

Enhancing Student Engagement Through MOODLE in Blended Learning: Evidence from Higher Education Institutions in Sierra Leone

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ABSTRACT: This study explores the role of MOODLE, an open-source learning management system, in enhancing student engagement within blended learning environments in Sierra Leone's higher education institutions. Drawing on data from the University of Sierra Leone (IPAM), the University of Lunsar, and Milton Margai Technical University (MMTU), the research employs a mixed-methods approach combining surveys and in-depth interviews. Quantitative findings indicate high usage of MOODLE for accessing materials and assessments, but limited engagement with interactive features such as forums. Qualitative insights highlight how institutional context shapes digital engagement: IPAM students benefited from greater flexibility and inclusivity, while students at the University of Lunsar faced infrastructural and pedagogical barriers. Thematic analysis identifies key dimensions of engagement including self-paced learning, empowerment of shy students, and challenges linked to connectivity, content design, and instructor presence. The study concludes that while MOODLE has the potential to support active learning, its effectiveness depends on pedagogical integration, institutional capacity, and digital infrastructure. Recommendations include targeted training for staff, improved connectivity, and localized instructional design to promote deeper, more equitable student engagement.

Keywords: *MOODLE, blended learning, student engagement, higher education, Sierra Leone, digital pedagogy*

INTRODUCTION

Blended learning is an instructional strategy that combines traditional face-to-face teaching with online components has gained global prominence in addressing pedagogical and infrastructural challenges in higher education. Central to this shift is the adoption of Learning Management Systems (LMS) like MOODLE, an open-source platform widely used for facilitating digital learning experiences. MOODLE allows students to access course materials, engage in discussions, complete assessments, and receive feedback asynchronously or in real time (Moodle, 2022; Francescucci & Rohani, 2018). In the Global South, particularly in resource-constrained contexts like Sierra Leone, the strategic integration of MOODLE holds transformative potential in enhancing educational access, flexibility, and student engagement.

Despite global validation of MOODLE's pedagogical utility (Al-Ajlan & Zedan, 2008), its contextual effectiveness in Sierra Leone remains underexplored. Institutions such as the University of Sierra Leone (USL), Milton Margai Technical University (MMTU), and the University of Lunsar have taken initial steps toward MOODLE integration, but empirical data on its impact is sparse. This article focuses on one key dimension of MOODLE's use: its influence on student engagement in blended learning environments.

Problem Statement

While MOODLE is globally endorsed as a cost-effective and scalable platform to support blended learning, its deployment in Sierra Leone faces significant limitations. These include infrastructural deficiencies, low digital literacy among students and lecturers, and institutional unpreparedness (Mtebe & Raisamo, 2016; Dakowska, 2017). More critically, the role of MOODLE in actively enhancing student engagement as a key predictor of academic success and retention is not yet well understood in this context.

In institutions such as IPAM and the University of Lunsar, anecdotal reports suggest that while MOODLE is accessed for basic academic tasks, its interactive features remain underutilized. Moreover, engagement patterns vary widely, influenced by connectivity, device ownership, and prior exposure to digital platforms. There is thus a critical need to assess whether and how MOODLE facilitates active student engagement within Sierra Leone's higher education landscape.

Objective

To assess MOODLE's effectiveness in raising student engagement in mixed learning environments within selected higher education institutions in Sierra Leone.

Literature Review

Blended Learning and Student Engagement

Student engagement is defined as the level of attention, curiosity, and active involvement students exhibit during learning activities (Fredricks, Blumenfeld, & Paris, 2004). Blended learning—by design—offers multiple pathways for engagement through its flexibility and interactivity. Research suggests that platforms like MOODLE promote both behavioral and cognitive engagement by enabling students to access content at their own pace, collaborate with peers, and receive timely feedback (Garrison & Kanuka, 2004; Al-Ajlan & Zedan, 2008).

However, the success of blended learning depends on more than the availability of technology. Learners' digital competencies, instructors' pedagogical skills, and institutional support structures all shape the quality of engagement (Fresen, 2010; Clark & Mayer, 2016). In resource-constrained settings, infrastructural barriers such as poor internet connectivity and limited device access often constrain engagement, even where MOODLE is technically available (Tawiah et al., 2019; Mtebe & Raisamo, 2016).

MOODLE as an Engagement Tool

MOODLE offers multiple engagement features including forums, quizzes, real-time chats, multimedia content, and feedback mechanisms (Moodle, 2020). When used

effectively, these tools can foster student autonomy, collaborative learning, and sustained participation. Yet, studies in sub-Saharan Africa indicate mixed outcomes. For example, in Ghana, Tawiah et al. (2019) found that students primarily used MOODLE for downloading materials and submitting assignments, with minimal interaction in discussion forums. Similar patterns have been noted in South Africa, where asynchronous engagement is limited by poor network infrastructure (Mtebe & Raisamo, 2016).

In Sierra Leone, the digital education landscape remains emergent. Universities are transitioning from traditional, instructor-centered pedagogy toward learner-centered approaches facilitated by technology. However, limited research has investigated the pedagogical use of MOODLE to enhance engagement, particularly within the framework of localized digital constraints and educational culture.

In addition to facilitating asynchronous access to course materials, MOODLE has been found to contribute to differentiated learning by enabling instructors to customize content and pace according to learner needs. This personalization enhances engagement by allowing students to navigate their own learning paths, especially in diverse classrooms with varying academic preparedness (Wang, Han, & Yang, 2015). Moreover, MOODLE's ability to integrate multimedia elements—such as instructional videos, audio lectures, and infographics—has been shown to support multimodal learning preferences, leading to greater learner satisfaction and motivation (Bälter, Enström, & Klingenberg, 2013). However, these benefits are contingent upon the digital proficiency of both students and faculty, as well as institutional commitment to maintaining and updating the platform's features.

Furthermore, the role of MOODLE in promoting collaborative learning has received mixed assessments in the literature. While the platform offers tools such as forums, wikis, and peer-assessment modules that can enhance social presence—a key element in the Community of Inquiry framework (Garrison, Anderson, & Archer, 2000)—studies show that these tools are often underutilized, particularly in low-resource settings (Mtebe & Raisamo, 2014). For example, research in Tanzanian and Ugandan universities revealed that while students appreciated the asynchronous flexibility of MOODLE, engagement in peer discussion forums was limited due to

poor internet access, inadequate training, and low intrinsic motivation (Nkuyubwatsi, 2016). These findings are consistent with preliminary results from Sierra Leone, where despite widespread access to MOODLE's core features, interaction levels remain low. This suggests that for MOODLE to truly foster engagement, a stronger emphasis must be placed on the pedagogical design of courses, including structured discussion activities and instructor presence.

Methodology

Design

This study adopted a **sequential explanatory mixed-methods** approach, integrating quantitative survey data and qualitative interviews. The data was collected from students and lecturers at the University of Sierra Leone (IPAM), the University of Lunsar, and Milton Margai Technical University (MMTU).

Sampling

The sample comprised undergraduate students ($N > 40$) and academic staff members ($N > 20$) across multiple faculties. Institutions were selected to represent both early and late adopters of MOODLE in Sierra Leone.

Data Collection

Quantitative data was gathered through structured questionnaires assessing frequency of MOODLE use, types of activities, perceived engagement, and challenges.

Qualitative data was derived from in-depth interviews with students and lecturers to explore perceptions, challenges, and experiences in detail.

Analytical Framework

Data was interpreted through the **Community of Inquiry (CoI)** model, which emphasizes the interconnection between social, cognitive, and teaching presence (Garrison et al., 2000), and the **Culturo-Techno-Contextual Approach** (Mpfungu,

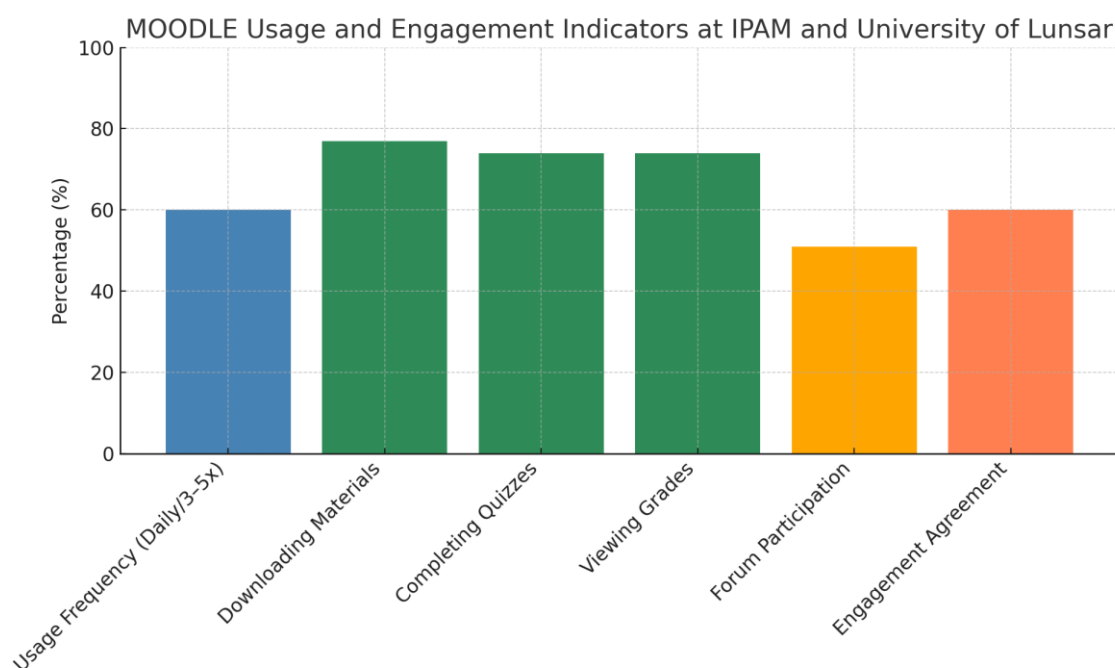
2016), which considers cultural and infrastructural realities in digital learning environments.

Findings and Discussion: MOODLE and Student Engagement

Quantitative Findings

Graph Representing of MOODLE Usage and Engagement

This graph consolidates key indicators of student interaction with the MOODLE platform at IPAM and the University of Lunsar. It illustrates frequency of usage, engagement in various platform activities, and perceived involvement in learning.



The graph provides a visual synthesis of six core indicators reflecting students' interaction with the MOODLE learning platform at the Institute of Public Administration and Management (IPAM) and the University of Lunsar. The indicators include usage frequency, key learning activities, and self-reported engagement perceptions. This integrated representation allows for a holistic understanding of how digital platforms are currently supporting blended learning in postsecondary institutions in Sierra Leone.

1. Frequency of Usage

The graph indicates that **60% of students** use MOODLE either daily or 3–5 times per week. This level of consistent usage suggests that the platform has been well integrated into students' academic routines. Regular access aligns with literature on technology adoption in education, where frequency of use is a strong predictor of digital learning acceptance and perceived usefulness (Davis, 1989; Venkatesh et al., 2003). However, the data also implies that 40% of the student population uses the platform less frequently, possibly due to challenges such as unstable internet access, lack of devices, or insufficient digital skills, as found in similar African contexts (Tadesse & Muluye, 2020).

2. Academic Activities on MOODLE

Student engagement in specific academic activities presents further insight. The highest recorded activity is **downloading course materials (77%)**, followed closely by **completing quizzes (74%)** and **viewing grades (74%)**. These figures suggest that students predominantly use MOODLE for content consumption and assessment-related tasks. Such behavior is typical in systems where digital platforms are used to replicate traditional instructional models, emphasizing teacher-delivered content over constructivist learning strategies (Means et al., 2014).

In contrast, **forum participation lags behind at 51%**, indicating relatively low levels of student-to-student interaction. This trend reflects a missed opportunity in leveraging the platform's interactive features to promote collaborative and dialogical learning. From a pedagogical standpoint, this limitation may hinder the development of higher-order thinking skills and peer-supported learning elements vital for critical engagement in tertiary education (Laurillard, 2012).

3. Perceived Engagement and Motivation

Interestingly, **60% of respondents** reported that MOODLE helped keep them involved in their learning. While this signals a moderate level of platform effectiveness, it also implies that **a significant 40%** did not experience improved

engagement. This ambivalence may be attributed to factors such as uninspiring instructional design, poor internet connectivity, or a lack of interactivity in course materials. According to Garrison and Vaughan's (2008) community of inquiry model, meaningful engagement in blended environments requires cognitive presence, social presence, and teaching presence—all of which depend on how well the platform is utilized.

Qualitative Findings and Thematic Analysis Across Institutions

This section presents the thematic analysis of qualitative data drawn from student interviews conducted at two tertiary institutions in Sierra Leone: the **Institute of Public Administration and Management (IPAM)** and the **University of Lunsar**. The participants' reflections on MOODLE use illuminated four key themes: *flexibility, empowerment of shy students, interactivity, and barriers*. The integration of institutional context provides deeper insight into the digital learning experiences shaped by institutional support structures and learner environments.

Theme 1: Flexibility – Enabling Self-Paced Learning (IPAM)

Flexibility stood out as a recurring strength of the MOODLE platform, especially for students managing competing priorities. A respondent from IPAM (R1) remarked: *“MOODLE allows for self-paced learning, which helps me engage with materials more deeply.”*

This suggests that IPAM students benefited from the platform's asynchronous learning structure, which aligns with global findings on the affordances of Learning Management Systems (LMSs) in promoting learner autonomy (Laurillard, 2002; Mayer, 2001). The ability to access materials outside the constraints of a physical classroom allowed students to overcome time and space limitations. This was particularly significant in urban settings like Freetown, where IPAM is situated, and where infrastructural and scheduling demands may be more intense than in semi-rural campuses like the University of Lunsar.

Theme 2: Empowerment of Shy or Less Vocal Students (IPAM)

The theme of student empowerment, particularly among shy or less vocal learners, was also strongly expressed by IPAM participants. R3 explained: *“Students who were hesitant in class are more expressive online.”*

This insight is crucial in understanding how MOODLE reshapes classroom dynamics and democratizes participation. At IPAM, where class sizes may be large and lecture-based delivery common, the online space provides an alternative avenue for students to engage without social pressure. This finding resonates with Hrastinski (2008) and hooks (1994), who argue for the pedagogical power of asynchronous forums in empowering silenced voices and enhancing inclusive participation. The affordances of MOODLE, therefore, extend beyond content delivery to include meaningful social and cognitive engagement for diverse learners.

Theme 3: Interactivity – Balancing Engagement and Cognitive Load (University of Lunsar)

At the University of Lunsar, respondents highlighted interactivity as a double-edged feature of the MOODLE platform. R2 noted: *“Quizzes and forums enhance engagement, but long videos can hinder it.”*

This observation draws attention to the importance of instructional design in sustaining learner engagement. While interactive tools such as quizzes were praised for their reinforcement of learning and immediate feedback, lengthy and poorly segmented video lectures were seen as burdensome. These findings suggest that although digital pedagogy is in use at Lunsar, instructional staff may require more training in chunking content and aligning multimedia with learner attention spans, particularly in resource-constrained environments. Mayer’s (2001) theory of multimedia learning supports this concern by emphasizing the need for coherent, concise delivery of digital instructional material.

Theme 4: Barriers – Technical, Pedagogical, and Institutional Limitations (University of Lunsar)

The most robust concerns came from students at the University of Lunsar, who emphasized multiple barriers that inhibit full engagement with MOODLE. R6 expressed:

“Forums are useful, but poor moderation and technical glitches reduce interest.”

Students at Lunsar appeared to experience more severe infrastructural and pedagogical limitations compared to their IPAM counterparts. Challenges included inconsistent electricity supply, poor internet access, lack of instructor feedback, and a limited capacity for technical troubleshooting. These issues are compounded by limited staff-to-student ratios and minimal institutional investment in e-learning support. This underscores the critical need for local capacity building and institutional frameworks that support not just access to digital platforms, but their effective use (Unwin et al., 2020).

Interestingly, while both universities faced barriers, the University of Lunsar students appeared more affected by structural constraints, while IPAM students voiced concerns more centered on pedagogical practices (e.g., content format, feedback delays).

Cross-Institutional Reflection

A comparison of the findings across institutions reveals how infrastructural and institutional context mediates students' engagement with digital learning platforms. **At IPAM**, flexibility and inclusivity were more pronounced, partly due to relatively better access to devices and urban connectivity. MOODLE served as an empowering space for less vocal students and allowed for self-paced learning in a fast-paced urban environment.

At the University of Lunsar, while interactivity was valued, infrastructural deficiencies and insufficient pedagogical support limited the platform's effectiveness. The Lunsar experience highlights how socio-economic and geographical factors

shape the utility of digital tools and amplify digital divides, even within the same national education system.

These findings reinforce the notion that technology alone is not a panacea. The pedagogical value of platforms like MOODLE depends on contextual responsiveness, capacity-building, and institutional commitment to inclusive and effective e-learning strategies.

Discussion of the Findings

The findings reveal that while MOODLE is accessible and moderately used across Sierra Leonean tertiary institutions, the extent to which it fosters deep student engagement is mediated by both institutional capacity and pedagogical practices. The high usage for downloading materials, quizzes, and grade-checking at IPAM and University of Lunsar supports earlier literature indicating that LMSs in low-resource contexts tend to be utilized more for administrative and assessment functions than for dialogical or collaborative learning (Tawiah et al., 2019; Mtebe & Raisamo, 2016). This pattern suggests that MOODLE is being used in a limited, transactional mode rather than as a transformative tool for learning.

The thematic analysis highlights a critical difference in the affordances and barriers experienced by students in urban (IPAM) versus semi-rural (Lunsar) contexts. At IPAM, the platform's flexibility supported learner autonomy and enabled shy students to engage more confidently, consistent with theories on learner-centered education and social presence (Hrastinski, 2008; Garrison et al., 2000). In contrast, Lunsar students reported more structural barriers, including erratic connectivity, poor content chunking, and lack of instructor presence—factors that significantly reduce the efficacy of digital learning platforms.

Importantly, the study illustrates that technological engagement is not just about access, but about **meaningful pedagogical integration**. While students appreciated self-paced learning and interactivity in quizzes, they critiqued the quality and length of multimedia content, and the underutilization of forums. These limitations point to

a need for better instructional design and institutional investment in capacity-building for faculty and students alike.

From the **Community of Inquiry (CoI)** lens, the findings demonstrate a clear gap in *teaching presence* and *social presence*, particularly at the University of Lunsar. While cognitive presence is somewhat achieved through quizzes and material downloads, the limited use of collaborative tools and minimal instructor feedback compromises the holistic learning experience envisioned in blended learning models (Garrison & Vaughan, 2008).

Conclusion

This study contributes empirical evidence to the growing discourse on blended learning in sub-Saharan Africa by analyzing MOODLE's effectiveness in engaging students within Sierra Leonean higher education institutions. The research affirms that while MOODLE provides foundational support for content access and assessment, its transformative potential remains underexploited due to infrastructural challenges, uneven digital literacy, and suboptimal instructional practices.

Students' engagement with MOODLE is significantly shaped by contextual variables, including geographical location, institutional preparedness, and pedagogical design. At present, the platform supports a narrow band of learning interactions, mostly content-related. To move beyond surface-level engagement, higher education institutions must adopt more inclusive, responsive, and pedagogically informed strategies for LMS implementation.

Recommendations

Based on the findings, the following recommendations are offered for policy makers, institutions, and practitioners:

Institutional Digital Pedagogy Training: Faculty members should be trained not only in MOODLE use but also in digital pedagogy—including instructional design, multimedia chunking, and forum facilitation—to promote deeper engagement.

Improve Technical Infrastructure: Government and institutional stakeholders must prioritize reliable internet access, device provision schemes, and campus-based ICT hubs to bridge the urban-rural digital divide.

Strengthen Instructor Presence: Institutions should implement policies requiring instructors to actively moderate forums, give timely feedback, and maintain regular virtual communication with students.

Student Digital Literacy Development: Orientation programs should include digital literacy components that prepare students to engage meaningfully with online learning environments.

Localized Adaptations of MOODLE: Consider developing lightweight, offline-compatible MOODLE plugins or apps for bandwidth-constrained areas to enhance equitable access and usage.

Ongoing Monitoring and Evaluation: Institutions should adopt continuous evaluation frameworks based on models like CoI and the Culturo-Techno-Contextual Approach to monitor student engagement and adapt strategies accordingly.

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