Moodle Learning Management System Utilization Assessment: Lenses on Its Accessibility, Security, and Usability

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Abstract: - **This study portrays the respondents' profile in assessing Moodle utilization, particularly its features, accessibility, security, and usability. This also adopted quantitative data collection and analysis methods, specifically descriptive data analysis. The data were collected thru an online survey using a researcher-made instrument, that is, the survey questionnaire from the population of the College of Education, Rizal Technological University, Philippines, with a purposive sampling for the selection of respondents. The study employed weighted mean as the tool in the statistical treatment for parts 1-2 questionnaires and Inductive/Deductive processes of qualitative thematic analysis for the part 3 questionnaire. The findings indicated that the Moodle features are for proficient users with smartphones/tablets who prefers to stay at home. Regarding the extent of** *Accessibility***, the respondents are navigating Moodle 3-5 times a week for two years. At the same time, the** *Security* **and** *Usability* **utilization of Moodle was rated as** *Likely* **by the respondents, which means that the respondents found it to be very efficient and successful. Offering training that goes beyond knowing how to use technology and addresses the effectiveness and efficiency of teaching and learning with technology is one of the recommendations for schools adopting Moodle.**

Keywords: **Assessment, Accessibility, Flexible Learning, Moodle LMS, Security, Usability**

I. INTRODUCTION

Teachers in the 21st century understand that today's students are very different from those who have come before them. As a result of their capacity for knowledge gathering, today's learners call for changes in the classroom more quickly than any previous generation. Learning Management System like Moodle provides users with on-demand access to the material, tools, training, information, and support they need to improve the relevance and effectiveness of learning using both personal and institutional technology. Learning is the process of learning new knowledge, behaviors, skills, attitudes, or preferences or changing and reinforcing ones already held. In connection with Flexible Learning [1], there are several types of flexible learning, in which educational ideas and systems emphasize giving students more choice, comfort, and personalization to suit their needs. Flexible learning, in particular, gives students options for when, where, and how learning takes place. Flexible learning strategies are frequently created using an entire spectrum of educational theories, ideologies, and techniques to give learners the chance to access knowledge and experience, offer suggestions and opinions, and communicate with teachers and other students. This could happen by utilizing online resources such as Learning Management or Virtual Learning Environments Systems, message boards, or chat rooms; they could also develop a "blended" strategy with content readily available both "face-to-face" and remotely via technology means lectures and tutorials in the classroom.

Meanwhile, the development of robust software systems known as learning management systems (LMS) to improve learning in various situations is a result of the improvements in web-based technologies [2]. The Learning Management System [3], more often known in the community of higher education institutions, is an online hub linking professors and students. It offers a way for simple sharing of educational resources or activities. Additionally, it is a portal that enables professors and students to communicate outside the classroom by participating in forums that would otherwise consume too much time allotted for classroom instruction. A typical learning management system offers an instructor or moderator to create and deliver a curriculum, oversee student interaction, and evaluate students' online performance. The learning management system provides students with interactive elements. The learning management system's primary features are threaded conversations, video conferencing, and discussion forums.

Moreover, Moodle is one of the most widely used learning management systems. Moodle is a teacher's dream tool because it integrates various resources, assessment methods, and content development tools. The usage of Moodle in secondary education is advantageous as a learning system that allows the participants to learn through interaction [4]. All teachers should be encouraged to adopt learning management systems to help students perform better in class. This study seeks to assess Moodle utilization, particularly the features and its lenses on accessibility, security, and usability.

II. THEORETICAL FRAMEWORK

The theoretical significance of this study is represented by the works of [5], who created connectivism as a new framework for comprehending learning in the digital age, and they have worked very hard to integrate technology into the curriculum in the areas of network and connectivity. [6] additionally, it contends that through distributed web-based technologies like learning management systems and other ones, the fast-paced

growth of connectivity and technology seeks to strike a balance between theory and practice. The connective framework leverages the metaphor of learning ecologies and learning networks to ensure that information is created and shared during teaching and learning.

When using digital tools to teach in the modern days, educators must examine their attitudes and ideas concerning acquiring the abilities required for engaging students. Even though a teacher's pedagogical views and attitudes toward technology may indicate that computer integration would be a proper teaching strategy, the teacher must have confidence in their ability to deploy technology to act on those beliefs successfully.
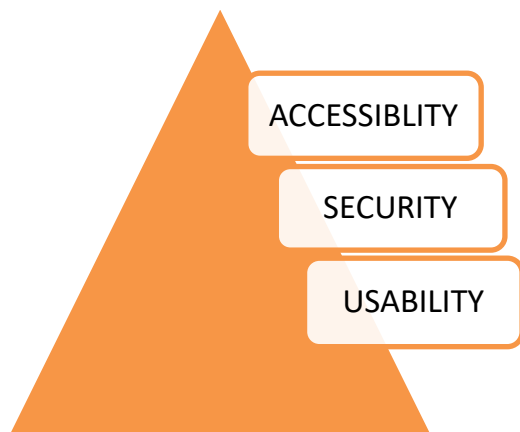
CONCEPTUAL FRAMEWORK

Figure 1: Moodle Learning Management System (Lms) Utilization Assessment: Lenses On Its Accessibility, Security, And Usability

III. METHODOLOGY

Research Design, Population, and Sampling

This study adopted quantitative data collection and analysis methods, specifically descriptive data analysis. Data in this study were collected thru an online survey using a researcher-made instrument, that is, the survey questionnaire, from the population of College of Education, Rizal Technological University, Philippines, with a purposive sampling for the selection of several respondents.

Statistical treatment and Data Analysis

The study employed weighted mean as the tool in the statistical treatment of parts 1-2, while inductive/deductive processes of qualitative thematic analysis [7] were followed for the part 3 questionnaires. To prevent the data analysis from being weakened by the loss of meaning through transcription, the data produced by all three instruments were recorded rather than transcribed but directly and openly coded from the recorded source. To link codes to categories, open coding was employed. To create themes, deductively mapped the codes onto categories taken from the theoretical framework and the literature were used [8].

IV. RESULT AND DISCUSSION

Moodle LMS Features Utilization

TABLE 1: MOODLE FEATURES

Question	Weighted Mean	Qualitative Interpretation
1. Announcement design and setup	3.37	Proficient
2. Assignment design and setup	3.13	Proficient
3. Attendance design and setup	4	Expert
4. Discussion design and setup	3.49	Proficient
5. Grade setup	2.38	Average
6. Quiz design and setup	3.30	Proficient
7. Setting	3.50	Proficient
Grand Weighted Mean	3.31	Proficient

1.00-1.49 Beginner, 1.50-2.49 Average, 2.50-3.49 Proficient, 3.50-4.00 Expert

Table 1 presents the Moodle features such as the design and setup, specifically announcement, assignment, attendance, discussion, grade, quiz, and setting. Attendance design and setup got the highest (WM=4, QI=Expert); next is the setting with a (WM=3.50, QI=Proficient). In contrast, the grade setup got the lowest (WM=2.38, QI=Average). This implies that the respondents assessed the Moodle features as proficient with a grand weighted mean of 3.31. Indeed, you can find a solution by utilizing the resources offered by the learning management system Moodle. They were providing a quick evaluation of students' work. A test module with multiple functions is part of this online learning system. The "question Bank" [9] handles test questions. For immediate, automatic task verification and evaluation, as well as automatic statistical analysis of the test and its components, Moodle provides a wide range of tools [10]. The course's task, forum, and wiki components are also used for assessment. The teacher decides how students display their work by giving them a lesson in Moodle.

Utilization of Accessibility

TABLE 2-A: EXTENT OF ACCESSIBILITY

Question	Description
2.A.1 Year in using Moodle LMS?	2
2.A.2 How frequently do you use Moodle on a weekly basis?	3-5 times a week
2.A.3 What device do you use to access Moodle?	Smartphone/tablet
2.A. 4 Where do you mostly access Moodle?	Home

Table 2-A shows that the respondents are navigating Moodle with the extent of accessibility 3-5 times a week for two years using smartphones/tablets and who prefer to stay at home. Since January 2020, Moodle has been working with an outside auditor to examine the platform as part of our ongoing commitment to provide an accessible venue and to continuously improve compliance with WCAG 2.1 Level AA. Moreover, automated technologies and user journey testing are used to audit key Moodle sites that are typical of the platform's

general accessibility and usefulness. The audit's identified WCAG 2.1 Level A and Level AA concerns were all resolved in Moodle 3.10 and Moodle 3.9.3. (both were released on November 9th, 2020). Where it was feasible, many of these accessibility updates were also retroactively applied to Moodle 3.7.5 and Moodle 3.8.2 [11].

Utilization of Security

TABLE 2-B: EXTENT OF SECURITY

Question	Weighted Mean	Qualitative Interpretation
2.B.1 Protects information	3.11	Likely
2.B.2 Restrictions	3.39	Likely
2.B.3 Prevent modification by an unauthorized user.	2.55	Likely
2.B.4 Hide user identity	3.14	Likely
Grand Weighted Mean	3.05	Likely

1.00-1.49 Very Unlikely, 1.50-2.49 Unlikely, 2.50-3.49 Likely, 3.50-4.00 Very Likely

Table 2-B revealed that the respondents gave Moodle's security features a "likely" rating, indicating that the system's overall security is suitable across all its features, content, and user interface design. On the other hand, the respondents found some weaknesses in preventing modification by an unauthorized user. Moodle takes concerns about software security extremely seriously. Even though the developers spend a lot of time developing the code to avoid such issues, new vulnerabilities will occasionally be found in a project of this scale. In addition, following the Security issue development procedure, the Moodle security team collaborates with the issue reporting to find a solution to the point while keeping the problem's and solution's specifics secret until a release is made [12].

Utilization of Usability

TABLE 2-C: EXTENT OF USABILITY

Question	Weighted Mean	Qualitative Interpretation
2.C.1 User-friendly and Handy-operational.	2.36	Unlikely
2.C.2 Easy to operate and control.	3.01	Likely
2.C.3 Can be used in more than one system.	2.48	Unlikely
2.C.4 Contents can be transferred to another hardware/software.	3.40	Likely
Grand Weighted Mean	2.81	Likely

1.00-1.49 Very Unlikely, 1.50-2.49 Unlikely, 2.50-3.49 Likely, 3.50-4.00 Very Likely

Table 2-C shows that the respondents gave Moodle a "likely" rating for usability, indicating that they found it very efficient and successful. The respondents believed that Moodle, as a learning management system, met their expectations for the delivery and security of learning activities and resources. Finding the usability issues with the existing Moodle system being utilized at Rizal Technological University is one of the problems or goals of this study. The system should provide natural interactions that are intuitive to its users so that students can concentrate on their learning tasks rather than using the system. [13] emphasized the poor usability of online tools as a contributing factor to the failure of student achievement, especially in e-learning. Any software system, including the learning management system used in educational settings, must undergo usability testing. The quality of the learning management system will influence the quality of learning [14].

Suggested Additional Content/Feature

TABLE 3: THEMES AND CATEGORIES

Themes	Categories
Video lectures for additional sources	Student-centered activities, online learning lectures, learning outcomes, training, and workshops
Edmodo, Google Classroom YouTube Links for students' personal needs	Social rationale, blended learning platform, student as researcher, institutionalized connections, peer evaluations

Table 3 describes the themes and categories. This implies that in analyzing the data, an analysis of the tools for evaluating the elements of the electronic course in Moodle was conducted. According to the survey results, video lectures for additional sources of student-centered learning must be included. One of the suggestions for the schools implementing Moodle is to provide training that goes beyond teaching people how to use technology and emphasizes the effectiveness and efficiency of teaching and learning with technology. Additional tools are required to test practical training, such as social rationale, blended learning platform, and peer evaluation. Still, Moodle tools allow you to establish the primary formation of practical skills. Subsequently, Moodle provides several dynamic learning opportunities at any time and place [15] and offers mass enrollments with support for open standards, a customized dashboard, peer and self-assessment, a secure authentication method, and other features [16]. However, other choices aside from the Moodle learning management system are Edmodo, Google Classroom, and YouTube.

V. CONCLUSION

The study unveils that the Moodle features used by respondents were clearly described and fully utilized by proficient users with smartphones/tablets. For the utilization of *Accessibility*, the respondents are navigating Moodle 3-5 times a week for two years. In comparison, the *Security* and *Usability* utilization of Moodle was rated as *Likely* by the respondents, which means that the respondents found it to be very efficient and successful. Lastly, offering training that goes beyond knowing how to use technology and addresses the effectiveness and efficiency of teaching and learning with technology is one of the

recommendations for schools adopting Moodle.

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