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Research Article

Impact of information literacy on the utilization of LMS in Uganda: A Case study of Soroti University

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Abstract

Background: Learning Management Systems (LMS) are essential tools in higher education for supporting teaching, learning, and access to digital resources. However, effective utilization depends on users' information literacy competencies..

Purpose: This study examined impact of information literacy on LMS utilization at Soroti University. Specifically, it assessed the status of LMS, examined users' information literacy levels, identified challenges affecting LMS usage, and proposed strategies for improving utilization.

Methodology: A cross-sectional descriptive research design using quantitative and qualitative approaches was adopted. Data were collected from 45 respondents, including academic, administrative and support staff, and students selected through stratified random and purposive sampling. Data were collected using closed-ended questionnaires and interview schedules. Quantitative data were analyzed using SPSS, while qualitative data were analyzed thematically using ATLAS.ti.

Results: The findings revealed that LMS at Soroti University is operational and accessible, although utilization differs across departments. A strong positive and statistically significant relationship existed between information literacy and LMS utilization ($r = .729$, $p = .000$). Regression analysis showed that information literacy explained 53.1% of the variation in LMS utilization ($R^2 = .531$). Challenges included limited awareness of LMS functionalities, poor internet connectivity, inadequate technical support, insufficient ICT infrastructure, and continued preference for traditional teaching methods.

Conclusion: The study concluded that information literacy significantly influences effective LMS utilization in higher education institutions..

Implications: The findings contribute to understanding factors affecting technology adoption in higher education and highlight the need for continuous digital literacy trainings, improved ICT infrastructure, technical support, and institutional awareness programs to strengthen LMS utilization..

Keywords: *Information Literacy, IL, learning management system, LMS, Uganda, Soroti University*

Introduction

E-learning has become a significant innovation in higher education, with universities increasingly adopting Learning Management Systems (LMS) such as Moodle, Blackboard, and Canvas to support teaching, learning, and research activities. In Africa, including at Soroti University, LMS platforms are widely used to facilitate blended and virtual learning approaches, enhance collaborative learning, improve access to educational resources, and strengthen communication between learners and instructors. Blended learning, which combines digital technologies with face-to-face instruction, is increasingly recognized as an effective approach to modern education delivery. However, the successful utilization of LMS platforms largely depends on users' information literacy competencies, including their ability to identify information needs, access, evaluate, and effectively use digital information resources. At Soroti University, the library and Library and Information Science (LIS) professionals support information literacy through user education, digital literacy training, and academic support

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services. Despite the introduction of LMS platforms and information literacy programs, variations still exist in how effectively students and lecturers utilize LMS services, with some users facing challenges in navigating platforms, accessing electronic resources, and participating in online academic activities. These challenges indicate that LMS utilization is closely associated with users' information literacy levels. Nevertheless, there remains limited empirical research examining the influence of information literacy on LMS utilization in higher institutions of learning, particularly at Soroti University. Therefore, this study aims to assess the impact of information literacy on LMS utilization at Soroti University by addressing existing knowledge gaps and providing evidence to support effective e-learning implementation.

General objective of the study

This research study assessed the impact of information literacy on LMS utilization at Soroti University.

Specific objectives of the study

1. To find out the status of LMS at Soroti University
2. To establish the information literacy levels of users in using the LMS at Soroti University
3. To identify the challenges affecting the usage of LMS at Soroti University
4. Establish the strategies for improving LMS usage at Soroti University

Literature Review

The importance of conducting a critical literature review is vital to properly comprehending the impact of information literacy on the use of LMS. Economic, technological, and social forces, among others, have recently driven academic institutions to adopt LMS in their delivery of academic services. These present difficulties that institutions must consider to provide educational services that best meet the needs of their students. According to Nanayakkara's (2007) research, learning management systems are now a common form of e-delivery for many institutions. An LMS is a self-contained webpage with integrated instructional technologies that enables teachers to arrange academic content and involve students in their learning (Gautreau, as cited in Coleman & Mtshazi, 2017).

Status of LMS

According to extant literature on the use of Learning Management Systems (LMS), many higher education institutions invest substantial financial resources in acquiring instructional technologies and learning materials (Keengwe, Onchwari, & Wachira, 2008). However, these scholars observe that the implementation of such technologies has not always been successful, particularly in African countries. Although institutions recognize the importance of LMS in delivering eLearning services and allocate budgets for its implementation, concerns remain regarding the adequacy of funding for sustaining eLearning services, purchasing instructional resources such as eBooks, and training lecturers and students in LMS usage.

Similarly, Kim (2008) notes that many lecturers and academic staff are reluctant to adopt e-learning tools such as LMS platforms for instructional purposes, preferring traditional teaching methods instead. This highlights the need for further research to establish the factors influencing academic staff's adoption or non-adoption of LMS platforms and resources, which would support effective institutional planning.

E-learning, as explained by Ajayi (2005), is a modern pedagogy that employs electronic devices such as computers, laptops, tablets, phones, and the internet to facilitate learning through LMS platforms. The author emphasizes that eLearning enables learners to access quality learning materials and interact effectively

with instructional content and facilitators, regardless of location. Nevertheless, the effectiveness of LMS-based eLearning largely depends on learners' intrinsic motivation and willingness to engage with the system.

Therefore, the effectiveness of LMS usage depends not only on the availability of adequate resource collections but also on users' familiarity with the information resources available on the system. Consequently, the development of LMS resource collections should be carried out collaboratively with users to ensure that the resources meet their learning needs and motivate continuous engagement.

Information literacy levels of users on LMS

Learning Management Systems (LMS) have transformed educational delivery in the digital era, making information literacy a critical factor for effective utilization of these platforms. Studies indicate that students with strong information literacy skills participate more actively in LMS content, discussions, and assignments, which contributes to improved academic performance (Choi & Jacobs, 2011; Chan & Hew, 2016). Furthermore, information-literate students demonstrate enhanced critical thinking abilities through effective analysis and synthesis of information accessed via LMS platforms (Fairuz, 2019).

Research also shows that educators with information literacy training are more likely to integrate diverse digital resources and LMS tools into their teaching practices, thereby enriching students' learning experiences (Johnson & Watson, 2018; Tella, 2022). In addition, instructors who possess information literacy competencies are better positioned to design LMS-supported learning activities that promote independent information-seeking and self-directed learning among students (Wang, 2020).

Overall, studies conducted between 2011 and 2022 demonstrate that information literacy plays a significant role in effective LMS utilization. Students and educators with higher levels of information literacy are better able to use LMS features efficiently, resulting in improved teaching and learning outcomes. These findings further emphasize the importance of addressing information literacy gaps to ensure equitable access to and effective use of LMS platforms.

Factors that affect use of LMS

Learning Management Systems (LMS) have become essential tools in education for content delivery, collaboration, and assessment, although their effective utilization depends on several interconnected factors. Perceived ease of use and usefulness are among the major determinants of LMS adoption, as users are more likely to engage with systems they find user-friendly and beneficial to teaching and learning activities (Davis, 1989; Venkatesh & Davis, 2000). In addition, institutional support through technical assistance, training workshops, and responsive help services significantly enhances users' confidence, satisfaction, and participation in LMS platforms (Chen et al., 2012; Dahlstrom et al., 2014).

Furthermore, the compatibility of LMS platforms with different teaching approaches influences educators' willingness to integrate them into instruction. Systems that support diverse pedagogical methods and content customization are more widely accepted by instructors (Al-Rahmi et al., 2019). Reliable technical infrastructure and accessibility are also essential for effective LMS utilization, as challenges such as slow system performance and limited device compatibility can reduce engagement, while accessibility through smartphones and tablets increases flexibility and participation (Alshehri & Drew, 2010; Gikas & Grant, 2013). Overall, literature suggests that improving training, institutional support, and technological infrastructure can greatly enhance effective LMS adoption and utilization in educational settings.

Strategies for improving usage of LMS

Effective use of Learning Management Systems (LMS) depends on strategies that enhance user experience, accessibility, and technical skills. Research shows that improving technological features, such as increasing system capacity and integrating tools like Twitter and advanced mathematics editors, can significantly enhance LMS usage (Coleman, 2017).

Providing adequate technological resources is also important. A study by Olema (2020) found that supplying students with laptops was considered one of the most effective strategies for improving e-learning usage in universities. The study further noted that regular use of LMS platforms increases users' confidence, familiarity, and system functionality skills.

Continuous evaluation of LMS services and performance is another key strategy, as it helps build user confidence and ensures that the system meets institutional needs. In addition, training and retraining of both lecturers and students should be ongoing, to develop practical ICT and LMS usage skills. Okeke (2024) emphasized the importance of continuous teacher training in the effective use of ICT for successful LMS integration.

Methodology

A cross-sectional descriptive study design employing both quantitative and qualitative research approaches was used among a sampled population of 45 respondents, comprising 32 males and 13 females. The respondents included 33% (15) academic staff, 22% (10) administrative staff, 9% (4) support staff, and 36% (16) students of Soroti University, including key informants. Soroti University was purposively selected because it had integrated Learning Management System (LMS) platforms into teaching, learning, and research, while also offering an Information Literacy course unit facilitated by the library department. This provided a suitable context for examining the relationship between information literacy and LMS utilization due to variations in users' ability to effectively access and utilize digital learning resources. Respondents were selected based on their direct involvement in LMS usage and Information Literacy activities, including students who had undertaken the Information Literacy course unit, lecturers using the LMS for teaching and learning, and the librarian responsible for Information Literacy instruction and digital learning support. Respondents were further selected based on their experience with digital learning platforms, availability, and willingness to participate in the study.

Stratified random sampling was employed to ensure representation of key respondent groups in LMS utilization. The population was divided into strata: academic staff, administrative staff, support staff, and students. Respondents were randomly selected from each stratum using sampling frames based on staff and student registers, with the number selected proportionate to each stratum's size, to minimize bias.

A self-administered, closed-ended questionnaire based on a five-point Likert scale was used to collect quantitative data from academic staff, administrative staff, support staff, and students. The questionnaire contained closed-ended items designed to assess respondents' perceptions regarding information literacy and LMS utilization at Soroti University. To ensure the suitability of the instruments, both validity and reliability tests were conducted. Content validity was established through expert review involving the LMS specialist, Director of ICT, and lecturers, who assessed the relevance, clarity, and adequacy of the items in measuring the study variables. Their recommendations were incorporated to improve the quality of the instruments. Reliability was tested using Cronbach's Alpha, which produced a coefficient value of 0.869 for the 21 questionnaire items, indicating a high level of internal consistency

and confirming that the instruments were reliable for data collection.

Qualitative data were obtained from five purposively selected key informants (R1-R5), representing a cross-section of administrative and academic leadership at Soroti University. Respondents were strategically drawn from the schools of Engineering and Technology and Health Sciences, alongside the Directorates of ICT, the Department of Library Services, and the Department of Open Distance and E-learning. These informants were selected as information-rich cases due to their seniority and specialized expertise in the dynamics of LMS and eLearning implementation. Their high-level management perspective provided critical insights into the study. The resulting interview data were subjected to thematic analysis using ATLAS.ti to identify recurring semantic patterns. A systematic three-stage process was employed. First, transcripts were imported for data immersion and open coding to identify recurrent semantic patterns related to the implementation of LMS.

The first codes were then iteratively grouped into coherent categories through axial coding to construct relationships between concepts. The categories were subsequently combined into overarching themes by leveraging the networking tools within the software and further refined using the raw transcripts to ensure analytical rigor. This structured approach saw that the high-level management perspectives were accurately captured and represented.

Quantitative data were edited, coded, tabulated, and analyzed using SPSS software, while findings were presented using tables, charts, and graphs. Ethical approval and administrative permission were obtained from the Directorate of Research and Innovation at Soroti University, before data collection commenced. Informed consent was obtained from all respondents after explaining the purpose of the study, the procedures involved, the voluntary nature of participation, and the right to withdraw at any stage without penalty. Respondents were also informed of their right to decline answering questions they found uncomfortable. To ensure confidentiality and anonymity, respondents were not required to provide personal identifiers, and all collected information was used strictly for academic purposes. The researchers securely stored the data and restricted access to the research team only. The authors further declared that AI tools were used solely for language editing and manuscript refinement during the revision process. The study received no external funding, and the authors declared no conflicts of interest.

Presentation of results and discussions of findings

This section presents the findings of the study in line with the research questions using the inputs from the data analyzed gathered from the questionnaires administered to the respondents.

As indicated in Table 1, the population of the study was 45 respondents. This included 71% (32) males and 29% (13) females. It included both the key informants and other respondents. It is, therefore, important to note that there were more males than females in the study. This, however, was not by design but rather an indication that the number of male staff and students is more than that of their female counterparts. The respondents in this study were deliberately involved in the investigation because they had the required knowledge about the subject under study and were available for the study to change the status quo of LMS use at Soroti University (SUN).

In Table 2, the respondents in this study comprised the current staff and students of Soroti University and the key informants. The academic staff who participated in this study were 37.5%, the administrative staff was only 12.5%, the support staff were 10%, and students were the highest, at 40%.

Table 1: The percentage distribution of respondents at SUN (n=45)

Gender	Frequency	Percentage
Male	32	71
Female	13	29
Total	45	100

Source: (Primary source, 2025)

Table 2: The distribution of the respondents' designation at Soroti University (n=45)

Category	Frequency	Percentage (%)
Academic Staff	15	33
Administrative Staff	10	22
Support Staff	4	9
Students	16	36
Total	45	100

Source: (Primary source, 2025

Table 3: Status of LMS at Soroti University (n=45)

Perspective on the status of LMS at SUN	SA	%	A	%	NS	%	D	%	SD	%
I know about the existence of an LMS at SUN	19	47.5	10	25.0	00	00.0	07	17.5	04	10.0
LMS at SUN has a variety of resources	12	30.0	12	30.0	10	25.0	04	10.0	02	05.0
LMS at SUN is accessible to users	08	20.0	13	32.5	09	22.5	10	25.0	00	00.0
LMS at SUN addresses users' needs	06	15.0	15	37.5	13	32.5	06	15.0	00	00.0
LMS at SUN is user-friendly	06	15.0	15	37.5	14	35.0	05	12.5	00	00.0

SA= Strongly Agree, A= Agree, NS= Not Sure, D= Disagree, SD= Strongly Disagree

Source: (Primary source, 2025)

Management System (LMS) at Soroti University. When respondents were asked about their knowledge of the existence of LMS at SUN, 19 (47.5%) of the respondents strongly agreed and demonstrated a high level of awareness of the existence of LMS at SUN, while 10 (25%) agreed that the LMS exists at SUN. However, 7 (17.5%) disagreed that they knew about it, and 4 (10%) strongly disagreed with the existence of the LMS at SUN.

The above findings are supported by the qualitative findings, where respondents acknowledged that the LMS at Soroti University is operational and supports teaching and learning activities. One respondent explained that:

"The LMS is operational and accessible to both students and staff, although utilization levels vary across departments. Some faculties actively integrate LMS tools into teaching and learning, while others still depend heavily on traditional face-to-face approaches." (R.1) Similarly, R.2 noted that: "The LMS infrastructure is functional and supports online teaching and learning activities, although it still requires improvement in bandwidth optimization, server capacity, and maintenance support."

These findings confirm that the majority of respondents are aware of the LMS and recognize its presence and functionality within the university.

In regard to the variety of learning resources in the LMS, 12 (30%) both agreed and strongly agreed that the LMS contains a variety of teaching and learning resources, while 10 (25%) were not sure about the existence of such resources. However, 4 (10%) disagreed, and 2 (5%) strongly disagreed with the notion that the LMS at SUN has a variety of teaching and learning resources.

These findings are reinforced by the qualitative responses, where respondents emphasized the importance and relevance of the LMS in supporting access to learning materials.

R.5 reiterated SUN library's commitment to acquiring electronic resources through the Consortium of Uganda University Libraries. All the links to these resources were available on the LMS interface and relevant to the academic use of the LMS.

On the other hand, respondents acknowledged that the LMS facilitates content sharing and access to learning materials, confirming the quantitative findings that the LMS contains useful academic resources for users.

As far as accessibility of the LMS is concerned, 8 (20%) strongly agreed that the LMS at SUN is accessible to users while 13 (32.5%) agreed with the same. However, 9 (22.5%) of the respondents were not sure of LMS accessibility and 10 (25%) disagreed with the notion of LMS accessibility.

The qualitative findings support these results, particularly regarding the mixed perceptions about accessibility. Respondents acknowledged that although the LMS is accessible, several infrastructural challenges limit effective access and utilization. R.2 observed that the LMS still requires improvement in "bandwidth optimization, server capacity, and maintenance support," while other respondents identified poor internet connectivity and limited ICT infrastructure as barriers affecting LMS usage. These responses explain why some respondents were uncertain or disagreed about the accessibility of the LMS.

On matters of whether the LMS at SUN addresses users' needs, 6 (15%) of the respondents strongly agreed, and 15 (37.5%) agreed that the LMS addresses users' needs. Nevertheless, 13 (32.5%) were not sure whether the LMS addresses users' needs, while 6 (15%) disagreed with the statement.

Regarding the user friendliness of the LMS at SUN, 6 (15%) strongly agreed, and 15 (37.5%) agreed that the LMS is user-friendly. However, 14 (35%) were not sure about the user friendliness of the LMS, whereas 5 (12.5%) disagreed that the LMS is user-friendly to users.

The qualitative findings equally support these concerns. Respondents highlighted that some users still face challenges in effectively utilizing the LMS due to inadequate ICT skills, low awareness about LMS functionalities, and insufficient technical support. These challenges may contribute to uncertainty among respondents regarding the user friendliness of the system.

The information literacy levels of users using LMS at Soroti University (n=45)

Table 4 above presents the perspectives on information literacy levels of users in using the LMS at Soroti University. When respondents were asked whether they knew how to access

the LMS, 13 (32.5%) of the respondents strongly agreed and a similar number agreed that they knew how to access the LMS. Meanwhile, 1 (2.5%) was not sure about how to access the LMS at SUN, while 11 (27.5%) disagreed and 2 (5%) strongly disagreed about their levels of knowledge in accessing the LMS at SUN.

Table 4: Showing the perspective on information literacy levels of users in using the LMS at Soroti University

Perspective on information literacy levels	SA	%	A	%	NS	%	D	%	SD	%
I know how to access the LMS	13	32.5	13	32.5	01	02.5	11	27.5	02	05.0
I can readily identify and search the LMS for the information I need to design course content or do coursework	13	32.5	11	27.5	04	10.0	12	30.0	00	00.0
I can compare and evaluate content from the LMS	13	32.5	09	22.5	09	22.5	09	22.5	00	00.0
I can easily organize content using the LMS	08	20.0	10	25.0	11	27.5	11	27.5	00	00.0
I fully understand the copyright laws regarding the use of resources in the LMS	06	15.0	05	12.5	08	20.0	15	37.5	06	15.0

SA= Strongly Agree, A= Agree, NS= Not Sure, D= Disagree, SD= Strongly Disagree

Source: *(Primary source, 2025)*

The above quantitative findings are supported by the qualitative findings where respondents emphasized that information literacy competencies significantly influence effective utilization of the LMS.

R.1 explained that: “Users with stronger information literacy competencies are more capable of navigating the LMS, searching for learning resources, uploading coursework, and participating in online discussions effectively.” This finding confirms that respondents with stronger information literacy skills are more confident in accessing and utilizing the LMS. However, R.1 further observed that: “Those with limited information literacy often struggle with accessing and organizing digital content.” This supports the responses of respondents who disagreed or were uncertain about their ability to access the LMS.

Regarding whether respondents could readily identify and search the LMS for information needed to design course content or do coursework, 13 (32.5%) strongly agreed and 11 (27.5%) agreed with the statement. However, 4 (10%) were not sure whether they could identify or search the LMS for information they needed, while 12 (30%) disagreed with the same notion.

These findings are reinforced by the qualitative responses, where respondents acknowledged that users with strong information literacy competencies are better able to search and retrieve learning materials from the LMS. R.1 stated that users with adequate information literacy skills can effectively navigate the LMS and search for learning resources.

Similarly, R.4 explained that: “Some students experience challenges in identifying credible academic sources, searching scholarly databases, and properly evaluating online information.”

This supports the quantitative findings showing that some respondents still experience difficulties in identifying and searching for relevant information through the LMS.

As far as comparison and evaluation of content from the LMS is concerned, 13 (32.5%) strongly agreed and 9 (22.5%) agreed that they are able

to compare and evaluate content from the LMS on their own. However, 9 (22.5%) were not sure and another 9 (22.5%) disagreed with their ability to compare and evaluate LMS content.

The qualitative findings equally support these results. Respondents indicated that users with stronger information literacy competencies are more capable of evaluating information and participating effectively in online learning activities. In addition,

R.5 noted that: "Information literacy competencies vary among students. Some students effectively search and evaluate medical information, while others need additional support in using academic databases and digital learning resources."

This explains why some respondents were uncertain or disagreed with their ability to compare and evaluate LMS content independently.

Concerning the organization of content using the LMS, 8 (20%) strongly agreed, while 10 (25%) agreed that they can easily organize content using the LMS at SUN. However, 11 (27.5%) were not sure, and another 11 (27.5%) strongly disagreed with the notion that they can easily organize content using the LMS at SUN.

To determine whether respondents as users of the LMS at SUN have technical knowledge of copyright laws regarding the use of resources in the LMS, 6 (15%) strongly agreed, and 5 (12.5%) agreed that they understand copyright laws regarding the use of LMS resources. However, 8 (20%) were not sure, 15 (37.5%) disagreed, and 6 (15%) strongly disagreed with their understanding of copyright laws regarding the use of resources in the LMS.

The qualitative findings further support these results. R.5 observed that information literacy competencies vary among users, with some students effectively utilizing digital learning resources, while others require additional support in using academic databases and online resources. This implies that although some users possess adequate information literacy competencies, others still have limited awareness regarding ethical and legal use of digital information resources, including copyright issues.

These findings demonstrate that information literacy is essential for effective LMS utilization at Soroti University. Users with stronger competencies in accessing, evaluating, organizing, and ethically using information were better able to engage with digital learning resources. This highlights the important role of the University Library and its information literacy program in supporting effective use of LMS platforms and promoting digital learning in higher education. The findings are supported by the qualitative responses, where R.1 emphasized that users with strong information literacy competencies participate more effectively in online learning activities and utilize LMS resources more efficiently.

The factors affecting the usage of LMS at Soroti University

Table 5: The perspective factors affecting the usage of LMS at Soroti University (n=45)

Perspective factor	SA	%	A	%	NS	%	D	%	SD	%
Lack of user awareness about the LMS and its features	13	32.5	11	27.5	05	12.5	10	25.0	01	02.5
Information quality (relevance, accuracy, etc.) uploaded into the LMS	08	20.0	17	42.5	10	25.0	03	07.5	02	05.0
Lack of training and technical support on LMS use	12	30.0	08	20.0	07	17.5	07	17.5	06	15.0
Preference for the traditional method of problem-solving and learning to use LMS	08	20.0	16	40.0	03	07.5	06	15.0	07	17.0
Users 'attitude towards the use of LMS	06	15.0	17	42.5	05	12.5	08	20.0	04	10.0

System quality (Interface and interactiveness)	03	07.5	14	35.0	12	30.0	06	15.0	05	12.5

SA= Strongly Agree, A= Agree, NS= Not Sure, D= Disagree, SD= Strongly Disagree

Source: *(Primary source, 2025)*

Questionnaires distributed to both staff and students revealed that there were various factors affecting LMS usage at Soroti University. Table 5 above presents the findings on the factors affecting the usage of LMS at Soroti University. According to the responses, lack of awareness about the LMS and its features was among the major hindrances as shown by 13 (32.5%) of the respondents who strongly agreed and 11 (27.5%) who agreed with the same statement. Meanwhile, 5 (12.5%) were not sure about user awareness regarding the LMS and its features, whereas 10 (25%) disagreed and 1 (2.5%) strongly disagreed with the same notion.

The quantitative findings are supported by the qualitative findings where respondents identified low awareness about LMS functionalities as one of the major barriers affecting LMS utilization at Soroti University.

R.1 reported that: “The major barriers include inadequate training, poor internet connectivity, limited ICT infrastructure, low awareness about LMS features, and resistance to technological change among some users.” Similarly, R.5 observed that: “Challenges include limited ICT skills, poor internet connectivity, inadequate awareness about LMS functionalities, and continued preference for traditional classroom teaching.

These findings confirm that limited awareness about LMS features significantly affects effective usage of the system.

On assessing the quality, relevance, and accuracy of information as factors affecting LMS usage, 8 (20%) strongly agreed and 17 (42.5%) agreed with the same belief, whereas 10 (25%) were not sure whether information quality was a major factor affecting LMS usage. However, 3 (7.5%) disagreed and 2 (5%) strongly disagreed with the notion that information quality could affect LMS usage at SUN.

The qualitative findings support these results, where respondents emphasized the importance of quality digital learning resources and effective information literacy competencies in enhancing LMS usage.

R.4 explained that: “Some students experience challenges in identifying credible academic sources, searching scholarly databases, and properly evaluating online information.”

This suggests that the relevance, credibility, and quality of information available through the LMS influence users’ ability to effectively utilize the platform.

As far as lack of training and technical support as a factor affecting LMS usage is concerned, 12 (30%) strongly agreed and 8 (20%) agreed with the same statement. However, 7 (17.5%) were not sure and another 7 (17.5%) disagreed that lack of training and technical support was a major factor affecting LMS usage, while 6 (15%) strongly disagreed with the same notion.

These findings are reinforced by the qualitative responses, where respondents consistently emphasized inadequate training and insufficient technical support as major barriers to LMS utilization.

R.1 stated that: “The major barriers include inadequate training, poor internet connectivity, limited ICT infrastructure, low awareness about LMS features, and resistance to technological change among some users.” Likewise, R.2 noted that: “The key barriers include unreliable internet connectivity, inadequate ICT equipment, intermittent power supply, and insufficient technical support personnel.” Similarly, R.4 pointed out that: “The major challenges include

limited orientation training, inadequate digital literacy skills, unstable internet access, and limited technical support for off-campus learners."

These findings clearly demonstrate that continuous training and responsive technical support are necessary for effective LMS utilization.

Regarding preference for the traditional method of teaching and learning over LMS usage, 8 (20%) strongly agreed while 16 (40%) agreed that preference for traditional teaching methods is a major factor affecting LMS usage at SUN. However, 3 (7.5%) were not sure, 6 (15%) disagreed, and 7 (17.5%) strongly disagreed that preference for traditional teaching methods hinders LMS usage.

The qualitative findings support these responses, where respondents highlighted resistance to technological change and continued preference for traditional classroom teaching as major challenges affecting LMS adoption. R.1 observed that resistance to technological change among some users limits LMS utilization.

Similarly, R.5 stated that: "Challenges include limited ICT skills, poor internet connectivity, inadequate awareness about LMS functionalities, and continued preference for traditional classroom teaching."

These findings explain why some users still prefer conventional face-to-face teaching approaches instead of adopting LMS-based learning.

To further assess respondents' attitudes towards LMS usage as a hindering factor, 6 (15%) strongly agreed and 17 (42.5%) agreed that users' attitudes significantly hinder LMS usage. However, 5 (12.5%) were not sure, while 8 (20%) disagreed and 4 (10%) strongly disagreed with the same notion.

The qualitative findings equally support these results. R.1 explained that resistance to technological change among some users remains one of the barriers affecting LMS usage. This implies that negative attitudes, fear of technological change, and reluctance to adopt digital learning platforms continue to affect effective LMS utilization at Soroti University.

From this study, system quality in terms of interface and interactivity was also identified as a hindrance to LMS usage, whereby 3 (7.5%) strongly agreed and 14 (35%) agreed with the statement. However, 12 (30%) were not sure whether system quality in terms of interface and interactivity was a hindrance, while 6 (15%) disagreed and 5 (12.5%) strongly disagreed with the assertion.

The qualitative findings support these results, where respondents highlighted challenges related to ICT infrastructure, bandwidth optimization, server capacity, and technical support.

R.2 explained that: "The key barriers include unreliable internet connectivity, inadequate ICT equipment, intermittent power supply, and insufficient technical support personnel."

These infrastructural limitations may negatively affect system quality, user interaction, and overall LMS effectiveness

The strategies to maximize LMS usage at Soroti University

In a bid to understand LMS utilization at SUN and develop possible mechanisms for maximizing its usage, the responses presented in Table 6 clearly point to several major strategies. It is worth noting that 28 (70%) of the respondents strongly agreed and 8 (20%) agreed that creating awareness and training intended users on LMS is an important strategy for maximizing LMS usage at SUN. However, 1 (2.5%) disagreed, and 3 (7.5%) strongly disagreed with the same notion.

The quantitative findings are strongly supported by the qualitative findings, where respondents consistently emphasized the importance of continuous awareness creation and user training in enhancing LMS utilization.

R.1 recommended that: “Regular user training, awareness campaigns, reliable internet access, improved technical support, and establishing an LMS helpdesk would significantly improve utilization and user confidence.” Similarly, R.4 suggested that: “The University should integrate mandatory information literacy and LMS training into postgraduate orientation programs and strengthen continuous technical support services.”

Table 6: Showing the perspective strategies to maximize LMS usage at Soroti University

Perspective strategy	SA	%	A	%	NS	%	D	%	SD	%
Create awareness and train intended users on LMS	28	70.0	08	20.0	00	00.0	01	02.5	03	07.5
Developing and uploading quality learning materials	20	50.0	15	37.5	02	05.0	00	00.0	03	07.5
Having policy frameworks that foster the use of LMS in users	16	40.0	18	45.0	03	07.5	00	00.0	03	07.5
Make LMS interface more user-friendly and interactive	19	47.5	17	42.5	02	05.0	02	05.0	00	00.0
Avail competent personnel to manage and maintain the LMS	21	52.5	14	35.0	02	05.0	01	02.5	02	05.0

SA= Strongly Agree, A= Agree, NS= Not Sure, D= Disagree, SD= Strongly Disagree

Source: *(Primary source, 2025)*

These findings indicate that awareness creation and regular training programs are essential in improving users’ confidence and competence in LMS usage.

Developing and uploading quality learning materials was also considered a key strategy, with 20 (50%) of the respondents strongly agreeing and 15 (37.5%) agreeing with the same statement, whereas 2 (5%) were not sure and 3 (7.5%) strongly disagreed.

The qualitative findings support these responses, where respondents emphasized the importance of quality digital learning resources in promoting effective teaching and learning through the LMS.

R.3 observed that: “The LMS is highly relevant because engineering education increasingly relies on digital simulations, online instructional materials, and blended learning approaches.”

This finding suggests that the availability of relevant and quality instructional materials can enhance users’ engagement and improve LMS utilization.

Regarding the establishment of policy frameworks that foster the use of LMS among users, 16 (40%) strongly agreed and 18 (45%) agreed with the same notion, whereas 3 (7.5%) were not sure and another 3 (7.5%) strongly disagreed with the idea of having policy frameworks that support LMS usage at SUN.

These findings are supported by the qualitative responses where respondents highlighted the importance of institutional support in promoting effective LMS integration.

R.3 noted that: “Continuous ICT and information literacy training, improved digital infrastructure, and institutional encouragement for blended learning would improve LMS integration.”

This implies that institutional policies and supportive frameworks are necessary in encouraging adoption and effective utilization of the LMS.

In regard to making the LMS interface more user-friendly and interactive as a strategy for enhancing LMS usage at SUN, 19 (47.5%) strongly agreed and 17 (42.5%) agreed with the same statement, whereas 2 (5%) were not sure and another 2 (5%) disagreed with the strategy.

The qualitative findings equally support these results. Respondents emphasized the need to improve technical support systems and digital infrastructure to make the LMS more accessible and easier to use. R.1 recommended improving technical support and establishing an LMS helpdesk to improve user confidence and system usability.

Similarly, R.2 emphasized that: “The university should invest in stronger ICT infrastructure, improve internet reliability, increase access to computers, and provide continuous digital literacy training.”

These findings suggest that improving system interface, interactivity, and infrastructure would contribute significantly to enhanced LMS usage.

To further understand whether availing competent personnel to manage and maintain the LMS would be an effective strategy, 21 (52.5%) strongly agreed and 14 (35%) agreed with the same notion. However, 2 (5%) were not sure, 1 (2.5%) disagreed, and 2 (5%) strongly disagreed

Correlation analysis

Table 7: The relationship between variables using Pearson correlations

		Status of LMS	Literacy Level	Usage of LMS	Improvement of LMS
Status of LMS	Pearson Correlation	1	.729**	.174	.304
	Sig. (2-tailed)		.000	.282	.060
	N	40	40	40	39
Literacy Level	Pearson Correlation	.729**	1	-.011	.343*
	Sig. (2-tailed)	.000		.947	.032
	N	40	40	40	39
Usage of LMS	Pearson Correlation	.174	-.011	1	.038
	Sig. (2-tailed)	.282	.947		.820
	N	40	40	40	39
Improvement of LMS	Pearson Correlation	.304	.343*	.038	1
	Sig. (2-tailed)	.060	.032	.820	
	N	39	39	39	39

**. Correlation is significant at the 0.01 level (2-tailed).
*. Correlation is significant at the 0.05 level (2-tailed).

mixed relationships among the status of LMS, literacy level, LMS usage, and LMS improvement at SUN. A strong and statistically significant positive relationship existed between LMS status and literacy level

(r = .729, p = .000), indicating that a better LMS supports higher information literacy skills. Literacy level also had a significant positive relationship with LMS improvement (r = .343, p = .032), suggesting that improved information literacy contributes to better LMS development and effectiveness. However, the relationships between LMS status and LMS usage (r = .174, p = .282), LMS status and LMS improvement (r = .304, p = .060), literacy level and LMS usage (r = -.011, p = .947), as well as LMS usage and LMS improvement (r = .038, p = .820) were all statistically insignificant. These findings imply that although information literacy is important for LMS improvement, actual LMS usage may depend more on other factors such as ICT infrastructure, internet accessibility, technical support, and user attitudes toward technology

Table 8: Showing the relationship between Literacy Level and Status of LMS

Model	R	R-Square	Adjust R Square	Standard Error of Estimate
1	.729[a]	.531	.519	.67330

a. Predictors: (Constant), Literacy Level

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.477	.310		1.539	.132
Literacy Level	.734	.112	.729	6.563	.000

a. Dependent Variable: Status of LMS

The study findings in table 8 above reveal that information literacy has a strong and statistically significant positive influence on Learning Management System (LMS) utilization at SUN. A high correlation coefficient (R = .729) indicates that users with higher information literacy levels tend to utilize the LMS more effectively. The regression model explains 53.1% of the variation in LMS utilization (R^2 = .531), showing that information literacy is a major determinant of LMS usage, although other factors such as ICT infrastructure, internet access, technical support, and institutional policies also contribute. The adjusted R^2 (.519) and low standard error (.67330) confirm the reliability and good fit of the model. Additionally, the regression coefficient shows that a one-unit increase in information literacy results in a 0.734 increase in LMS utilization, with the relationship being highly significant (p = .000; t = 6.563). Overall, the study concludes that strengthening information literacy through training, awareness creation, and digital skills development would significantly improve effective LMS utilization at SUN.

Table 9: Showing the relationship between Literacy Level and Usage of LMS

Model	R	R-Square	Adjust R Square	Standard Error of Estimate
1	.011[a]	.000	-.026	.83223

a. Predictors: (Constant), Literacy Level

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	2.674	.383		6.986	.000
Literacy Level	-.009	.138	-.011	-.067	.947

a. Dependent Variable: Usage of LMS

The findings presented in Table 9 indicate that there is no significant relationship between information literacy level and Learning Management System (LMS) usage at SUN. The very weak correlation coefficient (R = .011) suggests that changes in information literacy levels are not associated with meaningful differences in LMS usage among respondents. Similarly, the coefficient of determination (R^2 = .000) shows that information literacy explains virtually none of the variations in LMS usage, while the negatively adjusted R^2 (-.026) further indicates that the regression model has poor predictive ability and does not fit the data well. Regression analysis also reveals a very small negative effect of literacy level on LMS usage (B = -.009), but this relationship is statistically insignificant, since the p-value (.947) is far above the acceptable significance level of 0.05. In addition, the standardized beta coefficient (β = -.011) and t-value (-.067) confirm that information literacy level does not significantly predict LMS usage. Overall, the study concludes that information literacy is not a major factor influencing LMS usage at SUN; instead, factors such as ICT infrastructure, internet accessibility, technical support, user attitudes, system quality, and institutional support are likely to play a more important role in determining LMS utilization.

Table 10: Showing the relationship between Literacy Level and Improvement of LMS

Model	R	R-Square	Adjust R Square	Standard Error of Estimate
1	.343[a]	.118	.094	.89787

a. Predictors: (Constant), Literacy Level

Coefficients[a]

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.853	.415		2.058	.047
Literacy Level	.332	.149	.343	2.224	.032

a. Dependent Variable: Improvement of LMS

The findings in Table 10 indicate that information literacy level has a moderate positive and statistically significant influence on the improvement of the Learning Management System (LMS) at SUN. The correlation coefficient (R = .343) shows that higher information literacy levels are associated with better LMS effectiveness and improvement. The model explains 11.8% of the variation in LMS improvement (R^2 = .118), while the remaining variation is influenced by other factors outside the study. Regression results further reveal that a one-unit increase in information literacy level leads to a .332-unit increase in LMS improvement, and this relationship is statistically significant (p = .032). The positive beta coefficient (β = .343) and t-value (2.224) confirm that literacy level contributes positively to LMS improvement. The findings suggest that although LMS improvement can still occur due to other factors, strengthening users' information literacy through digital literacy training, awareness creation, and capacity-building programs can significantly enhance LMS effectiveness and user engagement at Soroti University.

Discussion of the findings

The findings showed that the LMS at SUN is operational and widely recognized by both staff and students. Respondents confirmed that the LMS supports teaching and learning through access to digital instructional materials and blended learning approaches. These findings are consistent with studies by Al-Rahmi et al. (2019), Chen et al. (2012), Choi and Jacobs (2016), and Johnson and Watson (2018), which found that LMS platforms enhance access to educational resources, online interaction, and student engagement through digital learning materials.

The perspectives presented by R.5 that the library provides access to electronic resources further underscore the critical role of academic libraries in supporting digital learning through user education, information literacy instruction, guidance on accessing electronic resources, and continual digital skills training.

The information literacy levels of users in using the LMS at Soroti University

The results indicated that information literacy has a significant effect on the effective utilization of LMS at SUN. The more competent respondents were in accessing, searching, evaluating and organizing information, the better they were able to interact with the digital learning resources using the LMS. These findings are consistent with the studies of Choi and Jacobs (2011) and Johnson and Watson (2018) that link information literacy with effective

participation in digital learning environments. But, in contrast to studies that show that information literacy is adequate for successful LMS use, the current study revealed that even though users were aware of resources in the LMS, they still experienced challenges. This suggests that information literacy alone may not guarantee effective LMS utilization without complementary support such as user orientation, technical assistance, and reliable ICT infrastructure. The observations of R.5 further indicate that variations in users' ability to utilize academic databases and digital resources remain a challenge. From the LIS perspective, these findings highlight the contribution of the Information Literacy course unit and library-supported user education programs in strengthening users' capacity to engage with LMS resources. They also reinforce the ACRL Framework (2016), which emphasizes the development of competencies for evaluating and ethically using information in digital environments.

Challenges affecting the usage of LMS at Soroti University

The study identifies several barriers to the effective use of the Learning Management System (LMS) at SUN, including inadequate training, limited awareness of its functionalities, poor technical support, and insufficient ICT infrastructure. While previous studies by Chen et al. (2012) and Al-Rahmi et al. (2019) emphasized technological and institutional challenges, this study highlights user-related factors such as low information literacy and resistance to change as significant influences on LMS utilization. It concludes that addressing infrastructure issues alone may not suffice to enhance LMS effectiveness.

The study further highlights that the acceptance of the LMS is shaped by user attitudes, perceptions of usability, and a preference for traditional teaching methods. Key factors influencing LMS acceptance include accessibility and ease of use. Additionally, the persistent preference for face-to-face teaching underscores a need for continuous user engagement and development activities to facilitate effective LMS integration. Ongoing information literacy instruction, user education programs, and collaboration between the university library, ICT unit, and academic departments are essential for enhancing users' skills in digital learning environments from a Library and Information Science (LIS) perspective.

Strategies for improving LMS usage at Soroti University

The study highlights that continuous training, user orientation, and awareness are crucial for enhancing the use of LMS at SUN. While training and technical support are important for adoption (Chen et al., 2012), the findings suggest that training alone does not ensure effective use. Information literacy was identified as significant; however, there was no substantial link to actual LMS usage, implying that contextual factors like infrastructure and institutional support might influence the effectiveness of training.

The study also highlights the importance of quality learning materials, supportive policies, competent personnel, reliable internet, and user-friendly LMS design for effective utilization. Respondents prioritized infrastructure and technical support over system features, suggesting that in resource-constrained contexts like Uganda, a holistic approach is needed, which includes continuous training, library-led digital literacy, improved ICT infrastructure, and institutional policies to promote blended learning.

Conclusions

The study concluded that the Learning Management System (LMS) at SUN is operational and supports teaching, learning, and access to digital resources. However, challenges such as poor internet connectivity, limited ICT infrastructure, inadequate technical

support, and uneven utilization across departments continue to affect its effectiveness.

The findings further established that information literacy significantly influences LMS utilization. Users with stronger information literacy skills were better able to access, evaluate, organize, and use digital learning resources. Statistical analyses suggest a strong positive relationship between information literacy and effective LMS utilization, showing that an improved information literacy program rendered by the library professionals enhances users' engagement with digital learning platforms.

The study also identified key barriers to LMS utilization, including limited awareness of LMS functions, insufficient training, negative user attitudes, inadequate infrastructure, and continued reliance on traditional teaching methods. These challenges reduce users' confidence and effective participation in digital learning.

The study contributes to the field of education leadership and management by highlighting the importance of institutional support, information literacy, ICT infrastructure, and continuous training in successful LMS implementation. It concludes that strengthening information literacy programs, technical support, institutional policies, and digital infrastructure is essential for sustainable and effective LMS integration in higher education institutions.

Recommendations

Based on the findings from the study, the following recommendations were made by the researchers.

1. From the results, it was noted that respondents knew about the LMS but could not exhaustively and comprehensively utilize the LMS resources to their full potential. The university library should therefore strengthen continuous user education and digital literacy training aimed at improving students' and lecturers' competencies in accessing, evaluating, and utilizing digital academic resources through the LMS.
2. The University Library should strengthen its role in supporting LMS utilization through library-led information literacy programs, digital literacy workshops, user support services, and integration of information literacy instruction into student orientation and academic programs.
3. The university should put in place continuous group mentorship of LMS users for both students and staff. This may involve grouping members according to their specific challenges and interests in the LMS.
4. University management should devise a reward mechanism as a motivation to lecturers for the best course(s) developed and uploaded on the LMS.
5. Systems administrators should enhance frequent communication with LMS users through the various platforms, such as WhatsApp groups, List Serve, Google Meet, among others
6. Set up an LMS helpdesk to always receive and respond to queries and inquiries about the LMS and its associated resources.

Implication to Practice

The findings have important implications for Library and Information Science (LIS) practice and academic library services in higher education. The positive relationship between information literacy and LMS effectiveness highlights the strategic role of academic libraries in supporting digital learning environments. Libraries can no longer be viewed solely as providers of information resources but also as key partners in developing the competencies required for effective use of digital learning platforms.

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