

Short Paper

Exploring Students' Adoption of Canvas Learning Management System in Programming at a State University in the Philippines: A Technology Acceptance Perspective

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Abstract

Purpose – Learning management systems (LMSs) became more prominent during the Coronavirus Disease 2019 (COVID-19) pandemic. Universities around the globe find the best solutions and which LMS is the best to deliver their education. This study determined the technology acceptance of using Canvas LMS Free for Teachers in delivering a programming course.

Method – A descriptive survey method was implemented in this study on the students of Bulacan State University, a state university in the Philippines, who are taking Bachelor of Science in Information Technology (BSIT). Web Systems and Technologies 2 course was subjected to using Canvas LMS and was evaluated by the students.

Results – Within the course, lessons in the form of modules were provided. Additionally, summative assessments were provided to the students at the end of each lesson. Third-year BSIT students were asked to evaluate the LMS used. Out of 169 students enrolled in the course, 132 students answered the survey questionnaire provided. Upon tabulating students' responses, it was deemed found that they "Strongly Agree" with using Canvas LMS. In terms of its technicalities, the overall mean is $M=4.52$, which shows that Canvas LMS offers quality features fit for use in delivering programming courses. On the other



hand, in terms of its presence, the overall mean is $M=4.50$, which shows that by using the LMS, students were able to learn the programming language being delivered asynchronously.

Conclusion – The results show that Canvas LMS is one of the better options for delivering programming courses through asynchronous modalities.

Recommendations – Other programming courses being offered in the university may utilize the same LMS. Additionally, with high results of acceptance, the university may consider a subscription to Canvas LMS to deliver its courses online.

Research Implications – As the study's findings highlighted the high acceptance of students on using Canvas LMS, this presents that utilizing a learning management system in programming is an effective approach as it offers features for programming courses.

Keywords – learning management systems, online learning, information technology, programming, asynchronous learning

INTRODUCTION

The global spread of the Coronavirus Disease 2019 (COVID-19) pandemic started in December 2019. Due to its impact, companies, offices, and even schools and universities had to close and find other means to communicate with their students (Khalil et al., 2020). Transitioning from traditional face-to-face classes to online distance learning was difficult for schools and universities (Mpungose, 2020; Turnbull et al., 2021).

The pandemic did not spare the Republic of the Philippines from its spread. The government discovered a means to deliver education despite the pandemic by imposing several learning modalities to respond to the global concern about education (CMO No. 4, s. 2020, 2020). Bulacan State University, one of the Philippines' state universities, created guidelines that complemented the government's response. Bulacan State University (BuSU) is a cutting-edge academic university situated in the Philippine province of Bulacan, in the City of Malolos. BuSU created rules for utilizing flexible learning modalities as part of its attempts to provide education to its students (Bulacan State University [BuSU], 2020). During this pandemic, BuSU employed three learning modalities: synchronous learning (SL), asynchronous online learning (AOL), and remote print learning (RPL). These instructional strategies were put in place to meet the various needs of the students.

Web Systems and Technologies 2, one of the courses at Bulacan State University, College of Information and Communications Technology (CICT), was delivered using the Canvas Learning Management System (LMS) Free for Teachers. This course was delivered

asynchronously using the said LMS, with faculty intervention through synchronous sessions for questions and clarifications.

As Eusoff et al. (2022) noted in their study, it can be difficult for educators to deliver programming courses online because they have fewer interactions with the students. Additionally, educators are unsure of whether the students fully grasp the course of programming because programming is a challenging course to learn. As such, CICT indeed had a similar worry when teaching programming during this pandemic era.

As one of the solutions for delivering online classes in higher education, utilizing learning management systems should be evaluated on how its stakeholders will accept this technology. Technology acceptance, as one of the acceptance models, helps to determine the user's attitudes toward utilizing an LMS with their perceived usefulness and perceived ease of use. The higher the acceptance of the users of the technology, the more the technology should be utilized.

The study's main objective is to determine the technology acceptance of students in using the Canvas Learning Management System (LMS) Free for Teachers in learning a programming course delivered at Bulacan State University. Specifically, this study answered the following questions: (1) How may the students perceive technology acceptance of Canvas LMS in terms of its technicalities? (2) How may the students perceive technology acceptance of Canvas LMS in terms of its presence?

LITERATURE REVIEW

As higher education institutions shift from traditional face-to-face classes to online learning because of the COVID-19 pandemic, several studies have highlighted how universities handled this situation by implementing online learning. Abdulkareem and Eidan (2020), Ali (2020), Coman et al. (2020), Dela Rosa (2023), Simamora et al. (2020), and Laili and Nashir (2021) studied the effects of the pandemic on higher education institutions, highlighting how universities could adapt to continue delivering education through online learning. These studies mentioned the advantages of online learning amidst the pandemic. Moreover, they have found that within the situation, online learning became the only resort to continue delivering education to its people.

LMSs, even before the pandemic, were already used by other universities across the globe and even across the Philippines to implement online distance learning. Studies by Dobre (2015), Aldiab et al. (2019), Ghilay (2019), and Reid (2019) have presented the advantages and benefits of using LMSs in delivering education in higher education institutions. Each study showed what universities could benefit from using an LMS even during the era of traditional, face-to-face classes.

With the high rise of LMSs in higher education, identifying the technology acceptance of its stakeholders is a must. The technology acceptance model by Davis (1986)

provides insights into different factors which may influence the attitudes and intentions of users when using and adopting a particular technology.

The researcher focused on students' technology acceptance of using the Canvas LMS used during the delivery of a programming course. The students evaluated the LMS in two different aspects, the LMS's technicalities and presence.

METHODOLOGY

Research Design

The study utilized descriptive survey research. According to Fraenkel and Wallen (2019), descriptive survey research is utilized to describe the opinions, characteristics, behaviors, and attitudes of a population by collecting data from a set of individuals. Additionally, Creswell and Creswell (2014) noted that this methodology is useful when gathering data from a specific group or situation. This research design was utilized in the study to describe the students' perspectives on using Canvas LMS throughout a semester in one of their programming courses.

Research Instrument

This study's primary source was adapted from the rubric for evaluating e-learning tools by Anstey and Watson (2018). This rubric is intended to review and assess e-learning tools being used among learners in higher education institutions. Then, it was made to be a survey questionnaire and was validated by the teaching and learning technologies experts of BuSU. The survey questionnaire consisted of criteria from the rubric of Anstey and Watson (2018) with 15 items under technicalities and nine (9) items under presence. Technicalities were categorized into functionality, accessibility, technology, privacy, data protection, and rights which were focused on the technical aspects of utilizing the LMS. Presence was categorized into social, teaching, and cognitive which were focused on determining how the LMS can provide support, ease of use, and facilitates higher order thinking skills.

Data Gathering Procedure

The survey questionnaire was provided at the end of the course, which marks the beginning of the data collection. Students were guided on answering questions from the survey should they have any concerns regarding the content of the questionnaire via a synchronous session.

Population and Sample

The Bachelor of Science in Information Technology (BSIT) third-year students who took the course Web Systems and Technologies 2 are involved in this study. These students were targeted as respondents since one of their programming courses utilized the Canvas LMS to deliver their classes. Since the study is focused on a programming course, only BSIT students in their third-year level were involved since they were enrolled in the said course. The population of students who used Canvas LMS Free for Teachers is 169. The computed sample size is 118.80 or 119 students, with a 5% margin of error. The number of students who responded is 132 and is within the calculated sample size.

Statistical Treatment

The study's interpretation was based on a five-point Likert scale. "Strongly Agree" has a numerical equivalent of five (5) and a range of 4.50-5.00. "Agree" has a numerical equivalent of four (4) and a range of 3.50-4.49. "Neutral" has a numerical equivalent of three (3) and ranges from 2.50 to 3.49. "Disagree" has a numerical equivalent of two (2) and a range of 1.50-2.49. Lastly, "Strongly Disagree" has a numerical equivalent of one (1) and a range of 1.00-1.49. Using the given scale, the mean of student responses was computed and presented with its equivalent descriptive interpretation.

RESULTS

Technology Acceptance of Students on Using Canvas LMS in Terms of Technicalities

The instrument evaluates Canvas LMS in terms of its technicalities with the following criteria: (1) Functionality; (2) Accessibility; (3) Technology; and (4) Privacy, Data Protection, and Rights. Table 1 presents the summary of the evaluated criteria in determining the students' technology acceptance of using Canvas LMS in terms of its technicalities.

Table 1. Summary of the Respondents' Ratings in Evaluating Canvas LMS in Terms of its Technicalities

Item	Mean	Descriptive Interpretation
Functionality	4.46	Agree
Accessibility	4.53	Strongly Agree
Technology	4.56	Strongly Agree
Privacy, Data Protection, and Rights	4.54	Strongly Agree
Total	4.56	Strongly Agree

Technology Acceptance of Students on Using Canvas LMS in Terms of Presence

The instrument evaluates Canvas LMS in terms of its presence with the following criteria: (1) Social Presence, (2) Teaching Presence, and (3) Cognitive Presence. Table 2 presents the summary of the evaluated criteria in determining the students' technology acceptance of using Canvas LMS in terms of its presence.

Table 2. Summary of the Respondents' Ratings in Evaluating Canvas LMS in Terms of its Presence

Item	Mean	Descriptive Interpretation
Social Presence	4.49	Agree
Teaching Presence	4.52	Strongly Agree
Cognitive Presence	4.49	Agree
Total	4.50	Strongly Agree

DISCUSSION

In terms of Canvas LMS Free for Teachers technicalities, the students have rated technology the highest with a mean of $M=4.56$. This rating shows that Canvas LMS is an emerging technology in learning their programming course as it delivers content well with proper structuring, allowing students to easily identify programming codes and the like. Additionally, students have rated privacy, data protection, and rights with a mean of $M=4.54$, showing that students feel safe online while using the LMS. However, students have rated accessibility the lowest with a mean of $M=4.46$. Students feel that the LMS should offer a stronger support platform and allow them to communicate through different media channels such as audio, visual, and textual.

On the other hand, in terms of the LMS's presence, students have rated teaching presence the highest, with a mean of $M=4.52$, which shows that Canvas LMS enables students to learn course contents asynchronously, with minimal interaction with their instructor. Moreover, students have rated both cognitive and social presence with a mean of $M=4.49$, which shows that Canvas LMS enables students to communicate with their instructors through synchronous sessions and chats. In addition, Canvas LMS also allows students to work collaboratively with each other within the LMS. Lastly, Canvas LMS provides assessment tools where students can enhance learning with different options, such as taking quizzes and submitting assignments to their instructor.

CONCLUSIONS AND RECOMMENDATIONS

After the data had been analyzed and interpreted, this study found that students strongly agreed with using Canvas LMS in learning a programming course. With this, Canvas LMS has been deemed to positively impact students' learning as a tool in delivering

a programming course. In addition to this, it was also found that: (1) Canvas LMS emerged to be a solution for delivering programming courses with technicalities that fit the need of a programming course; and (2) Canvas LMS has an excellent social, teaching, and cognitive presence that students found helpful in learning a programming course asynchronously.

Based on the findings and conclusions, this study presents the following recommendations: (1) Consider using Canvas LMS for future programming courses the university offers. Using Canvas LMS to offer lecture courses may also be considered, and (2) The university may consider buying a subscription with Canvas LMS to enable even the administration panel to be accessed to manage Canvas courses within the university easily.

RESEARCH IMPLICATIONS

With the study's findings, it was highlighted that in terms of technicalities and presence of using the Canvas Learning Management System Free for Teachers was highly accepted by the target respondents. As such, other universities may consider using the same LMS that offers free access to deliver programming courses online or may subscribe to it to have access to administrative features of the LMS.

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DECLARATIONS

Conflict of Interest

The author declares no conflict of interest.

Informed Consent

All participants of the study were informed of the purpose and data to be collected upon answering the survey questionnaire. The identity of the respondents was not obtained during the data gathering.

Ethics Approval

The BulSU Research Management Office and Research Ethics Committee accepted and approved the conduct of the study.

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