.	Do you think the output from Moodle is presented in a useful format?	Is the information from Moodle accurate?	Does Moodle provide you with up-to-date information?	Do you get the information you need in time?	Does Moodle provide output that seems to be just about exactly what you need?

Table 2. TTF Responses

As indicated in the histogram above (all responses of Task technology fit) we can see that the favorability of Moodle by University of Belize students depicts a left skewed representation of the statistical data that was collected. This skewness indicates that about 75 percent of the entire 199 students of the sample population like and are willing to work with Moodle efficiently and effectively to pursue their college education.

From the 80 no responses who took one or more online classes prior to the pandemic, we can see that the histogram indicates a centered satisfaction of the Moodle platform within their time of usage so they would likely feel as if the usability, compatibility is fairly okay to work with.

In addition, from the 119 yes responses that took one or more online classes prior to the pandemic, the questionnaire the chart depicts more robust data leaned towards higher satisfaction of Moodle accuracy, timely updates, having what is being needed to learn effectively, its user friendliness and great format.

Consequence

Using Moodle for online classes will help me to accomplish my study more quickly.	Using Moodle for online classes will improve my performance in units.	Using Moodle for online classes will increase my productivity.	Using Moodle for online classes will enhance my effectiveness in my program of study.	Using Moodle for online classes will make it easier to complete my learning tasks.	Using Moodle for online classes will give me greater control over my learning tasks.	Overall, I think that Moodle will be useful in my online studies.	Using Moodle will improve the quality of my online learning.

Table 3. Consequence Responses

As it relates to the consequence of the Moodle platform, the findings from the sample population (199) of the UB students leaned towards the platform being highly successful. What is being seen in the extraction of the data is that Moodle supports easy studying, better performance in various unit in different topics, provides easy studying and learning online environment, which outputs and higher quality of education in online learning.

Impact

Moodle has a large positive impact on my effectiveness and productivity as a student in online classes.	Moodle is an important and valuable aid to me in my online studies.	I learn better online with Moodle than without it.

Table 4. Impact Responses

Task technology fit is very important to ensure that the organization carries out its function efficiently and effectively and it is no different for the University of Belize, based on the clients(Student) feedback on the impact of the Moodle platform as it relates to the impact of on effectiveness and productivity in an online class environment while also being important and providing valuable aid to support online learning we can see that all three graphs are left skewed. This date indicates that there is maximum satisfaction as it relates to the impact which Moodle has on the students learning outcome.

Consumerization

If my teacher could choose their own Learning Managements System it would fit well with learning online.	If my teacher could choose their own Learning Managements System it would fit well with helping me to be efficient in learning online.	If my teacher could choose their own Learning Managements System it would be compatible with my online learning.	If my teacher could choose their own Learning Managements System my online learning performance would improve.	If my teacher could choose their own Learning Managements System my online learning productivity would improve.	If my teacher could choose their own Learning Managements System I would work faster while learning online.

Table 5. Consumerism Responses

The consumerization of the Moodle platform also shows a left skewed interpretation of data shows that the students. this indicates that the satisfaction of the Moodle platform is common among students. This portion of the questionnaire targets the idea of the implementation of an alternative learning management system and based on the results the students still believe Moodle is better than a custom system by their respective lecture. This data could be backed up by being able to have one universal platform or all subjects as oppose to learning to use a new platform for each respective teacher's subject

The consistency of the data shows that Moodle is indeed a great task technology fit platform in order to ensure that the University of Belize carries out its mission and vision. The analyzation of the data also shows that although the university need some improvements in its Moodle platform although it's great because the result does indicate 100% satisfaction by its users.

Conclusion

Results from this study show different patterns in opinions about technology in learning. Results from this study indicate that students are favorable in using Moodle as an effective method of learning. Findings also show that the platform is successful in being user friendly and makes for higher quality education. There is maximum satisfaction as it relates to the impact, effectiveness, and satisfaction by Moodle's users in the sample taken. Final statements drawn from this research were possible due to the graphs and tables formed from the results of the survey of 199 students. Implications to this research shows that the university should continue to utilize Moodle as the main form of online learning. The main

shortcomings of this research is response time of participants being a long wait. It is recommended for further study on the Moodle platform that the sample size be larger and quantitative methods be included in the methodology.

References

Dexway. (2017, July 17). *5 Reasons Why Online Learning is More Effective - Dexway*. Dexway. https://www.dexway.com/5-reasons-why-online-learning-is-more-effective

Donghyun Kim. (2017). *The impact of learning management systems on academic performance: Virtual Competency and student Involvement*. Journal of Higher Education Theory and Practice Vol. 17(2) 2017 http://www.na-businesspress.com/JHETP/KimD_Web17_2_.pdf

Goodhue, D.L. (1995). Understanding User Evaluations of Information Systems. Management Science, 4112, 1827-1844. https://pubsonline.informs.org/doi/abs/10.1287/mnsc.41.12.1827

Goodhue, D.L., Thompson, R.L. (1995), *Task-Technology Fit and Individual Performance, MIS Quarterly* 19.2, 213-236.

Ifinedo, P. (2018, July 15) *Roles of perceived fit and perceived individual learning support in students' weblogs continuance usage intention* https://doi.org/10.1186/s41239-018-0092-3

J. D'ambra, C.S. Wilson, S. Akter. (2013). A*pplication of the task-technology fit model to structure and evaluate the adoption of E-books by Academics*. J. Am. Soc. Inf. Sci. Technol., 64 (1) (2013), pp. 48-64

K. Ortbach, M. Bode, B. Niehaves. (2013). W*hat Influences Technological Individualization? AnAnalysisof Antecedents to IT Consumerization Behavior*. https://core.ac.uk/reader/301360300

Miller, K. (2019, September 25). *The Benefits of Online Learning: 7 Advantages of Online Degrees*. Northeastern University Graduate Programs. https://www.northeastern.edu/graduate/blog/benefits-of-online-learning/

Moodle. (2020, August 31). *About Moodle - MoodleDocs*. Docs.moodle.org. https://docs.moodle.org/310/en/About_Moodle/

Neo. (2017). *What is an LMS? What is an LMS used for? - NEO LMS for Schools*. Neolms.com. https://www.neolms.com/what_is_an_lms/

Norman, S. (2016, March 10). *5 Advantages Of Online Learning: Education Without Leaving Home*. ELearning Industry; eLearning Industry. https://elearningindustry.com/5-advantages-of-online-learning-education-without-leaving-home/

Research Gate (2010, January).T*he effect of learning management systems on student and faculty Outcomes* https://www.researchgate.net/publication/248540865_The_effect_of_learning_management_systems_on_student_and_faculty_outcomes

T.J. McGill, J.E. Klobas.(2009). *A task-technology fit view of learning management system impact:* Comput. Educ., 52 (2) , pp. 496-508

Appendix

Survey Instrument

*A task–technology fit view of learning management system impact
**What Influences Technological Individualization? –An Analysis of Antecedents to IT Consumerization Behavior
***Roles of perceived fit and perceived individual learning support in students' weblogs continuance usage intention

Background Information

Gender: Male Female
Age: 16-18, 19-22, 23-25, 26- 30, 31-40, >40
Student: Associates Bachelors
Year: 1, 2, 3, 4
Faculty: FST, FMSS, FEA, FHS

I took one or more online classes prior to the pandemic.
I prefer face to face classes than online classes
I am a more efficient student in face to face classes than in online classes
I learn more in face to face classes than in online classes
I would want to take some online courses after the University resumes face to face teaching.
I would want to take all my courses online after the University moves back to face to face teaching.
I would not want to take any online courses after the University moves back to face to face teaching.

Number of semesters using Moodle
One or more of my teachers used Moodle to teach face to face classes (prior to online delivery)
One or more of my teachers utilized an LMS other than Moodle

If YES
How many semesters have you attended classes that used an LMS other than Moodle?
I attended classes that used an LMS other than Moodle in face to face classes (prior to online delivery)
It would be beneficial to me to attend courses that use Moodle after the University returns to face to face teaching.
It would be beneficial to me to attend courses that use an LMS other than Moodle after the University returns to face to face teaching.

Please complete the following questions about ONLINE LEARNING.

1. Task–technology fit
--Constructs 1 - 3 for paper.
Moodle fits well with the way I like to study online.
Moodle is compatible with all aspects of my online study.
Moodle is easy to use.
Moodle is user friendly.
It is easy to get Moodle to do what I want it to do.
Moodle is easy to learn.
It is easy for me to become more skillful at using Moodle.
New features of Moodle are easy to learn.

Do you think the output from Moodle is presented in a useful format?
Is the information from Moodle accurate?
Does Moodle provide you with up-to-date information?
Do you get the information you need in time?
Does Moodle provide output that seems to be just about exactly what you need?

2. Expected consequences of LMS use
Using Moodle for online classes will help me to accomplish my study more quickly.
Using Moodle for online classes will improve my performance in units.
Using Moodle for online classes will increase my productivity.
Using Moodle for online classes will enhance my effectiveness in my program of study.
Using Moodle for online classes will make it easier to complete my learning tasks.
Using Moodle for online classes will give me greater control over my learning tasks.
Overall, I think that Moodle will be useful in my online studies*
Using Moodle will improve the quality of my online learning*

3. PERCEIVED IMPACT ON LEARNING
Moodle has a large positive impact on my effectiveness and productivity as a student in online classes.
Moodle is an important and valuable aid to me in my online studies.
I learn better online with Moodle than without it.

4.1 Consumerization Attitude - Perceived fit

If my teacher could choose their own Learning Managements System…
PIF_1 …it would fit well with learning online.
PIF_2 …it would fit well with helping me to be efficient in learning online.
PIF_3 .. it would be compatible with my online learning.

4.2 Consumerization Attitude - Expected Performance improvement

If my teacher could choose their own Learning Managements System…
EPI1: …my online learning performance would improve.
EPI2: …my online learning productivity would improve.
EPI3: …I would work faster while learning online.