Evaluating Learning Management Systems at Belmopan Methodist High School: A Task Technology Fit Approach

Itzel Kotch
University of Belize
San Pedro Town, Belize
2019119838@ub.edu.bz

Gian Guerrero
University of Belize
San Pedro Town, Belize
2019119742@ub.edu.bz

Kaylin Hyde
University of Belize
Ontario Village, Cayo District
2017116817@ub.edu.bz

Alyssa Guerra
University of Belize
Orange Walk Town, Belize
2020151843@ub.edu.bz

Abstract

Technology is ever changing and as such, we must continue to evaluate how this affects our learning environment. This study makes use of the Goodhue and Thompson Updated Information System Success Model to evaluate the effectiveness of Google Suites at a secondary institution in Belize. The module comprises four sections namely Task- technology Fit, Consumerization Attitude, Perceived Impact on Teaching and Expected Consequence of Learning Management System (LMS) use. The constructs helped gain a better understanding of Google Suites success and effectiveness. The method of measurement was a survey questionnaire for teachers at Belmopan Methodist Highschool. The results, represented using histograms, indicated that the teachers have a positive response to the constructs of task technology fit, perceived impact on teaching and the expected consequence of LMS use. Consumerization Attitude responses varied due to the fact that most of the teachers have not utilized an LMS other than Google Suites. Overall, the Google Suites utilized by the Belmopan Methodist High School proved successful under the task technology fit theory.

Keywords: Task Technology Fit, Belize, Learning Management Systems, Secondary Institutions

Introduction

Technology is a growing part of our daily lives. Society has grown to depend on the use of technology for just about anything. For technology to be helpful, it must be capable of performing the task that the user must perform. This is where Task technology fit (TTF) comes into play. According to Baas 2010, "Task-technology fit (TTF) is the degree to which a technology assists an individual in his or her portfolio of tasks." It is most likely to have a positive impact on individual performance. However, a particular task requires a specific type of technology. Information systems contain a great variety of tools and technologies which cause people's preference to change quickly with technological progress. Then the technology can be said to be a task-technology fit (Bass, 2010). If the tasks and the technical characteristics do not fit, it can lead to drawbacks in the time frame of task performance. The user will then need to choose another software or tool to perform the task (Do, 2018).
Due to COVID 19, organizations and other educational institutions seek ways to cope with the pandemic in Belize. Educational institutions rely on Learning Management Systems to connect with students for e-learning. As learning is now based online, several technologies are being utilized as task-technology fit for teachers. In addition, the originality of the research stems from unexpected and necessary virtual learning in Belize due to the pandemic. One school in particular, Belmopan Methodist Highschool (BMHS), is a secondary institution established in 2013. It is a partial Methodist and Government aided high school that has both developed in infrastructure and number of students. With a total of 436 students, Belmopan Methodist Highschool was able to transition from face-to-face classes into a fully functional online organization using Google Suites. BMHS uses Google Suites to prepare material for classes and conduct virtual learning sessions. Google Suites is a collection of cloud computing, productivity and collaboration tools, software and products developed and marketed by Google. Some features include Google Workspace that consists of Gmail, Meet and Chat for communication; Google Drive for storage; and Google Docs Suite for Content Creation. The education edition also includes a learning platform, Google Classroom (TeachThought Staff, 2019).

Significance

This research seeks to examine whether Google Suites is an effective Learning Management System (LMS) for teachers to communicate with students. Each institution uses a different form of LMS to reach out to its students. The study of the task-technology fit at Belmopan Methodist High School can be helpful to other educational institutions that may be having a hard time coping with online classes. This research will identify and share the effectiveness of Google Suites for e-learning.

Objectives

To evaluate the effectiveness of using Google Suites by employing Goodhue and Thompson's Model.
To determine the usefulness of task-technology fit at Belmopan Methodist High School.

Goals

The goal of this research is to identify the effectiveness of the Learning Management System using Task-technology Fit at Belmopan Methodist High School. This research seeks to give its readers a clearer understanding of how an institution like Belmopan Methodist High School copes with changes in technology and learning environment.

Literature Review

E-learning is a fundamental part of the daily lives of individuals and society. Adapting to e-learning strategies can be very helpful and beneficial for students and teachers. Raboca and Carbuarean (2015); define e-learning portals as a start to develop a new way of providing education – faster and broader coverage, bringing education closer and more available for its stakeholders. E-learning makes learning easier and accessible at any time or place. Student enrollment is more likely to increase, due to the easy access to education, especially for those students in the workforce. According to Raboca and Carbuarean (2015); they believed that with the reduced bureaucracy, many students can access easier educational programs and can even increase the number of graduates. This literature review examines; the perception of task technology fit having a positive impact on individual performance.

The developing literature on the adequacy of the Task Fit Technology explores mainly universities. 'Effects of Task-Technology fit and Learning Styles on Continuance Intention to use e-Learning App' used data collected from 168 undergraduate students who enrolled in full-time courses at Taylor's University Malaysia (Gan, Hassim, Jayasainan & Tan, 2018). Another study conducted by Funmilola O.Omotayo and Abdul Rasaq Haliru (2020) measured information gathered from selected universities in Nigeria. Similarly, 'Task-technology fit aware expectation-confirmation model towards understanding of MOOCs continued usage' and 'Online learning usage within Yemeni higher education: The role of compatibility and task-technology fit as mediating variables in the IS success model' focused on universities to conduct their studies (Rong, Tang, Xiong, & Yin, 2017), (Aldholay & Isaac, 2019). Another similarity to note is the method of measurement among the literature. Most studies used survey questionnaires. For instance, 'Applying an Extended Task-Technology Fit for Establishing Determinants of Mobile Learning: An Instant Messaging Initiative' and 'Extending the Task-Technology Fit (TTF) Model to E-Textbook Usage by Students and Instructors' used survey questionnaires (Bere, 2018), (Abdinnour, Chaparro & Jardina, 2021). Also, Task-Technology Fit Model: The Factors Affecting Students' Academic Performance in Higher Education used a questionnaire survey on Task-technology fit theory to gather data (Al-Rahmi1, Alismaiel & Shamsuddin, 2020). Lastly, a significant amount of these studies focused primarily on students. Task-Technology Fit Model: The Factors Affecting Students' Academic Performance in Higher Education circulated their surveys among a total of 206 students (Al-Rahmil et al., 2020). Likewise 'Task-technology fit awareness expectation-confirmation model towards understanding of MOOCs continued usage' which surveyed students in a university of China from August to October (Rong et al., 2017). Both studies conducted by (Gan, et al., 2018) and (Haliru & Omotayo, 2020) were centered toward undergraduate students.

There are 3 major differences that can be seen between the literature gathered. These differences are the methods of measurement, sample size, and lastly the country that the research was conducted in. An important distinction between these studies is the method of measurement used when being conducted. Measurement is the process of associating numbers with physical quantities and phenomena. The methods vary for each study. There were two types of methods used which were surveys and interviews. While most of the research chosen were surveys but "Tool Choice for E-Learning: Task Technology Fit through Media Synchronicity" used interviews as their method to gain information. Another major difference between the studies are the samples used when conducting the experiment. The literature varies in both sample size and focus. In "Applying an Extended Task-Technology Fit for Establishing Determinants of Mobile Learning: An Instant Messaging Initiative" Data was collected from 223 participants where as in "Effects of Task-Technology fit and Learning Styles on Continuance Intention to use e-Learning App" The sample consisted of 168 undergraduate. The focus of the samples also varied, while some focused on male and female participants some focused on only student participants and "Extending the Task-Technology Fit (TTF) Model to E-Textbook Usage" focused on both students and teachers. Lastly Country, 'Task-technology fit aware expectation-confirmation model towards understanding of MOOCs continued usage' surveyed students in a university in China , meanwhile "Effects of Task-Technology fit and Learning Styles on Continuance Intention to use e-Learning App' used data collected from students who enrolled at Taylor's University Malaysia (Gan, Hassim, Jayasainan & Tan, 2018) lastly another study conducted by Funmilola O.Omotayo and Abdul Rasaq Haliru (2020) measured information gathered from selected universities in Nigeria.

There are many other e-learning tools that instructors use for online and hybrid courses for delivering online courses. Sun & Wang (2014) mentioned in their study, which was conducted using a research model of task-technology fit through media synchronicity based on the premises of both Task-Technology

Fit Theory and Media Synchronicity Theory, that in future studies, more e-learning tools need to be included and their attributed need to be characterized with a more refined scale. This will enrich the research hypotheses proposed in this study and make them more realistic. In addition, the results will provide practitioners such as instructors and IT administrators more guidance on how to choose among the numerous options of e-learning tools for different learning tasks. Tan, Hassim, Jayasainan & Gan (2018) mentioned in their study that characteristics of every learner determine their individual-task fit (ITF) and continuance intention with consideration of each of their ongoing use and the ability to gain command and control of his or her performance. There are currently limited studies on the aspects of the individual learner in determining the continuance intention usage of e-learning tools (IU). Although many literatures supported the idea that ITF explained individual differences in perception of task, the discussion is limited to one's concern of whether the task is suitable to him/ her. Therefore, the notion of ITF failed to account for learner differences in learning styles.

Methodology

The study was conducted in the middle of the second semester at Belmopan Methodist High School. A permission letter was sent to the administration and following the acceptance, a survey questionnaire was formulated and distributed via the school email system. It was indicated that the responses were anonymous and confidential. A vast amount of literature used more than one tertiary level institution to gather information. In contrast, this study was conducted at a secondary intuition which limited the participants to the 24 teachers at the school. Time constraint was a limitation for this method of measurement along with the lack of responses from research participants. Previous literature identified the assumption that characteristics of every learner determine their individual-task fit (ITF). limitations of previous studies also include the notion that ITF failed to account for learner differences in learning styles.

Participants & Measurements

The participants that were targeted for this study were teachers at Belmopan Methodist High School that use Google Suites for online teaching. In order to conduct this research, a questionnaire was prepared to collect the data. Questions were created using the model created by Goodhue and Thompson (1995) to ensure effectiveness. The survey questionnaire consisted of seven question sections which gathered participant's Background Information, Teaching Preference, Prior Learning Management System (LMS) Use, Task-Technology Fit, Expected Consequences of LMS Use, Perceived Impact on Teaching and Consumerization Attitude. Most of their responses were measured using a 7 point Likert scale with one point as 'Strongly Agree' and the other 'Strongly Disagree'. The first section of the model, The Task-Technology Fit (TTF), theory provides a means of quantifying the effectiveness of technology in a system by assessing the relationship between the technology and the tasks the technology aims to support. For the purpose of this study, the efficiency of Google Suites and the ease of use for teachers to provide accurate information to students. Consumerization Attitude refers to the participants view on whether or not Google Suites is most effective for them or if they rather use an LMS of their choice. The Expected Consequences of LMS use is to determine whether Google Suites is beneficial to teachers for e-learning in the aspects of productivity, quality and control. Lastly, Perceived Impact on Teaching refers to teachers identifying Google Suites as a tool that contributed to their effectiveness and productivity as online teachers. Below (Figure 1) presents Goddhue and Thompson's Model.

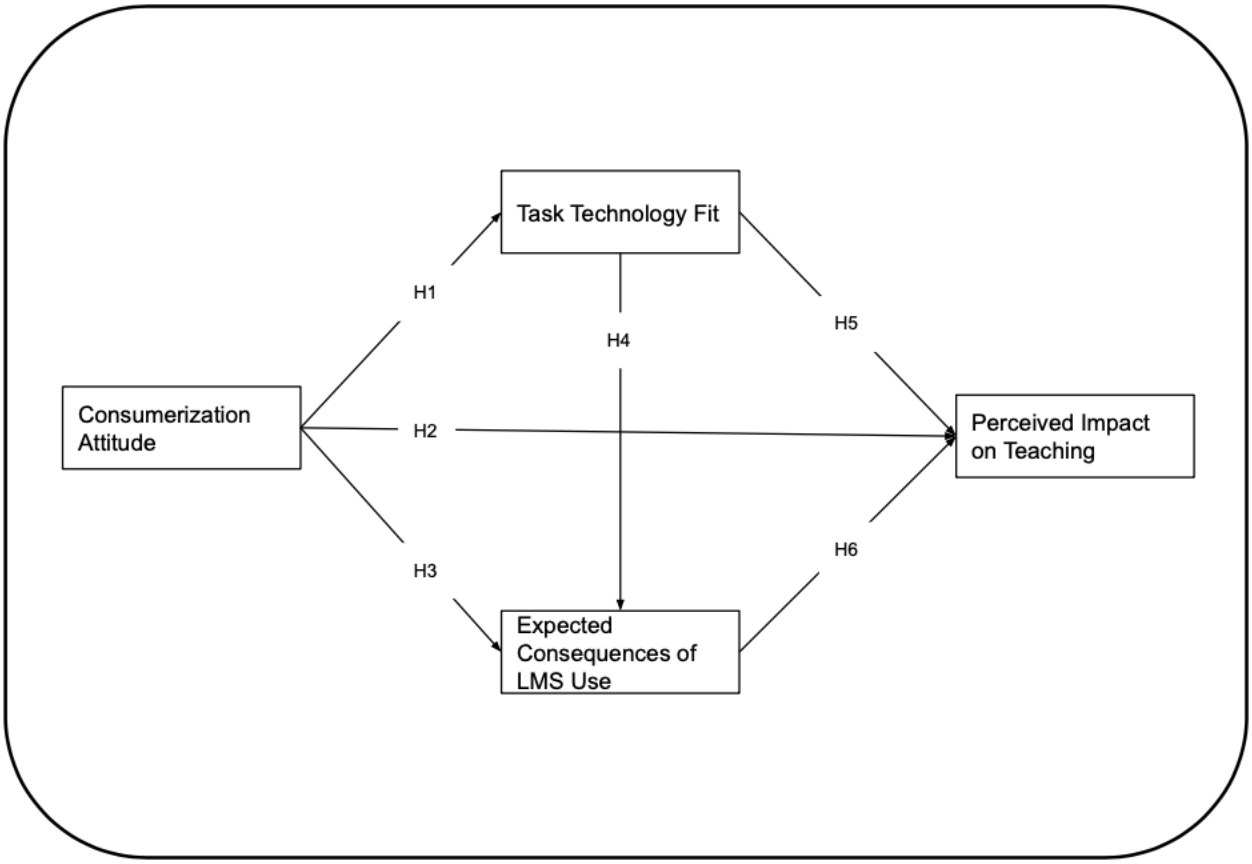

Figure 1

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.

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

Table 1. Measurement Items for Questionnaire

Construct	Survey Questions
Task Technology Fit - Lecturers	Q1. Please indicate your gender Q2. Please indicate your age range Q3.Please indicate your highest degree attained Q4. Please indicate the department you teach in Q6. Please indicate which Learning Management System (LMS) you have used:
Teacher Preference	Q1: I prefer teaching face to face rather than online.(Strongly disagree- strongly agree) Q2. I am more effective teaching face to face than online. Q3. Students learn more in my face to face classes than online. Q4. I would want to teach some online courses after BMHSl resumes face to face teaching. Q5. I would want to teach all my courses online after the BMHS moves back to face to face teaching. Q6. I would not want to teach any online courses after the BMHS moves back to face to face teaching.
Prior Learning Management System (LMS) Use	Q1: Please state the number of semesters you have used Google Suites. Q2: I used Google Suites to facilitate teaching face to face classes prior to the high school's move to online delivery. Q3: I have taught classes utilizing an LMS other than Google Suites. Q4. How many semesters have you taught using an LMS other than Google Suites. Q5. I used an LMS other than Google Suites to facilitate teaching face to face classes (prior to online delivery) Q6. I plan to continue using Google Suites to enhance my teaching after we return to face to face teaching. Q7. I would like to continue using my preferred LMS to enhance my teaching after we return to face to face teaching.
Task-Technology Fit	Q1: Google Suites fits well with the way I like to teach online. Q2: Google Suites is compatible with all aspects of my online teaching. Q3: Google Suites is easy to use. Q4: Google Suites is user friendly. Q5: It is easy to get Google Suites to do what I want it to do. Q6: Google Suites is easy to learn. Q7: It is easy for me to become more skillful at using Google Suites. Q8: New features of Google Suites are easy to learn. Q9: Do you think the output from Google Suites to the students is presented in a useful format? Q10: Can you provide accurate information to your students with Google Suites? Q11: Can you provide up-to-date information to your students with Google Suites? Q12: Can you provide information students need in time using Google Suites? Q13: Can you provide information that seems to be just about exactly what your students' need with Google Suites?

Expected Consequences of LMS use	Q1: Using Google Suites will help me to accomplish my online teaching more quickly. Q2: Using Google Suites will improve my online teaching performance. Q3: Using Google Suites will increase my online teaching productivity. Q4: Using Google Suites will enhance my effectiveness as a teacher while teaching online. Q5: Using Google Suites will make it easier to complete my teaching tasks while teaching online. Q6: Using Google Suites will give me greater control over my teaching tasks while teaching online. Q7: Overall, I think that Google Suites will be useful in my ability to teach online. Q8: Using Google Suites will improve the quality of my online teaching.
Perceived Impact on Teaching	Q1: Google Suites has a large positive impact on my effectiveness and productivity as an online teacher. Q2: Google Suites is an important and valuable aid to me in my online teaching. Q3: I teach better online with Google Suites than without it
Consumerization Attitude	Q1: If I could choose my own Learning Managements System it would fit well with teaching online. Q2: If I could choose my own Learning Managements System it would fit well with helping me to be efficient in teaching online. Q3: If I could choose my own Learning Managements System it would be compatible with my online teaching. Even when there was no one around to tell me what to do Q4: If I could choose my own Learning Managements System my online teaching performance would improve. Q5: If I could choose my own Learning Managements System I would work faster while teaching online.

Data Analysis

A total of 18 teachers out of 24 from the Belmopan Methodist High School participated in the study by answering the surveys sent out. The responses varied from 1, which signified strongly disagree, to 7, which signified strongly agree.

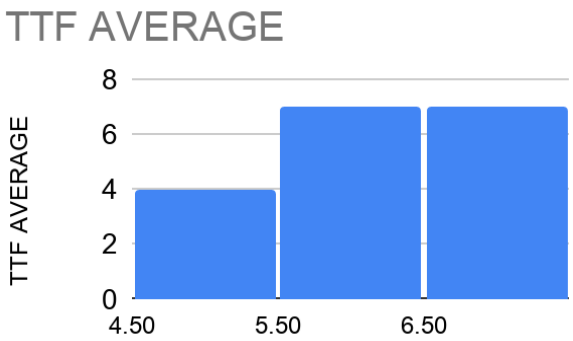

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Figure 2

Figure 1 showcases the teacher's satisfaction with using the Learning Management system, being Google Suites. 7 teachers' ratings average 6.50 above. 6 teachers' ratings averaged between 5.50 and 5.50. 4 teachers ratings averaged between 4.50 and 5.50. None of the teachers rated it below 4. Overall, the response under the construct Task-Technology Fit is positive which signifies that teachers are satisfied with the information system being used, Google Suites, and believe it is suitable for their teaching.

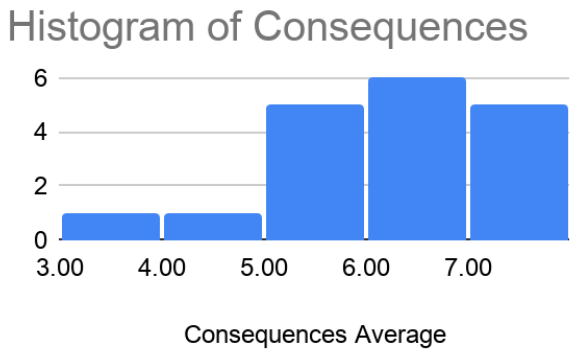

Figure 3

Figure 2 showcases the outcome of using the LMS Google Suites. 16 teachers showed ratings of 5 and above. Whereas, 2 teachers showed ratings below 5. Based on the response, the majority of the teachers experience having a positive outcome of using Google Suites.

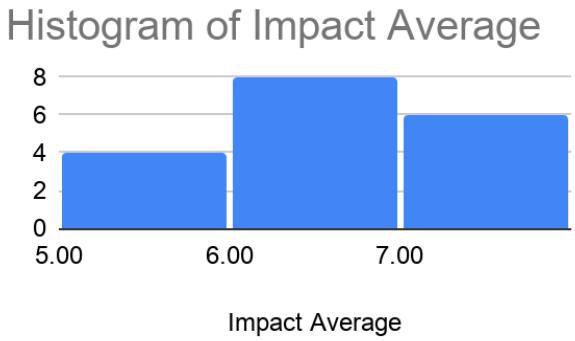

Figure 4

Figure 3 showcases the impact that Google Suites has on teacher's effectiveness and teaching. All respondents agreed that the Learning Management System does have an impact in their teaching style, with all respondents having rating averages of 5 and above.

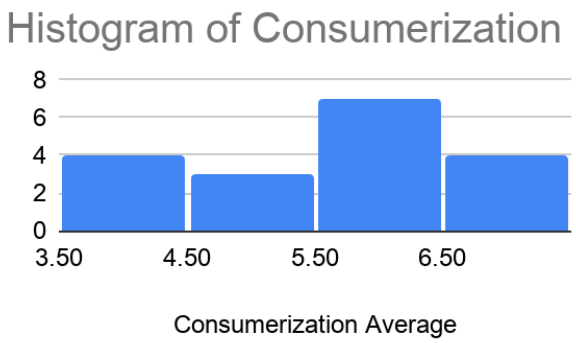

Figure 5

Figure 4 showcases teachers expected performance improvement. 14 teachers agree that using another Learning Management System will help improve their teaching even more, with rating averaging being 4.50 and above. Whereas 4 teachers disagree that using another LMS might help improve their teaching or ease of use.

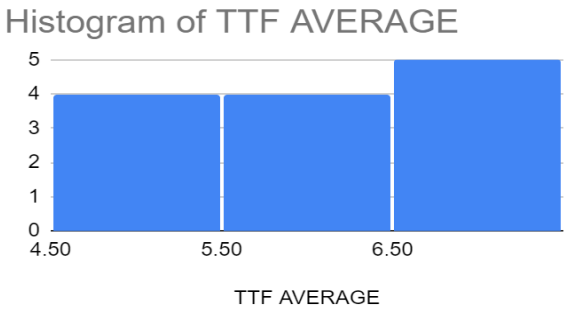

Figure 6

Figure 6 showcases the perception of task technology fit of participants who have used only Google Suites to teach their classes. This includes a total of 13 out of the 18 teachers surveyed. Just as shown in Figure 1, teachers who have used only Google Suites believe the technology performs the tasks needed to be done by the teachers.

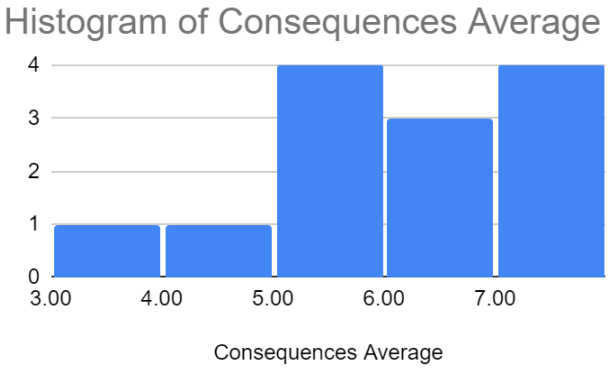

Figure 7

Figure 7 showcases the expected consequences of using Google Suites of teachers who have used only Google Suites and no other LMS in their online teaching. Most of the teachers expect a positive impact/consequence in the use of Google Suites, with 12 teachers having rating averages above 4 and only 1 teacher having rating averages below 4.

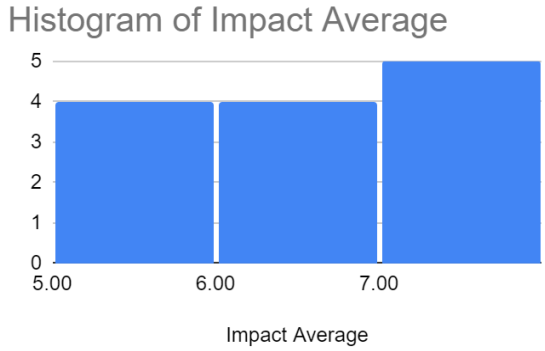

Figure 8

Figure 8 showcases teachers' perception on the impact Google Suites has on their teaching. These teachers include only those who have used Google suites. Averages show that most teachers who have used only Google Suites to teach online, agree that the LMS used has a positive impact on their online teaching.

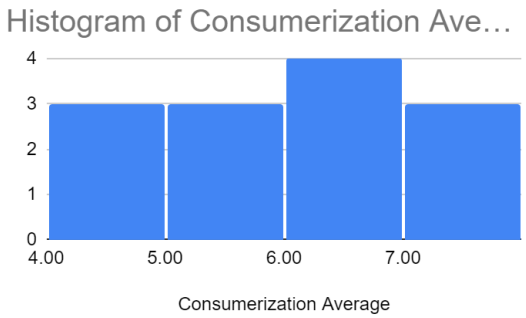

Figure 9

Figure 9 showcases teachers expected performance improvement of the LMS used. As compared to Figure 5, this figure includes teachers who have only used only Google Suites and no other learning management system to teach. Teachers who have utilized only Google Suites believe that there is an LMS that could possibly be more effective in meeting their teaching needs, with all 13 responses averaging from 4 and above.

Discussion

The teachers at Belmopan Methodist High School use Google Suites to deliver course content to their students. This research was conducted and analyzed to provide results in regards to the constructs of task technology fit, consequences of learning management system use, perceived impact on teaching and consumerization attitude.

Starting off with task technology fit, all 18 teachers' rating averages were 4 and above. Questions under this construct asked teachers about the technologies performance and usage such as the ease of use, user friendliness, and of learning. The responses under this construct display that all teachers agree that the information technology used, Google Suites, has a positive impact on their performance and the capabilities to perform tasks as needed to be done by the teachers themselves.

Furthermore, under the consequences of the learning management system use construct, statements on the survey pertained to the teachers expectation or outcome of using Google Suites such as how it will improve their online teaching performance. 17 of the teachers rated most statements with a 4 and above, whereas 1 teacher rated more statements 4 and below. This signifies that they have a positive attitude towards the outcome provided by Google Suites, therefore supporting hypothesis number 4 which states that task-technology fit will have a positive impact on expected consequences of the organizations LMS use.

The perceived impact on teaching construct had averaged from 5 to 7. This construct asked teachers on the impact Google Suites has on their teaching and it included statements such as the importance of the LMS in their online teaching. As the results show, 18 of the teachers agreed that Google Suites has a positive impact on their online teaching and positively affects their effectiveness and productivity as an online teacher.

Lastly, the consumerization construct asked teachers on their perceived fit/expected performance improvement. Responses under this construct varied. The highest rating averaged between 5.5 to 6.5, with 7 respondents. This signifies that teachers believe that another Learning Management system could possibly be much more effective than Google Suites. Of the 18 teachers, 13 have used only Google Suites and no other LMS before using Google Suites. The remaining 5 teachers have utilized an LMS other than Google Suites. This could explain the reason as to why most teachers perceive that another LMS could possibly be more effective than the current LMS used, being Google Suites.

Conclusion

The research paper was conducted to identify if the information system at Belmopan Methodist Highschool is successful or not, in order to attain precise information a questionnaire was prepared to collect the data required. This Questionnaire consisted of seven question sections which gathered participant's Background Information, Teaching Preference, Prior Learning Management System (LMS) Use, Task-Technology Fit, Expected Consequences of LMS Use, Perceived Impact on Teaching and Consumerization Attitude. Most of the responses were measured using a 7 point Likert scale with one point as 'Strongly Agree' and the other 'Strongly Disagree'. There were four factors considered when determining effectiveness; Consumerization Attitude, expected consequences of LMS use, perceived impact on teaching, and Task Technology fit. The literature review conducted examined the perception of task technology fit having a positive impact on individual performance. A total of 18 teachers out of 24 from the Belmopan Methodist High School participated in the study by answering the surveys sent out. The results gathered on the survey presented that; all the teachers agree that the information technology used(Google Suites) has a positive impact on their performance, they have a positive attitude towards the outcome provided by Google Suites, they agreed that Google Suites has a positive impact on their online teaching and positively affects their effectiveness and productivity as an online teacher, lastly they believe that another Learning Management system could possibly be much more effective than Google Suites. To

conclude, the evidence gathered from the survey questions determines that Google Suites is a successful tool for BMHS.

Limitations

One of the few limitations concerning our study include time constraints. The researchers did not have enough time to get all the responses from the teachers of Belmopan Methodist High school. If more time was allotted then maybe all the teachers could have participated, which could have allowed for more accurate results. Time also limited our analysis of the data. With more time we could have found better ways in perceiving the data allotted. Statistical analysis and report could have also been implemented. Another limitation is that the research was conducted during the Covid-19 Pandemic. This is a limitation because interviews could have also been implemented to gather data for the research but due to the pandemic face to face interactions were kept minimal. Lastly the availability of information was also a major limitation. It was difficult in finding information about BMHS as we had to rely on the information gathered from staff to conduct our research. Other than this, resources on task technology fit are very limited for the Caribbean. More specifically, for Central America or Belize.

Future research

As we can see, the research done achieved its specific aim and provided a structure for continuous understanding. Nonetheless when using this research as a foundation in the future certain limitations can be avoided. The first limitation which can be avoided is the Covid-19 pandemic. When the Covid-19 pandemic is no longer a variable in the situation much more information can be gathered by having face to face interactions which would allow us to receive more data from the BMHS teachers. When conducting future research the limitation of time can also be avoided as there would not be any pressure to meet a deadline, hence we can carefully analyse the data received. These constraints played a huge factor on the analysis gathered.

References and Citations

Ali Mugahed Al-Rahmi, Alina Shamsuddin, Omar A Alismaiel (2020). Task-Technology Fit Model: The Factors Affecting Students' Academic Performance in Higher Education. Universal Journal of Educational Research, 8(12), 6831- 6843. DOI: 10.13189/ujer.2020.081249.

Baas, P.,(2010) *TA S K-T E C H N O L O G Y F I T I N T H E W O R K P L ACE*. [online] Erim.eur.nl. Available at: <https://www.erim.eur.nl/fileadmin/default/content/erim/research/centres/sbni/projects/nwow/about/who_are_we/st2009/baas%20(2010)%20-%20task-technology%20fit%20in%20the%20workplace%20-%20aff.pdf> [Accessed 18 April 2021].

Bere. A. (2018). Applying an Extended Task-Technology Fit for
Establishing Determinants of Mobile Learning: An Instant Messaging Initiative. Journal of Information Systems Education, 29(4), 239-252.

Isaac, O., & Aldholay, A. (2019). Online learning usage within yemeni higher education: The role of compatibility and task-technology fit as mediating variables in the IS success model. ScienceDirect.com | Science, health and medical journals, full text articles and books.
https://www.sciencedirect.com/science/article/abs/pii/S0360131519300417

McGill, T. J., & Klobas, J. E. (2009, February). A task–technology fit view of learning management system impact. ScienceDirect.com | Science, health and medical journals, full text articles and books.
https://www.sciencedirect.com/science/article/abs/pii/S0360131508001541

Omotayo, F. O. (2020). *Perception of task-technology fit of digital library among undergraduates in selected universities in Nigeria*. ScienceDirect.com | Science, health and medical journals, full text articles and books. https://www.sciencedirect.com/science/article/abs/pii/S0099133319303507

Ouyang, Y., Tang, C. U. I., Rong, W., Zhang, L., Yin, C., & Xiong, Z. (2017). Task-technology Fit Aware Expectation-confirmation Model towards Understanding of MOOCs Continued Usage Intention. *Proceedings of the 50th Hawaii International Conference on System Sciences*.
https://doi.org/10.24251/hicss.2017.020

Sun, J., & Wang, Y. (2014). Tool Choice for E-Learning: Task-Technology Fit through Media Synchronicity . *Information Systems Education Journal (ISEDJ)*, *12*(4).
https://files.eric.ed.gov/fulltext/EJ1140775.pdf**.**

Tan, S. Z., Hassim, N., Jayasainan, S. Y., & Gan, P. C. K. (2018). Effects of Task-Technology fit and Learning Styles on Continuance Intention to use e-Learning App. *Proceedings from European Conference on E-Learning*.
TeachThought Staff. (2019, November 15). What Is G Suite for Education? Retrieved from TeachThought website: https://www.teachthought.com/technology/what-is-google-for-education/