Journal of Information Systems Engineering and Management
2025, 10(6s)
e-ISSN: 2468-4376
https://www.jisem-journal.com/

Research Article

An Examination of Virtual Learning Platform (VLP) Usage, Engagement Factors, and Effectiveness in Education: An Analysis Using the Delone and Mclean Model

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ARTICLE INFO

Received: 05 Oct 2024

Revised: 05 Dec 2024

Accepted: 22 Dec 2024

ABSTRACT

The current educational landscape integrates learning management systems (LMS) to cater to the needs and demands of the digital and virtual era. Central Bicol State University of Agriculture's LMS, the Virtual Learning Portal (VLP) is implemented to teach and learn, offering flexible and accessible avenues for students and instructors. This research explores the utilization, engagement factors, and effectiveness of VLPs within educational settings. Employing the updated DeLone and Mclean Model as a guiding framework, the study delves into the multifaceted dimensions of VLP usage, scrutinizing the frequency and patterns of engagement among students and instructors alike. Additionally, the research aims to assess the perceived effectiveness of Learning Management Systems (LMS) incorporated within VLPs. The researcher utilized online surveys and data mining techniques to gather information from a sample of LMS users, comprising students and faculty members. The information collected is then evaluated using statistical techniques to assess the correlations between the various parameters and ascertain their impact on LMS success. The results showed that system information and service quality influence user satisfaction and behavioral intention to utilize the LMS. Further evidence that a great LMS experience enhances learning outcomes is the positive correlation between user happiness and learning effectiveness. The implications of this research highlighted the importance of prioritizing system quality, information quality, and service quality in LMS design and implementation. It focuses on the significance of ongoing evaluation and enhancement of these elements to guarantee a satisfying user experience and increased learning efficacy. The results also show that user happiness is a critical factor in determining how well an LMS performs, indicating the necessity of a user-centered design and individualized learning strategies within the LMS. This research contributes to the existing body of knowledge by providing insights into evaluating LMS success using the updated DeLone and McLean model.

Keywords: virtual learning portal, engagement factors, delone and mclean model, learning management system

INTRODUCTION

The way learning experiences are handled and provided in educational settings, and corporate training environments is revolutionized by the growing use of learning management systems (LMS). These digital platforms offer various tools and features that facilitate content delivery, learner engagement, and assessment for online courses. Educational institutions and enterprises must measure the ROI of their investments in LMSs to boost learning outcomes and the overall learning experience.

The DeLone and McLean Information Systems Effectiveness Model, widely used as a framework for gauging the effectiveness of information systems, including LMS, was first developed in 1992 and then modified in 2003. Given the rapid growth of technology and the changing educational scene, the model urgently needs to be updated to represent the distinctive qualities and complexity of contemporary LMS platforms.

This study aims to update the DeLone and McLean model and modify it to reflect better how successful CBSUA's LMS - the CBSUA Virtual Learning Portal - is. This study seeks to provide a comprehensive and reliable framework for assessing the effectiveness of LMS platforms by including pertinent characteristics and features that reflect the state of LMS technology and current educational practices.

This study is significant because it can improve decision-making procedures, increase instructional strategies, and direct future LMS platform investments. This research will likewise, assist educational institutions and companies make wise decisions based on precise and thorough evaluations of LMS effectiveness by giving decision-makers a revised model. Educators and trainers can also enhance instructional tactics, customize LMS usage to learners' needs, and ultimately improve learning outcomes by being aware of the elements that lead to LMS success.

To attain the objectives of this research, the descriptive-correlational method and data mining techniques were applied. Descriptive methods were used to collect data concerning the attributes that most influence the students' interest in operating an e-learning environment. Data mining techniques were also utilized to extract valuable insights and patterns from the vast data generated by system logs. The study applied the Updated DeLone and Mclean Information System (IS) Success Model modified to adequately explain the precursors of online learning management systems (LMS) usage and provide essential guidelines for academic institutions when designing and implementing such systems.

The main goals of the study are; (1) determine the respondent's frequency of using VLP. (2) determine factors that affect students' and instructors' engagement in the VLP. (3) measure the effectiveness of the Learning Management System (LMS) - VLP using the DeLone and McLean Mode. (4) and determine whether the respondent's frequency of using VLP is significantly associated with the type of respondents, perceived factors, and perceived effectiveness of the Learning Management System (LMS) – VLP.

In conclusion, the study examined the need for an enhanced evaluation framework that aligns with the changing LMS technological landscape. It does this by analyzing the effectiveness of LMS using the revised DeLone and McLean Model. In like manner, using the descriptive-correlational method and an updated model, this research aims to offer insightful information about the success factors for LMS, ultimately assisting educational institutions and organizations in making decisions, improving teaching and learning procedures, and maximizing the overall learning experience.

METHODOLOGY

This study utilized a descriptive correlational research design. The respondents are students and teachers who utilized CBSUA-VLP. To identify the sample, this study used Yamene's Formula at a 5% level of significance and the respondents were randomly selected from the populations. Moreover, this study used survey questionnaires and system logs as instruments for gathering data. To ensure the validity of the gathered data, the instrument was subjected to content and construct validation. The content validity of the instrument was ensured through the help of experts such as Prof. Dennis C. Gabon, Dean College of Information Technology, Mr. Jake M. Labrador and Mr. John Walter C. Cabaltea, Programmers, University Management Information System (UMIS) and the construct validity was ensured through convergent validity.

Furthermore, the instrument was subjected likewise to a reliability test with the use of Cronbach's Alpha with the Alpha value of 0.961 and 0.986 for effectiveness and factors, respectively. The given Alpha value suggested that there is an internal consistency with the gathered data, hence, the reliability of the instrument was ensured.

Respondents of the Study

The study utilized representative samples from the students of CBSUA-Sipocot across programs and from the faculty of the campus. The distribution of the respondents was selected using Yamane's formula, obtaining 1,125 student and 101 faculty respondents.

Research Instrument

This study was primarily conducted at the Central Bicol State University of Agriculture-Sipocot located at Zone 5 Impig, Sipocot, Camarines Sur.

The researchers attempted to include other SUCs in the research scope through a letter of permission to conduct the study at their respective schools. Campus visitation was even done but due to being bound by the Data Privacy Act, the schools denied permission to extract and share data from their own LMS because they deemed these data sensitive. Other schools that were sent the same letter of request did not respond despite incessant requests from the researchers.

Statistical Treatment

This study used the Statistical Package for Social Science (SPSS) version 27.0 software to analyze data with the help of the following statistical tools: *frequency count and percentage*, *weighted mean and ranking* techniques, and *ordinal logistic regression*.

Frequency Counts and percentages were used to determine the frequency of utilization of the student and instructor users.

Weighted Mean and Ranking techniques were used to determine the factors affecting the VLP engagement of faculty and students.

Ordinal logistic regression was used to determine whether the respondent's frequency of using VLP is significantly associated with the type of respondents, perceived factors, and perceived effectiveness of the VLP.

LITERATURE REVIEW

With the present demand for integrating tools of technology in the educational arena, academic institutions have been striving to develop learning management systems that would facilitate authentic and relevant educational experiences for the faculty and students. The foregoing literature and studies provided insights and an in-depth understanding of the concepts of learning management systems and other relevant topics related thereto.

Measuring the Success of LMS Implementation

Learning management systems (LMS) are becoming essential elements of training environments in both academic institutions and businesses. These digital platforms make the delivery, management, and tracking of numerous learning activities possible. Understanding how an LMS performs regarding learning outcomes, user satisfaction, and overall business objectives is essential. DeLone and McLean's Information Systems Success Model has been frequently employed to evaluate the effectiveness of information systems, particularly LMS. However, an updated version of the model is required to appropriately assess the performance of current LMS systems due to changes in the educational landscape and technological improvements.

The research conducted by [1] utilizes DeLone and McLean's Information Systems Success (D&M ISS) model with modifications to examine the factors influencing the acceptance of Canvas, an e-learning system, among students at a Nigerian University. This study addresses the need for more research on adopting e-learning in developing countries, specifically focusing on using e-learning systems and the quality attributes of the investigated software.

[2] Confirms the applicability of the DeLone and McLean information system success model in the context of hospital information systems within a developing country. The study highlights the significance of system quality and usage as crucial indicators of the success of hospital information systems. Consequently, it is crucial to design hospital information systems that are user-friendly, flexible, and function effectively to fulfill their intended purposes.

The study of [3] proposes an evaluation model for Learning Management Systems (LMS) in Sub-Saharan higher education institutions. By adopting and expanding the DeLone and McLean model, the study found that course quality positively influences learners' satisfaction and LMS usage, supporting previous research. Instructors should create high-quality course content that aligns with educational objectives and learner characteristics to maximize LMS usage and satisfaction. Additionally, service quality positively affects LMS usage, emphasizing the importance of comprehensive support services, especially for learners with limited exposure to ICT solutions. System quality also positively impacts LMS usage, highlighting the need for user-friendly and easily learnable LMS platforms.

Using a modified DeLone and McLean model, the study of [4] demonstrates significant results in LMS applications. Additionally, it equips higher education institutions with credible, trustworthy, and comprehensive models and procedures for assessing the LMS's success. It is feasible to design applications with similar qualities

based on the study's findings regarding the link between factors. Additionally, the study can assist educational institutions in identifying system characteristics such as ease of use, system reliability, personalization, and integration between system components that should be improved to make the system more reliable, user-friendly, personal, attractive, intuitive, and simple to navigate. These factors should contribute to the system's perceived usefulness and enjoyment. A periodic assessment using this modified model should be conducted to evaluate the fitness of LMS with the user needs. Once it is unsuitable a development based on the gaps should be performed.

The study of [5] introduces an extended version of the widely recognized DeLone and McLean's Information Systems Success (D&M ISS) model to evaluate and validate the success factors of the Shaqra University platform. The findings indicate that this study's chosen instrument was valid and reliable. Additionally, the results demonstrate that the model aligns well with the Saudi context. The proposed factors, namely instructor's quality, learner quality, and perceived usefulness, positively influenced the e-learning platform. However, the aspects of information quality, system quality, and service quality did not positively impact the utilization of the e-learning platform.

In their research, [6] focused on Learning Management Systems (LMSs), which offer learners various resources like videos, quizzes, and forum discussions to support their learning. However, merely having access to an LMS does not guarantee effective learning. The effectiveness of LMS usage in facilitating learning is a topic of interest for course providers, LMS vendors, and learners. To address this, the study employed the updated DeLone and McLean information system success model to investigate the impact of LMS system quality, information quality, and service quality on learners' system use, user satisfaction, and learning effectiveness. The results indicated that system and service quality, but not information quality, were significantly related to system use. Furthermore, system use was found to have a significant relationship with learning effectiveness.

The study conducted by [7] aimed to evaluate the satisfaction level and benefits of using the m-Banking system in the banking sector. The researchers employed the IS Success Model developed by DeLone and McLean in 2003 to assess the system's impact. The findings revealed that the IS Success Model, encompassing system, information, and service quality, significantly influenced customer satisfaction in utilizing BCA m-Banking. These results further validate the research conducted by DeLone and McLean (2003) in establishing the IS Success Model as a reliable measure of information system quality and a key driver of success.

[8] conducted a study to examine the factors influencing user satisfaction and net benefits of a mobile Learning Management System (LMS) for cyber university students in the hospitality industry. They utilized the quality factors from the updated DeLone and McLean information system success model. Additionally, the study aimed to determine whether there are differences in perception depending on self-directed learning (SDL). The findings revealed that information quality, system quality, and service quality positively influenced user satisfaction, which, in turn, had a positive impact on net benefits. The analysis also indicated that all paths were significant for high SDL groups, but for low SDL groups, the path between information quality and user satisfaction did not show statistical support. These results emphasize the need for a differentiated strategy based on SDL levels to enhance user satisfaction and maximize the net benefit of the mobile LMS. The findings have practical implications for ensuring the stable operation of mobile LMSs in cyber universities.

[9] introduces an updated Delone and McLean information systems success (D&M ISS) model by incorporating external factors. This extended model includes additional constructs such as student capability, teacher capability, and social influence. The study highlights the significance of improving the system's quality, information quality, teacher's capability, student's capability, and social impact in enhancing user satisfaction. Furthermore, the study reveals a reciprocal relationship between student satisfaction and net academic benefit. To optimize the e-learning system, it is crucial to focus on enhancing the system's quality, student satisfaction, information quality, service quality, and both student and teacher capability, as these factors do not directly influence the use of e-learning. The findings of this study have both theoretical and practical implications, providing valuable insights for regulators and researchers in evaluating the success of e-learning initiatives.

[10] explore the impact of a learning management system (LMS) on student satisfaction and performance and its potential to enhance the branding of a university. The study adopts the DeLone and McLean theory to assess the success of the LMS in improving university branding through the satisfaction and performance of students using the LMS. The findings reveal that the LMS significantly strengthens university branding by enhancing student satisfaction and performance. By embracing digitalization and utilizing the LMS, higher education institutions can

meet the expectations of students as important stakeholders, leading to a more effective teaching and learning process. The empirical results of this study provide valuable insights for developing LMS systems as part of the digital branding of universities, which can serve as a source of competitive advantage.

RESULTS AND DISCUSSION

This part presented the gathered data, the statistical analysis result, and the interpretation of the findings. These are presented in tables following the sequence of the specific research problems.

Objective 1. Determining the Respondents' Frequency of VLP Utilization

Table 1 shows the frequency of VLP utilization by the respondents. Based on the log report of faculty and student users, the data below presents the number of users on the specifically indicated frequency of utilization.

Table 1

Respondents Frequency of VLP Utilization

Frequency of Utilization	Respondents				Total	
	Students		Faculty			
	Frequency	Percent	Frequency	Percent	Frequency	Percent
3 or more times a day	151	13.48	10	19.23	161	13.74
1-2 times a day	150	13.39	7	13.46	157	13.40
Thrice a week	144	12.86	9	17.31	153	13.05
Twice a week	169	15.09	9	17.31	178	15.19
Once a week	506	45.18	17	32.69	523	44.62
Total	1120	100.00	52	100.0	1172	100.00

The table presents data on the frequency of Virtual Learning Portal (VLP) utilization among students and faculty members. It outlines different usage patterns, from "3 or more times a day" to "Once a week," and provides counts and percentages for each category.

The majority of both students and faculty members used the VLP "Once a week," with 45.18% of students and 32.69% of faculty members falling into this category. Students represent a larger portion of respondents compared to faculty members, with 1120 students and 52 faculty members.

Objective 2. Determining the Factors that affect Instructors and Students' Engagement in the VLP along Psychological /Environmental and Technology Use/User Capability/Ease of Access Related Factors

Table 2 discloses the psychological /environmental-related factors that affect VLP engagement of faculty and students. The table presents indicators reflecting various psychological and environmental factors influencing engagement with the Virtual Learning Portal (VLP). Both students and faculty members respond, reflecting their perceptions of these factors.

Overall mean values indicate the average level of agreement or disagreement, with higher means indicating stronger agreement with the statements. The "Int." column likely indicates agreement with the statement.

Table 2

Psychological /Environmental-related Factors that Affect Instructor and Student Engagement in the VLP

Indicators	Students	Faculty	Overall Mean	Int.	Rank
1. I harbor a negative attitude towards the VLP basically because it is a thing for me	2.50	2.67	2.59	A	15
2. The limited student-student and teacher-student relationship because of remote	2.92	3.12	3.02	A	7

learning leads to a higher level of discomfort among peers and teachers.					
3. Because of minimal physical interactions between students and teachers, VLP leaves me with a feeling of isolation, anxiety, stress frustration, and depression.	2.80	2.98	2.89	A	14
4. The chronically stressful environment may decrease my level of aptitude.	2.95	3.06	3.01	A	10
5. When stressed and challenged, I tend to zone out of the task and procrastinate.	3.04	2.94	2.99	A	11
6. When stressed and under pressure, I have the tendency to thrive, act out on tasks, and be productive.	2.96	2.94	2.95	A	13
7. My parents and siblings have been providing minimal help since they are also struggling with the newness of online education.	3.00	3.02	3.01	A	8
8. With minimal help, supervision, and interaction, I am less motivated and lack the drive to achieve my learning/teaching goals.	2.89	3.02	2.95	A	12
9. Due to the lack of face-to-face communication between peers, students, and teachers in an online setting, the students might find that they are unable to work effectively in a team setting.	3.11	3.15	3.13	A	4
10. Without face-to-face communication and physical classrooms as workshops, practical skills are less developed.	3.30	3.35	3.33	A	1
11. It also allows schools to reach out to a more extensive network of students, instead of being restricted by geographical boundaries.	3.08	3.15	3.12	A	5
12. The resulting increase in screen time in online learning may be a health hazard such as bad posture and other physical problems due to staying hunched in front of a screen.	3.29	3.29	3.29	A	2
13. Though VLP is accessible to the students, I find it difficult to access some of the lessons since the kind of mobile phone that I own does not support some of the features of the VLP.	3.06	2.96	3.01	A	9
14. Not keeping up with tasks, due dates, and expectations due to intermittent data/internet connections stresses and depresses me.	3.21	3.06	3.13	A	3
15. It is stressful to note that even though I answered correctly during quizzes, the VLP marked it wrong.	3.12	3.00	3.06	A	6
Overall Mean	3.02	3.05	3.03		
Int	A	A	A		
Rank	2	1			

Legend: 4.20 – 5.00 – Strongly Agree (SA_

3. 40 – 4.19 – Moderately Agree (MA)

2.60 – 3.39 - Agree (A)

1.80 – 2.59 - Moderately Disagree (MD)

1.00 – 1.79 - Strongly Disagree (SD)

The "Rank" column ranks indicators based on overall mean values, highlighting significant concerns such as limited relationships, skills development, and screen time health hazards. Faculty members generally show slightly higher mean values, suggesting slightly stronger agreement with the statements compared to students.

Table 3

Technology Use/User Capability/Ease of Access-related factors that affect instructor and student engagement in the VLP

Indicators	Students	Faculty	Overall Mean	Int.	Rank
1. The VLP allows users to use any digital device to access the VLP at any time and from any location.	3.33	3.21	3.27	A	2
2. In the VLP, every category of courses and disciplines is structured.	3.38	3.23	3.30	A	1
3. All topics can be easily accessed from the various courses in the VLP, using easy-to-manipulate tabs and buttons.	3.27	3.13	3.20	A	5
4. Uploaded files can be quickly downloaded in the VLP.	3.19	3.10	3.14	A	6
5. VLP is interactive and I can directly respond to activities in the subject through the VLP.	3.21	3.04	3.12	A	7
6. My mobile phone alone can support all the tasks and outputs required of me.	2.99	2.88	2.94	A	14
7. Sometimes, outputs sent are lost and cannot be seen anymore when VLP is re-accessed.	3.26	2.98	3.12	A	8
8. The VLP can accommodate large files.	2.68	2.73	2.71	A	15
9. The VLP is user-friendly and is characterized by data security and retrieval features.	3.16	3.02	3.09	A	9
10. It is simple to upload and download files in the VLP if these files are only small files requiring low storage capacity.	3.29	3.13	3.21	A	4
11. In the VLP, uploading files is difficult not only for the reason of internet connection.]	3.23	2.92	3.07	A	10
12. In case of power or internet interruption, in case of time-restricted quizzes and tasks that allow one attempt only, I can no longer be allowed to have another attempt though the reason was beyond my control.	3.42	3.08	3.25	A	3
13. I experience difficulty in navigating all the parts and features of the VLP	3.03	2.90	2.97	A	12
14. In the VLP, I can customize accessibility settings and programs.	3.01	2.98	3.00	A	11
15. For my inquiries, help and support are available and response is quick.	2.99	2.92	2.96	A	13
Overall Mean	3.16	3.02	3.09		
Int	A	A	A		
Rank	1	2			

Table 3 reveals the technology use/user capability/ease of access-related factors that affect the VLP engagement of faculty and students.

Both students and faculty appreciate the Virtual Learning Platform (VLP) for its accessibility across various digital devices and its structured approach to courses and disciplines.

However, while users find it relatively easy to access content and download files, concerns arise regarding the loss of outputs and difficulties in navigating all VLP features. Students note limitations with mobile phone support for VLP tasks, and both groups acknowledge challenges with handling large files on the platform. Despite these concerns, users generally perceive the VLP as user-friendly, secure, and equipped with adequate help and support features.

However, there are notable concerns about difficulties in uploading files, especially during internet interruptions, and limitations related to time-restricted tasks and one-attempt quizzes.

Table 4 presents the summary table of the two indicated factors that affect engagement to the VLP of the instructor and student users.

Table 4

Summary table of the factors that affect Instructor and student engagement in the VLP

Mental Health	Students	Faculty	Overall Mean	Int.	Rank
Psychological /Environmental	3.02	3.05	3.03	A	2
Technology Use/User Capability/Ease of Access	3.16	3.02	3.09	A	1
Overall Mean	3.09	3.04	3.06		
Int	A	A	A		
Rank	1	2			

The summary table presents the factors influencing both instructor's and students' engagement in the Virtual Learning Platform (VLP), categorized into mental health and technology use/user capability/ease of access. While both groups perceive psychological/environmental factors as slightly lower than technology use/user capability/ease of access, indicating some areas of concern related to mental health and environmental factors, the overall mean scores for both categories are relatively close.

However, technology use/user capability/ease of access ranks higher in the overall mean and is considered the primary factor affecting engagement in the VLP. Both students and faculty members generally agree on the importance of these factors, highlighting the critical role of technology and accessibility in enhancing engagement with the VLP.

Objective 3. Determining the Effectiveness of Learning Management System (LMS) - VLP using the DeLone and McLean Model

Table 5 evaluates the effectiveness of the learning management system (LMS) using the DeLone and McLean Model, encompassing system quality, information quality, and service quality as indicators. Both students and faculty provide feedback on various aspects of the LMS.

In terms of system quality, users perceive the VLP interface as intuitive and reliable, with satisfactory technical performance and design, highlighting its positive influence on teaching and learning activities. Meanwhile, information quality is deemed high, with accurate, relevant, and well-organized learning materials that deepen understanding and meet academic needs.

Table 5
Effectiveness of Learning Management System (LMS) using the DeLone and McLean Model along with System Quality, Information Quality, and Service Quality

Statement Indicators	Students	Faculty	Overall Mean	Int.	Rank
System Quality					
1. The VLP interface is intuitive and easy to navigate for both faculty and students.	4.09	4.21	4.15	MA	1
2. The technical performance of the VLP (loading speed, responsiveness) meets my expectations.	3.81	4.00	3.91	MA	5
3. The features and tools offered by the VLP enhance the learning/teaching experience.	4.01	4.27	4.14	MA	2
4. The reliability of the VLP in terms of uptime and consistent functionality is satisfactory.	3.93	4.12	4.02	MA	4
5. Overall, the VLP design positively influences my teaching/learning activities	4.05	4.21	4.13	MA	3
Average	3.98	4.16	4.07	MA	
Information Quality					
1. The learning materials on the VLP are accurate and aligned with the course objectives.	4.24	4.38	4.31	SA	1
2. The content available on the VLP helps deepen my understanding of the subject matter.	4.13	4.35	4.24	SA	3
3. The resources accessible through the VLP are up-to-date and relevant to my studies/teaching.	4.15	4.33	4.24	SA	4
4. The variety and depth of information provided on the VLP contribute significantly to my academic/teaching needs.	4.14	4.35	4.24	SA	2
5. The organization and presentation of information on the VLP facilitate effective learning/teaching.	4.14	4.21	4.17	MA	5
Average	4.16	4.32	4.24	SA	
Service Quality					
1. Technical support for issues related to the VLP is readily available and responsive.	3.93	4.15	4.04	MA	4
2. Instructors/Faculty members are accessible and responsive to queries raised through the VLP.	3.97	4.15	4.06	MA	3
3. The guidance and assistance for utilizing the VLP functionalities are helpful and timely.	4.03	4.17	4.10	MA	2
4. Feedback on queries or concerns raised through the VLP is valuable and prompt.	3.98	4.04	4.01	MA	5
5. The overall support system surrounding the VLP positively impacts my teaching/learning experience.	4.06	4.17	4.12	MA	1
Average	3.99	4.14	4.06	MA	
Overall Mean (OM)	**4.13**	**---**		**MA**	

Legend: 4.20 – 5.00 – Strongly Agree (SA)

3. 40 – 4.19 – Moderately Agree (MA)

2.60 – 3.39 - Agree (A)

1.80 – 2.59 - Moderately Disagree (MD)

1.00 – 1.79 - Strongly Disagree (SD)

Furthermore, service quality, receives positive ratings, particularly in terms of technical support availability, instructor accessibility, guidance, and overall support system impact. Overall, the LMS demonstrates effectiveness across all the identified dimensions, with high averages indicating positive user experiences and the service quality category ranking highest overall.

Table 6

Effectiveness of Learning Management System (LMS) using the DeLone and McLean Model along with User Satisfaction and Learning Effectiveness

Statement Indicators	Students	Faculty	Overall Mean	Int.	Rank
User Satisfaction and Learning Effectiveness					
1. Overall, I am satisfied with the VLP as a platform for learning/teaching.	4.03	4.13	4.08	MA	3
2. The VLP meets my expectations regarding contributing to my academic/teaching goals.	3.97	4.21	4.09	MA	2
3. Using the VLP has positively impacted my teaching/learning experience.	4.02	4.17	4.10	MA	1
4. The VLP has significantly enhanced my effectiveness as a student/teacher.	4.00	4.06	4.03	MA	5
5. My learning outcomes/ teaching outcomes have improved since using this VLP.	4.00	4.08	4.04	MA	4
Average	4.01	4.13	4.07	MA	

Table 6 evaluates the user satisfaction and learning effectiveness regarding the Virtual Learning Portal (VLP), as perceived by both students and faculty members.

Overall, users express high levels of satisfaction with the VLP, which is seen as meeting or exceeding their expectations in contributing to academic and teaching goals. The platform is perceived to have a positive impact on teaching and learning experiences, with users reporting improvements in effectiveness as students or teachers. While there are slight variations in ratings across individual indicators, the average scores indicate a strong consensus regarding the platform's efficacy in enhancing learning and teaching outcomes, with faculty members generally showing slightly higher satisfaction levels compared to students.

Objective 3. Determining whether the respondent's frequency of using VLP is significantly associated with the type of respondents, perceived factors, and perceived Effectiveness of Learning Management System (LMS) - VLP

Table 7

Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Intercept Only	3385.147			
Final	3364.773	20.374	7	.005
Link function: Logit.				

Table 7 presents the model-fitting information of regression analysis. A p-value of 0.005 shows that there is a significant improvement in fit as compared to the null model, hence, the model is showing a good fit.

Table 8

Goodness-of-Fit

	Chi-Square	df	Sig.
Pearson	4615.871	4601	.436
Deviance	3346.411	4601	1.000

Table 8 presents the goodness-of-fit of regression analysis. A p-value of 0.436 indicates that the model adequately fits the data. This data revealed that there is no significant difference between the observed data and the fitted model.

Table 9

Pseudo R-Square

Model	-2 Log Likelihood
Cox and Snell	.017
Nagelkerke	.018
McFadden	.016

Link function: Logit.

Table 9 presents the pseudo-R-Square of regression analysis. The McFadden value of 0.016 suggests that there has been a 1.6% improvement in the prediction of outcomes based on the predictors in comparison to the null model.

Table 10

Test of Parallel Lines

Model	-2 Log Likelihood	Chi-Square	df	Sig.
Null Hypothesis	3364.773			
General	3339.248[b]	25.525[c]	21	.225

Table 10 presents the Test of Parallel Lines of regression analysis. This table was provided to test the assumption of the regression analysis that the odds of falling into a higher (vs. lower) category on Dependent Variable are the same across categories. The p-value of .225 indicates that this assumption was met.

Table 11 reveals the Parameter Estimates of regression analysis. As shown in the table the parameters estimate values for psychological/environmental-related *factors* resulted in 0.019 and 0.094 for technology/ease of

access-related factors. This obtains the interpretation of not significant. Data implied that the enumerated factors above positively influenced the respondents' frequency of using VLP.

Table 11

Parameter Estimates

Location	Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
						Lower Bound	Upper Bound
Psychological /Environmental related factors	.019	.071	.075	1	.784	-.119	.158
Technology Ease of Access related factors	.094	.074	1.588	1	.208	-.239	.052
System Quality	.037	.147	.065	1	.799	-.250	.325
Information Quality	.354	.140	6.413	1	.011	.080	.629
Service Quality	.164	.141	1.346	1	.246	-.440	.113
User Satisfaction and Learning Effectiveness	.026	.134	.039	1	.844	-.236	.288
[Respondent=Students]	-.396	.255	2.417	1	.120	-.895	.103
[Respondents= Faculty]	0[a]	.	.	0	.	.	.
Link function: Logit.							
a. This parameter is set to zero because it is redundant.							

Meanwhile, along with perceived *effectiveness*, 0.037 for the system quality; findings revealed 0.354 for information quality; 0.164 for service quality, and 0.026 for user satisfaction and learning effectiveness. Hence, the enumerated values are positive. The three mentioned predictors are found not significantly associated with engagement in the VLP. This further meant that the VLP is considered and tested effective in terms of system and service qualities user satisfaction and learning effectiveness. The system and the service provided by this LMS are acceptable to the users. On the other hand, in terms of information quality, it was found significant ($p>0.05$). This revealed that this predictor negatively influences engagement in the VLP. Information quality, thus negatively affects the VLP engagement.

Meanwhile, along *type of respondents*, the parameter estimate value resulted in -0.396. Hence, the analysis set the students as reference values. This implied that the frequency of utilization of the teacher is higher than the students. This may mean that the teachers more frequently accessed and used the VLP. This may further imply, that the students may be more affected by the factors and conditions that may pose as challenges and hindrances in their engagement to the VLP.

CONCLUSION

The findings from the research studies yielded the following conclusions.

Both the psychological/environmental and technology use/user capability/ease of access-related factors affect the instructors' and students' engagement in the VLP. The difficulty and non-difficulty experienced as the respondents utilize and access the VLP spell the difference between the negative and positive effects it brings to the users. Needless to say, those features that gave difficulty to the users must be managed and those which positively affect them must be further enhanced.

Based on the gathered data, the learning management system appears to be generally well-received by users, with a high overall satisfaction rate of 90.17%. However, there are areas for improvement in terms of learnability, efficiency, and memorability. Overall, the learning management system demonstrates a positive user experience, but it is crucial to address the identified usability issues to further enhance user satisfaction and learning outcomes. By

focusing on improving learnability, efficiency, and memorability, the system can achieve its full potential and provide an even more positive experience for its users.

The Learning Management System (LMS) assessment reveals a mixed performance. While the system excels in aiding learning goals and enjoys positive feedback regarding learnability, challenges arise in efficiency and memorability. A notable segment of users expresses discontent with certain efficiency aspects and needs help with memorability and personalized features. Additionally, service quality concerns surface prominently, especially in navigation, technical disruptions, and support responsiveness. Rectifying these areas is crucial to significantly enhancing the LMS creating a more supportive, user-friendly, and effective learning environment. Despite these hurdles, the high satisfaction rate and positive user intentions highlight the system's overall value. Targeted enhancements have the potential to boost user experience further and encourage sustained utilization and acceptance of the LMS.

ACKNOWLEDGMENT

I have dedicated considerable time and effort to this project, and it would not have been possible without the invaluable support of many individuals. I want to express my heartfelt gratitude to all of them.

I sincerely thank the Research Services Unit of CBSUA Sipocot Campus for their unwavering encouragement and essential support. My special thanks go to Mr. Dick Harence S. Dela Vega, Research Coordinator, and Ms. Ailyn F. Armenta, Research Staff, for their guidance and assistance.

I am also grateful to Mr. Rey A. Añonuevo for his expertise in handling this study's statistical treatment.

Finally, I sincerely appreciate my co-researchers, Ms. Maria Aileen P. Deleon, Mr. Arjay F. Llanera, and Mr. Kenneth B. Marquez, for their invaluable contributions and collaboration throughout this endeavor.

FUNDING STATEMENT

This research received support from the Research Services Unit at the Central Bicol State University of Agriculture - Sipocot Campus. The funders had no involvement in the study design, data collection and analysis, or manuscript preparation.

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