IJAMS
INTERNATIONAL JOURNAL OF ADVANCED MULTIDISCIPLINARY STUDIES
Volume V, Issue 5 May 2025, eISSN: 2799-0664

Adoption and Use of The Learning Management System (LMS) in The Tertiary Level of Samar Colleges, Inc.

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Abstract — With the potential to revolutionize student learning, learning management system (LMS) is finding its way into classrooms more and more. This study investigates the variables assessment on the use of learning management systems at the Samar Colleges, Inc. tertiary level in terms of perceived usefulness (PU) and perceived ease of use (PEOU) using the various LMS available today.

The study employed descriptive assessment research design, a systematic method when conducting information about a population, phenomenon or circumstances in order to identify and evaluate those characteristics

The study uses a Likert scale to measure satisfaction, specifically the perceived usefulness and ease of use of the teacher and student. This scale allows the respondents to express the experiences of the use of a learning management system (LMS) for both teachers and students. The results provide valuable insights into the experiences of both teachers and students in using the learning management system (LMS).

The study focuses on the assessment of how Samar Colleges, Inc. tertiary level adopted a selected learning management system specifically for the teachers and students: their learning experience, perceived Usefulness (PU), and perceived ease of use (POEU) using the Technology Acceptance Model (TAM). The study resulted in the highest satisfaction ratings for Google Classroom, showing perceived usefulness (PU) of 4.31 (Very Satisfied) for teachers and 4.55 (Very Satisfied) for students. The perceived ease of use (PEOU) for teachers also has a rating of 4.26 (Very Satisfied) and 4.51 (Very Satisfied) for students. On the other hand, LMS like Schoology, Canvas, Moodle, Blackboard, and other unlisted LMS resulted in a modest choice for teachers and students.

Keywords — LMS, Technology Acceptance Model (TAM), Perceived Usefulness (PU), Perceived Ease of Use (PEOU), School Assessment, Google Classroom, E-learning.

I. Introduction

In the modern era, the technology in education sector has becoming essential for teaching and learning experiences. The COVID-19 pandemic has left an indelible mark on the education system, causing a fundamental shift in the way we learn. This unprecedented situation propelled the accelerated adoption of educational technology (EdTech) as a means to ensure seamless continuity of learning. EdTech has emerged as a huge enabler, empowering institutions to cater to

changing student needs and foster the development of new skillsets regardless of geographical barriers (Shashank Joshi, 2023).

Samar Colleges, Inc., acknowledges the use of a Learning Management System (LMS). The institution is now equipped with the required technology resources, hardware, software, telecommunications, and human resources to support the needs of teachers and students. However, the institution used only any available learning management system (LMS) in the market, such as Google Classroom, Schoology, Canvas, Moodle, Blackboard, and other LMSs, where it only has basic functionalities, lacking the specific needs of the institution, more specifically in the tertiary level.

Thus, the researcher conducted this study to assess the technology resources of the institution in terms of hardware, software, telecommunication, and human resource; to assessed the status of the use of learning management system (LMS) for both teachers and students in terms of perceive usefulness (PU) and perceive the ease of use (PEOU). To assessed the significant difference of the use of learning management system (LMS) in terms of perceive usefulness (PU) and perceive the ease of use (PEOU).

Furthermore, the results of the study will be used to recommend the development of a customized Learning Management System (LMS) based on the findings. If the institution cannot afford the development of a customized LMS, the study recommends using an existing LMS that can be unified for both teachers and students.

Literature Review

A learning management system (LMS) is a platform application or a web-based technology that assess a specific learning process. It provides instruction, deliver content, monitor students' performance, and assess assignment grades. (Sun et al., 2008).

Learning Management System development is a helping hand interaction between teachers and students within the digital classroom. As defined by Coates et al. (2005), LMSs are designed to support learning by enabling course administration, content delivery, and communication in a structured and scalable way.

A tailor-made learning management system in the higher education seeks solutions to their unique academic structures in the institutional needs. Custom-built LMS platforms allow for the incorporation of institution-specific workflows, branding, user roles, and pedagogical approaches (Graf et al., 2010).

Real-time LMS collaboration tools that will facilitate teachers and students to collaborate on school projects, participate in discussion forums and share resources together with the teacher throughout live sessions (Bradley, 2021). This will introduce qualities like teamwork,

communication and problem-solving abilities in students making the learning environment more productive.

The adoption of a learning management system (LMS) focuses on understanding the influence of technology on the teacher and student at the tertiary level. LMS depends on multiple factors, including system quality, user satisfaction, perceived ease of use, and institutional support (Al-Fraihat et al., 2020).

Essentially, users are more likely to adopt a technology if they believe it's easy to learn and navigate (PEOU) and contributes value to their tasks (PU). Additional factors like attitude towards use (ATU) and perceived behavioral control (PBC) can also play a role. The TAM model was based on the theory of reasoned action, which posits that social behavior is motivated by an individual attitude that is designed to predict information system use (Lin, 2007).

The utilization of LMS significantly improves teachers' performance and students' academic achievement during distance learning. It also addresses the gaps and skepticism towards online learning. The study recommends that secondary schools maximize the use of LMS to improve instruction. The DepEd shall institutionalize the use of LMS in public secondary schools, especially during the disruption of regular classes. It shall also provide training and capacity building in the use of LMS so that teachers and learners will be able to use LMS effectively. Lastly, developers shall continue to enhance the features of LMS to cater to the needs of teachers, learners, and school administrators (Garcia, Espinosa, 2024).

II. Methodology

The study employed descriptive assessment research design, a systematic method when conducting information about a population, phenomenon or circumstances in order to identify and evaluate those characteristics (Wiersma & Gall et al, 2009). Rather than focusing on the "why" of the research question, this type of study is designed to understand the "what", which includes trends, attitudes, behaviors and demographics (Sekaran & Bougie 2016).

Also, according to Calderon & Calderon (2017), descriptive assessment research focuses on the existing conditions of relationships, prevailing practices, beliefs, processes, effects that are being felt, and trends. More specifically, it helps answer the what, when, where, and how questions regarding the research problem, rather than the why.

The researcher made use of quantitative research method. It predominantly employed quantitative data.

Variables were identified, observed, and measured. Surveys and observations were the most commonly used methods in this study. Therefore, the researcher used two types of methods. Set A, a short interview from the head of Management of Information Systems (MSTIS) to identify

the technology resources of Samar Colleges, Inc., and Set B, and to be answered by a questionnaire by the teachers and students so that the researcher understands the status of the use of technology using the Technology Acceptance Model (TAM) at the Samar Colleges, Inc. tertiary level.

A Likert scale is a type of scale used in survey research that measures respondents' attitudes towards a certain subject. Likert scale questions are single-choice, closed-ended questions, and the primary benefit of using a Likert scale is that it provides more granular information on people's attitudes towards a subject than a simple yes/no question type. By using a Likert scale, researchers can assess varying levels of agreement, importance, quality, and other factors (Roxana Elliott, 2021).

The study uses a Likert scale to measure satisfaction, specifically the perceived usefulness and ease of use of the teacher and student. This scale allows the respondents to express the experiences of the use of a learning management system (LMS) for both teachers and students. The results provide valuable insights into the experiences of both teachers and students in using the learning management system (LMS).

Table 1 shows the Likert scale to get the result and the mean of the study to interpret the responses of the respondents with the formula of r=max (5) – min (1), r1=r (4)/max (5), r2=r1(0.08), +1+0.08~4x Below shows the percentage of respondents and the interpretation scales of the study.

Table 1
Scale of Categorical Response, Range, and Interpretation

Categorical Response	Range	Interpretation Scale
5 - Very Satisfied (VS)	4.21 – 5.00	This score suggests the user finds the software effortless to use. They can navigate it intuitively and complete tasks with minimal effort, suggesting a high level of satisfaction of user experience.
4 – Satisfied (S)	3.41 – 4.20	This score indicates the user perceives the software as fairly easy to use. They can navigate it with relative ease and complete tasks without encountering significant difficulties.
3 – Neutral (N)	2.61 – 3.40	This score signifies a neutral perception. The user might find the software somewhat easy or difficult to use, with aspects that are straightforward and others that require more effort.
2 - Dissatisfied (D)	1.81 – 2.60	This score suggests the user has faced some difficulties while learning the software. While not effortless, they might be able to use it with some effort or after overcoming initial hurdles.
1 - Very Dissatisfied (VD)	1.00 – 1.80	This score indicates the user perceives the software as very difficult to use. They might encounter significant challenges in navigating the interface, understanding functionalities, or completing tasks.

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III. Results and Discussion

This chapter provides a thorough and comprehensive analysis of the data gathered from the instruments from Samar College, Inc. The data are tabulated and carefully examined using necessary statistical techniques.

Results

The results of the study provide a comprehensive understanding of the availability of technology resources and the acceptance of learning management system by both teachers and students at the Samar Colleges, Inc. tertiary level. Meticulous and emphasizes in-depth analysis of the test results.

Based on the interview with Samar Colleges, Inc. Management of Information Systems Technology Services (MISTS) head, the institution demonstrates readiness for technology modernization in terms of hardware, software, human resources, and telecommunication.

Table 2 shows the hardware technology resource in Samar Colleges, Inc. is revealed to be well-equipped based on the hardware data present.

The institution has a total of 13 laboratories, each with approximately 30 desktop computers with good computer specifications. The processing capabilities specification model ranges from 2010 to the recent generation. Each laboratory is equipped with interactive whiteboards and projectors. Each laboratory is equipped with a printer and scanner. Speakers, microphones, and cameras are also available in some laboratories.

Table 2
Technology Resource: Hardware

Item	Details
1.1 Number of Computer Laboratories	13 Laboratories.
1.2 Approximate Number of Desktop Computers per Lab	30 Units per Laboratory
1.3 Installed CPU Models	Ranges from Below 2010 to Recent Generations
1.4 Installed RAM Sizes	Ranges from Below 2010 to Recent Generations
1.5 Installed GPU / Video Card Models	Integrated & Discrete GPUs from Below 2010 to Recent Generations
1.6 Installed Sound Card Models	Mostly Integrated Sound Cards
1.7 Installed Storage Types	HDD, SSD, M.2, Diskless systems
1.8 Installed Storage Sizes	Below 512 GB, 1–2 TB, 3–4 TB, and Higher than 4 TB
1.9 Instructional Tools in Classrooms	Projectors and Interactive Whiteboards are available
1.10 Printers and Scanners Availability	Available in every laboratory

Table 3 shows the Software technology resource in Software Samar Colleges, Inc. is revealed to be well-equipped based on the software data present.

The institution uses the Windows operating system. The subject-specific software institution uses Adobe Creative Suite and Visual Studio. Productivity software uses the Microsoft Office suite. No specific answer was provided for educational software. Lastly, Avast and Windows Defender are used for anti-malware software.

Table 3
Technology Resource: Software

Item	Details
2.1 Operating System	Windows Operating System
2.2 Subject-Specific Software	Adobe Creative Suite, Visual Studio, etc. used for design, programming, and multimedia related courses
2.3 Productivity Software	Microsoft Office Suite
2.4 Educational Software	No specific answer provided
2.5 Antivirus/Anti-Malware Software	Avast, Windows Defender
2.6 Filtering Software	No specific answer provided

Table 4 shows the telecommunication technology resource in Samar Colleges, Inc. is revealed to be well-equipped based on the telecommunication data present.

The internet speed, or bandwidth, is equipped with T1 high-speed internet lines. Wi-Fi, or wireless fidelity, is also available. The network infrastructure is a hybrid infrastructure using wired, wireless, and fiber optic networks. Third-party applications are also used as a tool for communication. Lastly, the institution has its website.

Table 4
Technology Resource: Telecommunication

Item	Details
3.1 Internet Speed/Bandwidth	T1 Lines – High-speed internet available
3.2 Wi-Fi Access	Yes, accessible throughout the school
3.3 Internet Access Restrictions	Yes, restrictions such as website filtering and ad-blocking are applied
3.4 Network Infrastructure	Combination of Wired, Wireless, and Fiber Optic network infrastructure
3.5 Communication Tools Used	School email system and third-party applications for video conferencing and messaging
3.6 School Website	Yes, the institution maintains its own official website

Table 5 shows the human resource technology resource in Samar Colleges, Inc. is revealed IT capabilities base in data present.

The staff possesses a wide range of technical competencies, basic computer literacy and troubleshooting, software development, CCTV services, database management systems, and network administration.

The MISTS department's scope of responsibilities includes hardware and software troubleshooting, procurement, software and system development, maintenance and repairs, IT support at all levels, and lastly, IT consulting.

The support towards the institution also contributes to the development of the evaluation of procurement and post-training feedback integration.

Table 5
Technology Resource: Human Resource

Item	Details
4.1 MISTS Staff Technical Expertise	- Basic computer literacy and troubleshooting - Computer software development - CCTV services - Database Management System (DBMS) - Network administration
4.2 Scope of Responsibilities (MISTS Office)	- Basic troubleshooting for other devices - Computer troubleshooting - Procurement of computer equipment - School software and system development - Other hardware maintenance - Departmental IT support - Individual workstation support - IT consultation and advising
4.3 MISTS Staff Support to Institution	- Assessment of computer equipment procurement - Accepting feedback post-training to improve future programs

Overall, the findings indicate that the institution possesses the necessary technological infrastructure, human capital, financial resources, and institutional support to successfully develop and implement a customized LMS.

The majority of students prefer using Google Classroom over other LMS platforms due to its ease of use, accessibility, and seamless integration with Google services such as easy to login using google accounts.

In this section, an analysis of teachers and students starts by tabulating the data gathered needed by frequency distribution and percentage.

A frequency distribution shows the frequency of repeated items in a graphical form or tabular form. It gives a visual display of the frequency of items or shows the number of times they occurred. Let's learn about frequency distribution in this article in detail (Cuemath, n.d.).

Table 6 shows the frequency distribution of teachers and students the total population of 294 participants in the study. The frequency distribution of teachers is 41 at 14 percent, while the frequency distribution of students is 253 at 86 percent.

Table 6
Frequency Distribution: Teachers and Students

Position	Frequency	Percentage
Teachers	41	14%
Students	253	86%
Total	294	100%

Table 7 shows the summary of the satisfaction for each LMS between teachers and students.

Google Classroom, The teacher perceived usefulness scores of 4.31 (Very Satisfied VS) and perceived ease of use (PEOU) scores of 4.26 (Very Satisfied VS). The student perceived usefulness scores of 4.55 (Very Satisfied VS), and perceived ease of use (PEOU) scores of 4.51 (Very Satisfied VS).

Schoology, The teacher perceived usefulness scores of 2.89 (Neutral N) and perceived ease of use (PEOU) scores of 2.73 (Neutral N). The student perceived usefulness scores of 4.01 (Satisfied S), and perceived ease of use (PEOU) scores of 4.12 (Satisfied S).

Canvas, The teacher perceived usefulness scores of 4.11 (Satisfied S) and perceived ease of use (PEOU) scores of 4.09 (Satisfied S). The student perceived usefulness scores of 3.78 (Satisfied S), and perceived ease of use (PEOU) scores of 4.06 (Satisfied S).

Moodle, The teacher perceived usefulness scores of 0 (No record) and perceived ease of use (PEOU) scores of 0 (No record). The student perceived usefulness scores of 4.05 (Satisfied S), and perceived ease of use (PEOU) scores of 3.97 (Satisfied S).

Blackboard, The teacher perceived usefulness scores of 3.89 (Satisfied S) and perceived ease of use (PEOU) scores of 3.36 (Satisfied S). The student perceived usefulness scores of 0 (No record), and perceived ease of use (PEOU) scores of 0 (No record).

Unlisted LMS, The teacher perceived usefulness scores of 4.72 (Very Satisfied VS) and perceived ease of use (PEOU) scores of 4.45 (Very Satisfied VS). The student perceived usefulness scores of 0 (No record), and perceived ease of use (PEOU) scores of 0 (No record).

Table 7
Summary of the Satisfaction for Each LMS Between Teachers and Students.

LMS	Teacher	Description	Students	Description
Google Classroom				
Perceived Usefulness (PU)	4.31	Very Satisfied (VS)	4.55	Very Satisfied (VS)
Perceived Ease of Use (PEOU)	4.26	Very Satisfied (VS)	4.51	Very Satisfied (VS)
Schoology				
Perceived Usefulness (PU)	2.89	Neutral (N)	4.01	Satisfied (S)

Perceived Ease of Use (PEOU)	2.73	Neutral (N)	4.12	Satisfied (S)
Canvas				
Perceived Usefulness (PU)	4.11	Satisfied (S)	3.78	Satisfied (S)
Perceived Ease of Use (PEOU)	4.09	Satisfied (S)	4.06	Satisfied (S)
Moodle				
Perceived Usefulness (PU)	0.00	No record	4.05	Satisfied (S)
Perceived Ease of Use (PEOU)	0.00	No record	3.97	Satisfied (S)
Blackboard				
Perceived Usefulness (PU)	3.89	Satisfied (S)	0.00	No record
Perceived Ease of Use (PEOU)	3.36	Satisfied (S)	0.00	No record
Unlisted LMS				
Perceived Usefulness (PU)	4.72	Very Satisfied (VS)	0.00	No record
Perceived Ease of Use (PEOU)	4.45	Very Satisfied (VS)	0.00	No record

Discussion

Samar Colleges, Inc. indicates that it demonstrates readiness for technology modernization in terms of hardware, software, human resources, and telecommunication. The institution possesses the necessary technological infrastructure, human capital, financial resources, and institutional support to successfully develop and implement a customized LMS more specifically:

The institution has a large number of infrastructures with thirty (30) computer units per computer laboratory that can accommodate a one-to-one ratio in the classroom laboratories. Based on the result of the study, the range of the specification of computer units is from the year 2010 to the recent generation. The storage capabilities are sufficient, and this ensures the ability to handle a large amount of data. The audio-visual equipment is also available in some laboratories, such as speakers, microphones, and cameras. This ensures the effectiveness of multimedia lessons, such as text, audio, visual, and animations for both teachers and students. The instructional tools in the classroom are equipped with projectors and whiteboards that can engage modern and old ways of pedagogy, resulting in a positive learning experience for both teachers and students.

The institution demonstrates a well-equipped telecommunication infrastructure with an Internet speed or bandwidth of T1 high-speed line that provides a reliable and consistent internet connection that ensures digital tools and online resources can be accessed effectively and efficiently for the essential needs of the teacher and students. The teacher and student stay connected within the institution because Wi-Fi is available throughout the campus; other than that, it utilizes hybrid infrastructures using wired, wireless, and fiber optics networks. Third-party applications are also used in the institution for conferencing and messaging. Lastly, there is a public communication resource available via the school website to provide various portals for teachers and students.

The technical staff of the institution demonstrates positive competencies like basic computer literacy and troubleshooting, ensuring to resolve common issues to keep the operation

effective and efficient. The institution has an in-house development team, the Management of Information Systems Technology Services (MISTS), ensuring a tailored institutional need. Surveillance support is also available to ensure the security of the campus; the scope of responsibilities covering preventive and corrective tasks like hardware and software troubleshooting ensures efficient operations, and procurement oversight is involved in selecting appropriate technology essentials for the needs of both teachers and students. Software and development is one of the highlights of the department, ensuring the innovative needs of institutional needs; and lastly, accepting post-feedback for both teacher and student for continuous improvement of the institution's needs.

The perceived usefulness (PU) and perceived ease of use (PEOU) for both categories were separated based on the LMS that the teacher and students chose in the form of a tabular presentation to better visualize the result. There were six (6) LMS to compare if there were significant differences for perceived usefulness (PU) and perceived ease of use (PEOU), among the LMS: Google Classroom, Canvas, Schoology, Moodle, Blackboard, and Unlisted LMS between teachers and students to better understand the user experiences for each group was meticulously flattened into tabular form to enable a comprehensive comparison and highlighting core components and performance

Google Classroom for both teachers and students responded very positively to the LMS, especially in the areas of organization, productivity and learning success. The LMS shows dominance among the other LMS platform. Although both groups valued the LMS highly, students gave it slightly higher appraisals than the teachers indicating that both think this can be particularly beneficial to their own learning. The LMS was rated highly on usability by both teachers and students, though students tended to find the LMS easier to navigate and use than teachers. Although both groups reported that the LMS is clear, accessible, and recaps intuitively, students rated these items even higher, indicating that they find it easier to use the features available in the platform vs the other LMS.

IV. Conclusion

The technology resources at Samar Colleges, Inc. are well-equipped, but some hardware are outdated and needs to be upgraded to ensure efficient operation. To ensure the legality of the software used by the staff by providing legal and licensed software that meets institutional needs, while also enhancing security and live access support for both teachers and students. Moreover, the current technology resources of the institution are physically capable of meeting the processing requirements necessary to support a customized Learning Management System (LMS).

The status of use of learning management systems (LMS) at the tertiary level of Samar Colleges, Inc., dominates Google Classroom in perceived usefulness (PU) for the teachers, the overall contribution of efficient learning processes, valuable tools, organized lessons, effective

task performance, and functionalities, while the students also have good results in effective task performance, organized lessons, calendars and notifications, valuable tools, learning methods, and functionalities.

When it comes to the perceived ease of use (PEOU), the teacher resulted high in navigational function in the LMS, user-friendly platform, content delivery, and easy-to-access course materials, while the students also had good results in accessing materials, accessibility of learning resources, and comfortableness using the LMS.

Furthermore, if given the chance to develop a customized LMS, the perceived usefulness (PU) and perceived ease of use (PEOU) mentioned above must be highly considered because they directly influence user satisfaction, engagement, and the overall effectiveness of the platform for both teachers and students.

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