The Success of a Learning Management System: The University of Belize

Completed Research Paper

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Abstract

While there is a great amount of already-conducted research on this particular topic –Information System Success Models, there is still very little that includes the University of Belize's Moodle system. The study provides an empirical test of a variation of the Delone and McLean Information System Success model with regards to the Moodle system. The six dimensions of the model include: information quality, system quality, service quality, use, user satisfaction and perceived net benefits. Two separate constructs were added to the already existing dimensions – namely: Computer self-efficacy measure and Complementary Technology quality. These were used due to Belize being a developing country. Moodle which is used by the University of Belize, is a web-based system which allows both lecturers and students to upload documents, conduct online classes in the future and both lecturers and students can track student progress for individual courses. This research tried to determine the success of the Moodle Information System at the University of Belize. 50 Questionnaires were answered by students with the primary focus of this study was to determine the benefits moodle provides to its users – the students. The research concludes by discussing the Implications, Limitations and recommendations to Moodle.

Keywords: Information system, Success Model

Introduction

Moodle is a web based Learning Content Management System (LCMS) designed around pedagogical principles, namely a social construtivist philosophy using the collaborative possibilities of the Internet. Due to its flexibility it can also be used in more outcome-oriented classroom environments. Moodle has many features expected from an e-learning platform including Forums, content management (Resources), Quizzes with different kinds of questions and several activity modules (Work in progress, 2006). Moodle serves teachers and learners not only at the University of Belize but across the globe. Teachers can also improve Moodle platform by implementing web-based peer assessment. These works are used to enhance the student cognitive schema, helping them to construct their knowledge, and promoting the student positive attitudes towards discussing and cooperating with peers. It is evidenced that students increase their skills to undertake learning by using the information technology (The role, 2008).

Moodle was developed in 2002 by Martin Dougiamas to help educators create online courses with a focus on interaction and collaborative construction of content. Since then, the main development of Moodle has been led by Martin and the core team at the Moodle Headquarters, as well as hundreds of other developers around the world. This research based upon Moodle was to determine whether it was a good system for the University of Belize's faculty and students. It measures how satisfied the students and lecturers were with the system that is currently in use. With the information gathered, the University of Belize can now make a decision whether to keep the platform or switch it for a better one.

Literature review

A learning management system, or LMS, is a collaborative platform used to manage online learning (or "e-learning") courses. Online learning management systems are typically used in the business and education sectors, and in the business world, you might also think of a learning management system as a training management system. (Bridge, 2017)

Typically, a learning management system provides an instructor with a way to create and deliver content, monitor student participation, and assess student performance. A learning management system may also provide students with the ability to use interactive features such as threaded discussions, video conferencing, and discussion forums. The Advanced Distance Learning group, sponsored by the United States Department of Defense, has created a set of specifications called Shareable Content Object Reference Model (SCORM) to encourage the standardization of learning management systems. (TechTarget, 2007)

As a highly flexible LMS, Moodle can be used to conduct courses online or to support face-to-face teaching, learning and training. It can also be extended with over 500 plugins for assignments, quizzes, grading, certification, and social and collaborative learning. Today Moodle has been adopted by over 230 countries where Moodle communities thrive. As an open source platform, Moodle users benefit from a global community of developers who are actively engaged in improving the user experience. Moodle is hands down the most-widely used learning management system (LMS) by organizations of all shapes and sizes. But Moodle is not the world's best LMS just because it's so widely used—Moodle is the world's best LMS because it is user-friendly, highly-configurable (flexible), and feature-rich. (Lambda Solution, 2017)

Methodology

This research project analyzed all Information System qualities of the University of Belize Moodle system from a student's perspective. This system was selected based on the information system success model created by William H. Delone and Ephraim R. McLean in the year 1992 which used six (6) dimensions of the model(Delone & McLean, 2003), namely: Information, system and service quality, usage intentions, user satisfaction and overall system benefits to evaluate and determine the information system success of Moodle. Because Belize is globally known as a developing country, the traditional model has been tailored to accommodate the many severe faults encountered by the country with regards to Information System success. Organizations like the University of Belize, have invested a great deal in information systems only to be disappointed by the lack of the skill set needed to use the program combined with constant need to keep the program up-to-date in order to keep it functioning properly; these factors contribute greatly to the continued failure of information systems in Belize.

In reference to the lack of factors contributing to the systems' success, all dimensions of this model as well as testing the efficiency of the system, its reliability, overall effectiveness along with the availability of necessary skill sets were all carefully evaluated.

In union with previous research, the study endeavored to encompass the Delone and McLean model of information system success to the technology in the developing country. The research model utilized in this study was an altered version of the traditional model including complementary technology quality and self-efficacy as a means of measurement. These additions are fundamental to the overall assessment of information system success in developing countries dealing with faulty internet connections and hardware are common. The study concentrated on the perspective of the students who use the University of Belize's Moodle system regularly and used the six dimensions of the information system success model with the additional measurements as reflected in Figure 1.

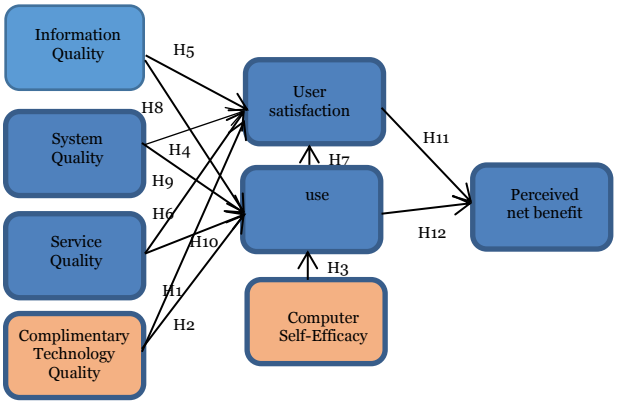


Figure 1. Modified Research Model Developing Countries

Figure 1 shows the six constructs of the Delone and Mclean model including the additional measurements used to authenticate this study.

Hypothesis

H1. Complementary technology quality will positively impact system quality.
H2. System quality will positively impact user satisfaction.
H3. Information quality will positively impact user satisfaction.
H4. Service quality will positively impact user satisfaction.
H5. Use will positively impact user satisfaction.
H6. Information quality will positively impact use.
H7. System quality will positively impact use.
H8. Service quality will positively impact use.
H9.User satisfaction will positively impact perceived net benefit.
H10.Use will positively impact perceived net benefit.
H11. Computer Self Efficacy Measure will positively impact user satisfaction

Sampling and data collection

The data that was collected for analysis came from a sample of students attending the University of Belize, Belize City. The methods used to collect data were purposive sampling which is selecting particular participants based on a criteria we set. Convenience sampling which is using the available participants of the targeted population of students. 45 questionnaires distributed - 45 serviceable returned (rate: 100%) 7-point Likert Scale - strongly agree (7) to strongly disagree (1).Out of 45 questionnaires all were usable and were returned; yielding response rate at 100% which is acceptable.

Data Analysis and results

The data was gathered from 45 students of the University of Belize from the Belize City Campus. We are using the applied research methodology. We will present 8 histograms.

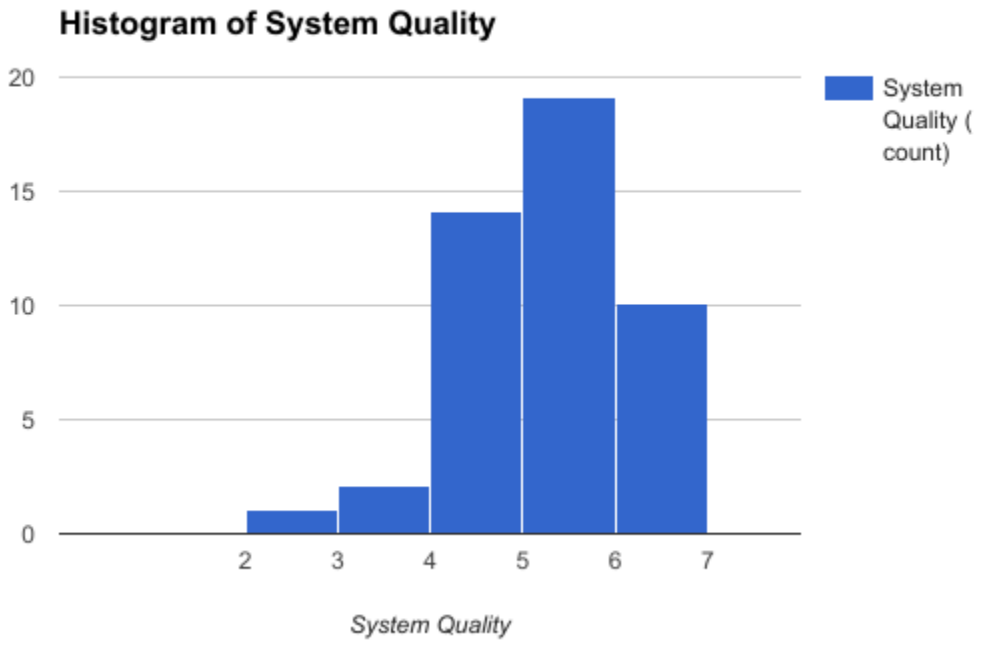
Characteristic of Respondent

Gender	Age	Level of Education	Years Enrolled in school
Male- 48%	17-19- 22%	Associates- 22%	1- 29%
Female- 52%	20-22- 58%	Bachelors- 78%	2- 11%
Total- 100%	23-24- 16%	Total- 100%	3- 36%
	>25- 4%		4- 20%
	Total- 100%		5- 4%
			6
			7
			Total- 100%

Information Quality		
Strongly Agree- Strongly Disagree	Number of Participants	Percentage
1	-	
2	-	
3	27	60%
4	14	31%
5	4	8%
6	-	-
7	-	-

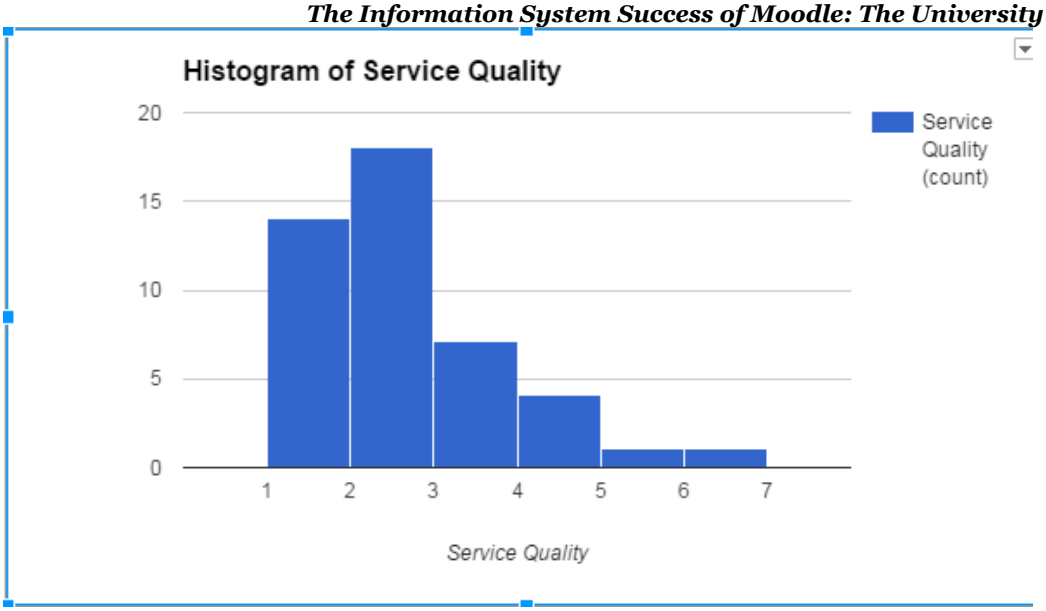
The graph demonstrates that majority of the students aren't satisfied with the information being provided by Moodle. So it's very essential that the teachers prepare better readily available notes for the students to access in order to have improvement in Information Quality.

System Quality		
Strongly Agree- Strongly Disagree	Number of Participants	Percentage
1	-	
2	1	2%
3	2	4%
4	14	31%
5	19	42%
6	10	22%
7	-	



This graph demonstrates that more than half the students suggest that Moodle is easy to use and is very user friendly for them to operate.

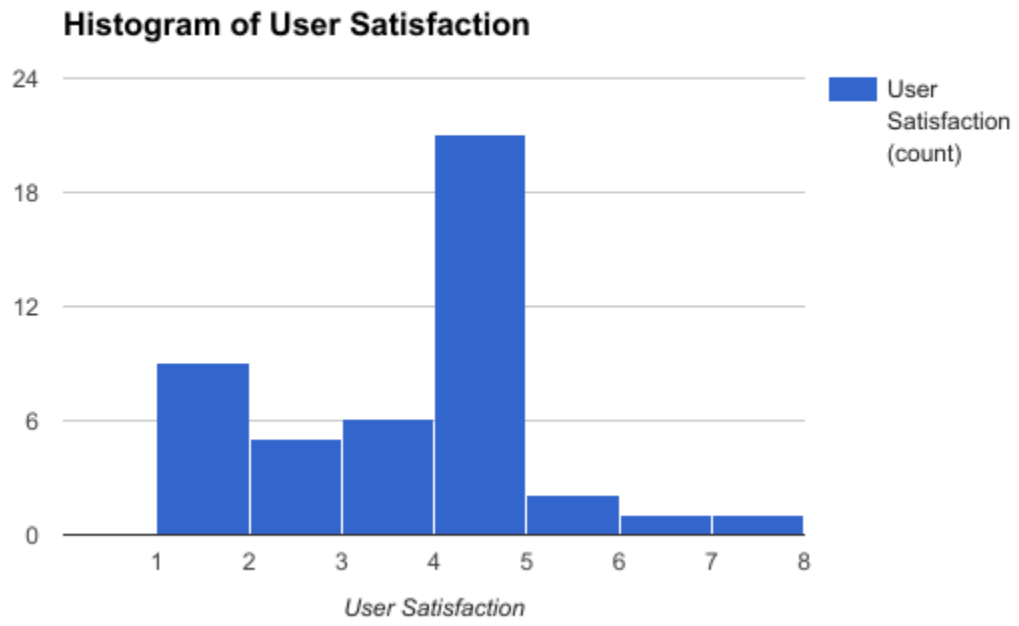
Service Quality		
Strongly Agree- Strongly Disagree	Number of Participants	Percentage
1	14	31%
2	18	40%
3	7	15%
4	4	8%
5	1	2%
6	1	2%
7	-	



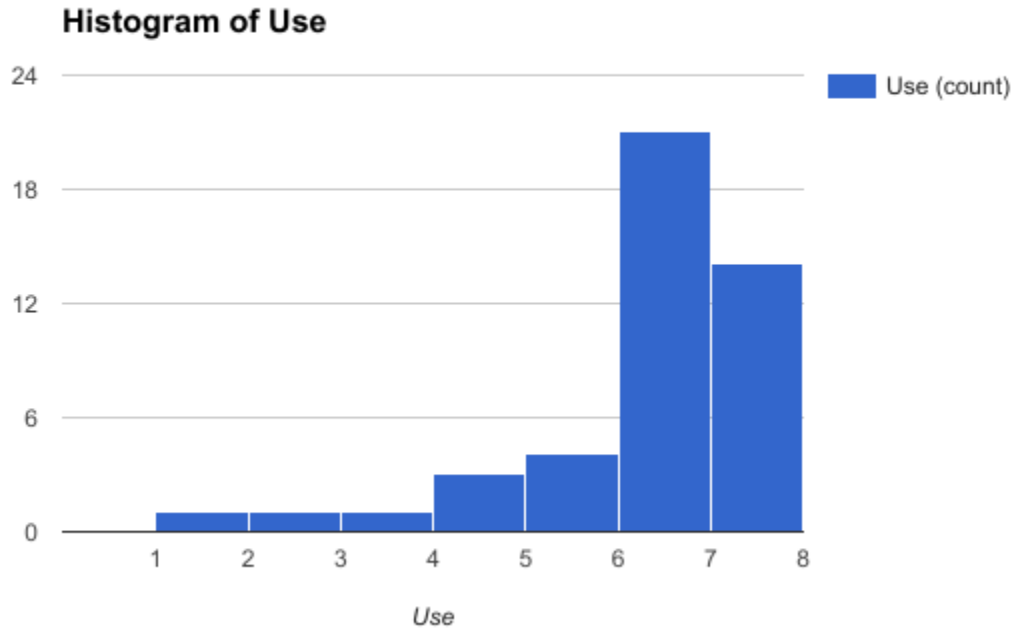
Majority of the students are having issues with the Service Quality. The support staff doesn't update Moodle frequently as well as support staff doesn't respond to user promptly if they come across any problems while using Moodle.

User Satisfaction		
Strongly Agree- Strongly Disagree	Number of Participants	Percentage
1	9	20%
2	5	11%
3	6	13%
4	21	46%
5	2	4%
6	1	2%
7	1	2%

Use		
Strongly Agree- Strongly Disagree	Number of Participants	Percentage
1	1	2%
2	1	2%
3	1	2%
4	3	6%
5	4	8%
6	21	46%
7	14	31%

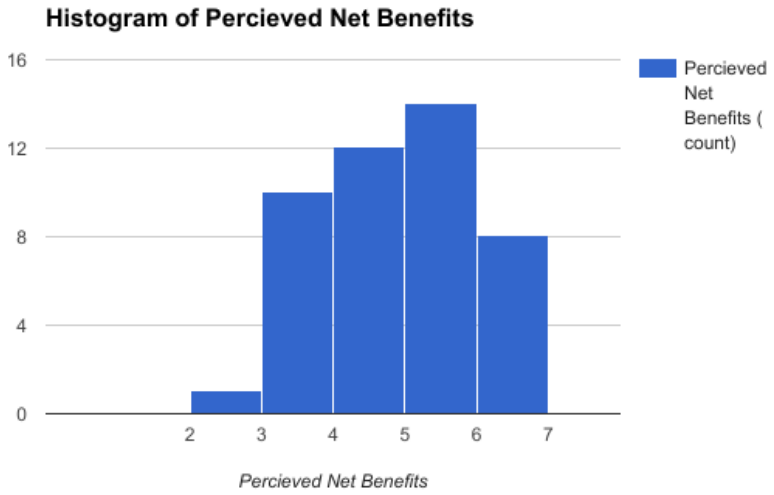


Most students aren't satisfied with the moodle service. Moodle hasn't met most students expectations and don't respond positively to it. This could be because of the poor service quality.



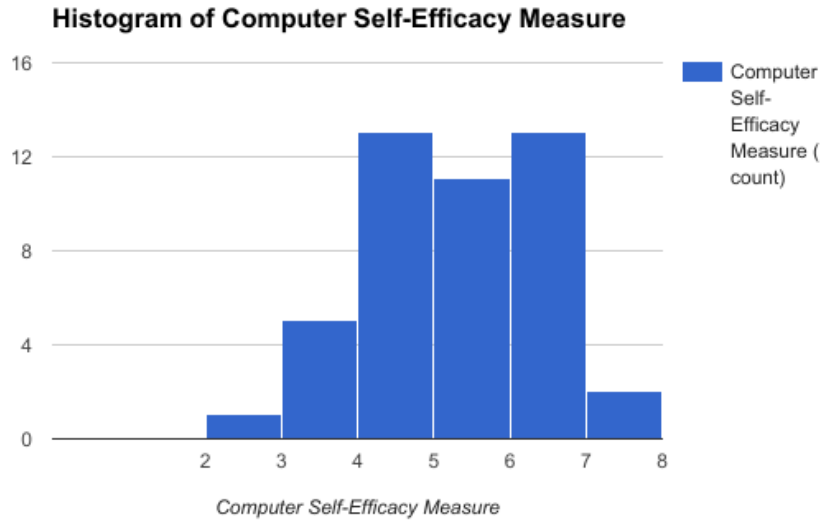
The usage rate of Moodle is very high. Majority of students are required to use this software, which shows that teachers are trying to incorporate moodle more. It has made student life more easy because they are able to access information and homework easily as well as having a medium to communicate with the teachers.

Perceived Net Benefits		
Strongly Agree- Strongly Disagree	Number of Participants	Percentage
1	-	
2	1	2%
3	10	22%
4	12	26%
5	14	31%
6	8	17%
7	-	



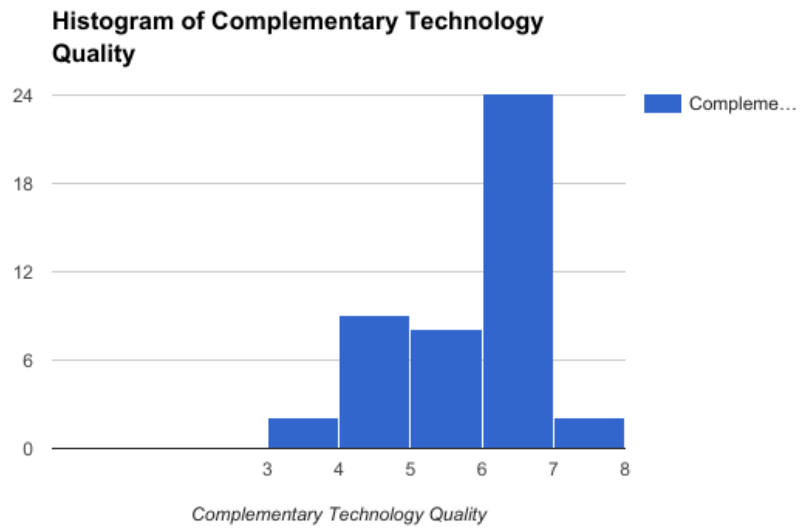
Mixed results when it came to the perceived net benefits. Most student are at a split decision when it comes to how useful Moodle is and if it really increases school productivity. This should never be the case because if Moodle is working effectively students will recognize and appreciate the value and usefulness of Moodle.

Computer Self Efficacy Measure		
Strongly Agree- Strongly Disagree	Number of Participants	Percentage
1	-	
2	1	2%
3	5	11%
4	13	28%
5	11	24%
6	13	28%
7	2	4%

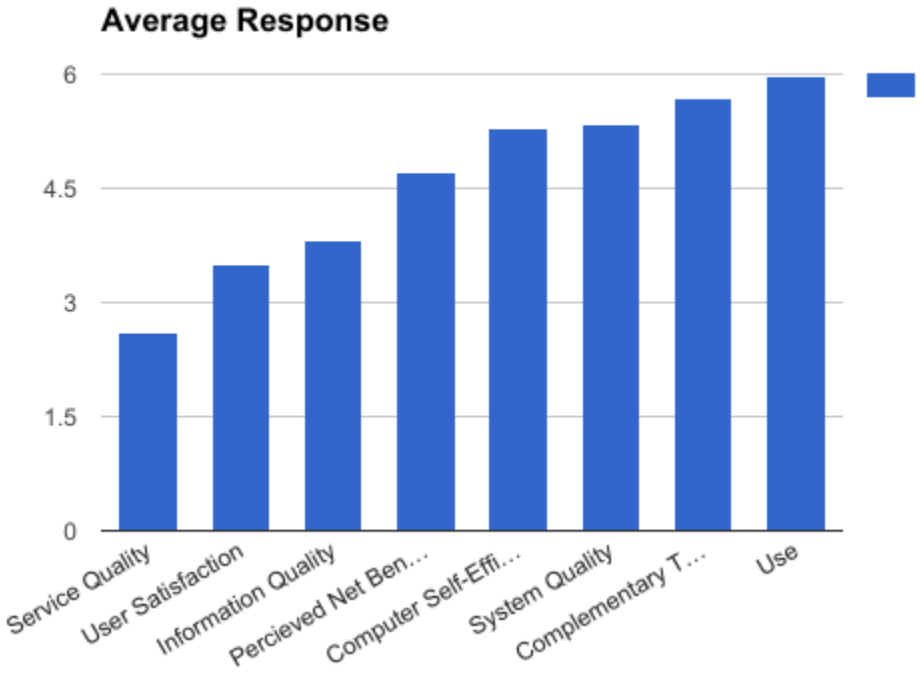


Most students believe that they are very self-proficient when it comes with dealing with computers. They can use Moodle without any assistance and they are able to understand how to use it.

Complementary Technology Quality		
Strongly Agree- Strongly Disagree	Number of Participants	Percentage
1	-	-
2	-	-
3	2	4%
4	9	20%
5	8	17%
6	24	53%
7	2	4%



Most students believe that they have the necessary devices needed to access Moodle as well as the internet speed.



Response average demonstrates that most students are split with the Moodle services but with a few improvement in certain areas can drastically change the entire perception on Moodle.

Discussion and implications, limitations, and future research

Implications

The research has been based upon gathering information to show how successful Moodle is and how to improve services at the university. Moodle is a well-developed E-learning software used to help improve and enhance the effectiveness and efficiency at school. The results displayed shows how Information Quality, Service Quality, System Quality, Use, User Satisfaction, Perceived Net Benefits, Computer Self Efficacy Measures, and Complementary Technology Quality are important to quantify the success level for Moodle. Based on the results construct if you want to improve the user satisfaction it starts with the information quality. This construct is directly based on how sufficient the information is on Moodle and if the information is updated regularly. Being that information quality is so low it explains why students aren't satisfied. Overall the results do demonstrate a lot of the failures of Moodle but with improvement in the area such as Information Quality can change that.

Limitations

Major limitations that were faced were mainly the sample size. Being that the there is such a large number of school students attending the university we had to limit the participants to a small amount which may not be a true indication of the results we are looking for. Secondly the project of this demand we lacked the necessary human resources to gather as well as process information.

Recommendation

To improve the Moodle software and help to increase user satisfaction and perceived net benefits the main constructs that Needs to be attended to are Information Quality and Service Quality. Information quality is based solely upon the teachers having posted all the required notes and information needed to be access by the students. Service Quality could improve by having the support staff constantly updating the software and progressing it and also being able to respond quickly to any service problems the user may have.

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Appendix:

Construct	Survey Questions
Information Quality	IQ1: Moodle provides information that is exactly what you need. IQ2: Moodle provides information you need at the right time. IQ3: Moodle provide information that is relevant to your academic curriculum. IQ4: Moodle provides sufficient information. IQ5: Moodle provides information that is easy to understand.IQ6: Moodle provides up-to-date Information
System Quality	SQ1: Moodle is easy to use. SQ2: Moodle is user-friendly. SQ3: Moodle provides high-speed information access. SQ4: Moodle provide interactive features between users and system.
Service Quality	SV1: The support staff keep Moodle software up to date. SV2: The users have a problem, Moodle's support staff show a sincere interest in solving it. SV3: Moodle support staff respond promptly when users have a problem. SV4: Moodle support staff tell users exactly when services will be performed.
User Satisfaction	US1: Moodle has met your expectations. US2: I am satisfied with Moodle. US3: Most students bring a positive attitude or evaluation towards Moodle.
Use	U1: The frequency of use with the e-HRM system is high. U2: You depend upon the e-HRM system. U3: I was able to complete a task using the e-HRM even if there was no one around to tell me what to do as I go. U4: I have the knowledge necessary to use the e-HRM.

Perceived Net Benefits	NB1: The e-HRM system helps you improve your job performance. NB2: The e-HRM system helps the organization save cost. NB3: The e-HRM system helps the organization achieve its goal. NB4: Using The e-HRM improves the assessment and training
Computer Self-Efficacy Measure	CSE1: I can use Moodle if there was no one around to tell me what to do as I go. CSE2: I could use Moodle if I had seen someone else using it before trying it yourself. CSE3: I could you use Moodle if I had have never used something like it before. CSE4: I could call someone for help if I got stuck. CSE5: I could use Moodle if someone showed me first. CEM6: I could use Moodle if someone else helped me get it started
Complementary Technology Quality	CTQ1: The software is adequate on the device (desktop computer, laptop, mobile device) used to access the Moodle. CTQ2: The device (desktop computer, laptop, mobile device) used to access Moodle have adequate internet connection in regards to speed and reliability. CTQ3: The device hardware (desktop computer, laptop, mobile device) used to access Moodle is adequate.

Questionnaire I – "The Success of Moodle at UB Belize City" (Students)

Purpose

This questionnaire asks for information about yourself and how often you use Moodle. We would like to measure how useful Moodle is to students and if students are satisfied with using it. Your individual responses to the questionnaire will be strictly confidential.

Instructions

This is a survey, not a test; there are no right or wrong answers. Please print in the spaces provided and tick the boxes to mark your answers.

1. Background Information	Answers:
Please enter your age:	17-19☐ 20-22☐ 23-24☐ >25☐
Please indicate the number of years you have been enrolled in this university:	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
Please indicate your gender:	Male ☐ Female ☐
Please indicate if you are an associates or bachelors student:	Associates ☐ Bachelors ☐

Indicate your agreement with each statement by rating it from (1) strongly disagree to (7) strongly agree.

2. Information Quality	Disagree ----------Agree
Moodle provides information that is exactly what you need.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
Moodle provides information you need at the right time.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
Moodle provide information that is relevant to your academic curriculum.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
Moodle provides sufficient information.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
Moodle provides information that is easy to understand.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
Moodle provides up-to-date Information.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
3. System Quality	**Disagree ----------Agree**
Moodle is easy to use.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
Moodle is user-friendly.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
Moodle provides high-speed information access.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
Moodle provide interactive features between users and system.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

4. Service Quality	Disagree ----------Agree
The support staff keep Moodle software up to date.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
The users have a problem, Moodle's support staff show a sincere interest in solving it.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
Moodle support staff respond promptly when users have a problem.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
Moodle support staff tell users exactly when services will be performed.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

5. User Satisfaction	Disagree ----------Agree
Moodle has met your expectations.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
I am satisfied with Moodle.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
Most students bring a positive attitude or evaluation towards Moodle.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐

6. Use	Disagree ----------Agree
I use Moodle frequently.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
I depend on Moodle.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
I have the knowledge necessary to use Moodle.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐

7. Perceived Net Benefits	Disagree ----------Agree
Moodle helps to improve your school performance.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
Moodle helps increase school productivity.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
Moodle helps you to achieve school goals you set for yourself.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐

8. Computer Self-Efficacy Measure	Disagree ----------Agree
I can use Moodle if there was no one around to tell me what to do as I go.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
I could use Moodle if I had seen someone else using it before trying it yourself.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
I could you use Moodle if I had have never used something like it before.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
I could call someone for help if I got stuck	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
I could use Moodle if someone showed me first	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
I could use Moodle if someone else helped me get it started	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐

9. Complementary Technology Quality	Disagree ----------Agree
The software is adequate on the device (desktop computer, laptop, mobile device) used to access the Moodle.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
The device (desktop computer, laptop, mobile device) used to access Moodle have adequate internet connection in regards to speed and reliability.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
The device hardware (desktop computer, laptop, mobile device) used to access Moodle is adequate.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐

Please return this survey to the person who gave you the form.