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The Use of Modular Object-Oriented Dynamic Learning Environment (MOODLE) Learning Management System (LMS) in Learning Evaluation at SMK Brantas Karangkates

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Abstract

Purpose: This study aims to examine the implementation of technology in educational assessments, specifically using the Learning Management System (LMS) Moodle at SMK Brantas Karangkates. Traditional paper-based tests limit multimedia integration and efficient scoring, whereas online exams offer a more effective and streamlined alternative for learning evaluations.

Method: The research focuses on Moodle's implementation process, detailing steps like preparing questions, setting up quiz features, conducting exams, and managing automated scoring. Observational data and school records were used to analyze Moodle's application.

Practical Applications: Using LMS Moodle, with its multimedia and automated grading capabilities, enhances exam efficiency, accessibility, and result management. This practical approach supports schools in modernizing their assessment processes.

Conclusion: SMK Brantas Karangkates has effectively used Moodle for online exams over the past five years, showing significant improvements in assessment efficiency. This study illustrates how e-learning platforms like Moodle can support schools in adapting to technological changes in education.

Introduction

Assessment is an activity of collecting and processing information to measure students' learning achievement. The purpose of assessment can be viewed from both summative and formative functions. The summative function of assessment is to measure and evaluate the level of competency achievement of students and describe their learning outcomes, while the formative function is to diagnose students' learning difficulties, provide guidance for educators and students to improve the quality of learning, and identify strengths and weaknesses in the learning process. This information can then serve as a basis for decision-making and improvement in the learning process (Ministry of Education and Culture, 2016).

Meanwhile, quality assessment is one of the duties of educators and educational institutions. A quality assessment should refer to educational assessment standards, which include criteria regarding the scope, objectives, benefits, principles, mechanisms, procedures, and instruments for assessing students' learning outcomes that are used as a foundation in evaluating their learning achievements.

In response to the rapidly advancing technology era, education is required to adapt and utilize information and communication technology (ICT) to facilitate and improve the quality of education, learning, and assessment processes. The public's familiarity with various technology products such as computers, tablets, smartphones, and the increasingly affordable and accessible internet provides an opportunity for the education sector to leverage technological advancements so that students do not struggle to use the latest technological devices.

The use of ICT also supports the implementation of learning evaluations, as technology can aid organizers in conducting assessments, such as online exams. The use of online exams can facilitate security, simplify logistics, and enable faster evaluation of exam results, thereby reducing costs.

This study was conducted to implement an online exam system as an alternative to the existing Paper-Based Test (PBT) system. The previous exam system had shortcomings in recording students' scores, as exam results were not automatically stored on a server, requiring exam supervisors or teachers to manually record and compile exam results.

Given these issues, implementing an online exam system is essential for a more effective and efficient system. One application that can be used for online exams, which offers comprehensive features and is free to use, is the Learning Management System (LMS) Moodle. This application is accessible not only on computers but also on mobile devices.

Moodle, short for Modular Object-Oriented Dynamic Learning Environment, is a learning platform designed to provide educators, administrators, and students with a web-based learning environment focused on learners while maintaining instructional principles (social instructional pedagogy). The Moodle LMS feature that can be used for online exam activities is the quiz feature.

The quiz feature can be used to easily create various types of questions, store them in a question bank, and automatically grade and provide feedback to students. Instructors can also secure quizzes with passwords, set availability times for questions, establish time limits for exams, set limits on retakes, and present questions randomly or in sequence. With this module, instructors can more easily administer quizzes or exams through the Moodle Learning Management System (LMS) website, and students can complete the quizzes directly on a computer or smartphone.

Some of the advantages of conducting online exams using the Moodle LMS quiz module are: 1) reducing costs and effort associated with printing and distributing question and answer sheets, 2) the automatic question randomization feature in the online exam system can help minimize cheating during exams, 3) it makes it easier for students to fill in personal information and answer questions without writing tools, using only a mouse, 4)

questions in the form of audio or video can be presented effectively and completely within the online question application, and 5) the results of objective questions such as multiple choice or true/false can be obtained quickly, assisting organizers in analyzing students' abilities on each question item, reducing paper usage, and minimizing administrative time.

In practice, there are also some potential challenges in conducting online exams, such as an insufficient number of laptops, PCs, or smartphones for all students, unstable internet connections, staggered exam schedules that may lead to questions leaking from earlier to later exam sessions, and the need for a stable power supply during the exam.

SMK Brantas Karangkates is one school that routinely innovates to enhance the quality of its education. This vocational school, under the Sarana Kartika Foundation, has implemented an e-learning system used for summative exams. The Learning Management System (LMS) employed is Moodle-based. The use of Moodle LMS is expected to make it easier for students to take summative exams and more efficient for teachers to record assessments.

The background outlined above has led the author to explore the implementation of online exams using Moodle LMS. This research also aims to examine the factors that support and hinder the online exam process using Moodle LMS.

Method

The Field Work Practice (PKL) was conducted at SMK Brantas Karangkates, located at Jl. Lolaras No. 14, Karangkates, Sumberpucung District, Malang Regency, East Java, 65165. The Field Work Practice (PKL) took place from September 3 to November 30, 2023. The method used was a semi-quantitative descriptive method, which aims to explain existing phenomena by using numerical data to describe the characteristics of something and to assess the nature of observable conditions. Specifically, this approach was used to explain the use of the Moodle Learning Management System (LMS) in online exams or as a learning evaluation tool at SMK Brantas Karangkates.

Data collection methods included observation and literature review. The observation method involved examining semi-quantitative descriptive data and information related to learning evaluation using the Moodle LMS on specific websites. The literature review method involved finding reference sources, literature, or theories related to the topic being studied.

Result

Implementation comes from the English word "to implement," which means to carry out or put into effect. Implementation refers to the provision of resources to execute something that can result in impacts or consequences. Peter S. Cleaves states that the function of implementation is to establish a relationship that enables the goals or objectives of public policy to be realized as outcomes from the activities conducted by the government.

In the implementation of the Moodle Learning Management System (LMS) for online exams or as a learning evaluation tool at SMK Brantas Karangkates, it is divided into three methods:

1. Preparation

   Before conducting online exams with the Moodle Learning Management System (LMS), teachers must prepare the test items to be administered, create question categories, upload questions to the question bank, create grading categories, and add quiz features. For the Moodle LMS operator, the tasks include enrolling users to add participants to the exam for a specific subject and making several settings related to the exam.

   Additionally, there are supporting tools that need to be prepared. First, the hardware used consists of a server computer and client computers. The server computer acts as the provider of data requests made by client computers. Client computers are used by students to take the exam, and smartphones can also be

utilized. Second, the software used consists of an operating system, web server, and database. At SMK Brantas Karangkates, the e-learning software used for the online exam application is the Moodle Learning Management System (LMS).

The online exam question sheet using the Moodle LMS quiz feature is actually quite similar to a standard exam sheet. The difference lies in its facilities, which can be accessed online, allowing data in the form of students' answers to be analyzed more quickly and easily by teachers.

The stages of designing an online exam using the Moodle Learning Management System (LMS) quiz feature are as follows:

1) Creating Question Categories

Creating question categories aims to group questions in the question bank so that they are neatly organized. The steps to create question categories are as follows:

a. Log in to the subject page using the teacher's account.
b. Click on Course Administration in the Administration block.
c. Click on the Question Bank menu.
d. Click on the Categories menu, and the question category page will appear.
e. On the question category page, create a new category by clicking the Parent category column to select the parent category, typing the category name in the Name column, typing information about the category in the Category info column, and then pressing the Add category button.

The successfully created category will appear above the Add category menu. Categories that have been created can still be modified by clicking the edit icon and deleted by clicking the delete icon below the category name.

2) Creating and Uploading Questions to the Question Bank

There are two ways to create and upload questions or items to the question bank: by creating questions directly in the question bank and by creating questions in Microsoft Word and then importing them to the question bank.

a. Creating Questions Directly in the Question Bank

Log in to the subject page > click Course Administration in the Administration block > click Question Bank > click Questions; the question bank page will appear. On that page, select the storage category for the question to be created > then click the Create a new question button. A pop-up menu will display various types of questions that can be selected, such as: Multiple choice, True/False, Matching, Short answer, Essay, Drag and drop into text, etc.

For example, to create a multiple-choice question:

- Click on Multiple choice, then press the Add button; the Adding a Multiple-choice question page will appear.
- Click on Expand all in the upper right corner of the page to display all settings for the multiple-choice question.
- Fill in the multiple-choice question settings page as follows:
  a) Click the Category column to select the storage category for the question item.
  b) Type the question title in the Question name column (required).
  c) Type the question statement in the Question text column (required).
  d) Type feedback text in the General feedback column, e.g., "Thank you!" or "Proceed!".
  e) Use the One or multiple answers? menu to set whether respondents may select only one answer (One answer only) or may select more

than one answer (Multiple answers allowed).

f) Check the Shuffle the choices? box if you want to enable the randomization of answer choices.
g) Use the Number the choices? menu to select the numbering style for the answer choices.
h) Use the Answer menu to enter the answer choices. For example, type the answer choices in choice 1, choice 2, and so on columns, then click the grade menu to select the score weight for the question. The weight options range from 5% to 100%.
i) Use the Feedback column to type a brief message that will be displayed when respondents select that answer choice.
j) The default number of answer choices is five. Therefore, if fewer than five answer choices will be entered, the instructor may leave the remaining fields blank. If the instructor wants to add more answer choices, exceeding five can be done by clicking the Blank for 3 more choices button.
k) Use the Combined feedback menu to set the feedback content based on the correctness of students' answers. For example, type congratulatory text in the for any correct response column and motivational text in the for any partially correct response column.
l) Click the Save changes button to save the question.

b. Creating Questions in Ms. Word and Importing Them to the Question Bank

Some individuals find it less efficient to create question items one by one. Therefore, another method for creating question items is to draft them in a Microsoft Word document and then import them to the question bank. The steps for creating questions in a Ms. Word document are as follows:

- Type questions in Aiken format. See the following example.

Figure 1. Aiken Format

Scanner digunakan untuk...

A. Mencetak naskah
B. Menyimpan file
C. Mengetik kata
D. Memindai kertas
ANSWER: D

Istilah lain untuk memasang aplikasi komputer adalah...

A. Uninstall
B. Install
C. Open
D. Change
ANSWER: B

- If all question items have been completed, save the Word file in plain text format (*.txt). To do this, click the File tab, select the Save As menu, which will bring up the Save As dialog box. In that window, type the file name, change the file type to plain text format, and then press the Save button.
- Upload the plain text file to the e-learning platform. To do this, go to the subject page, click Course Administration in the Administration block, then click Question Bank, and click the Import button. The import page will appear. On that page, click the File Format menu and select Aiken format, click the General menu and choose the question category, then click the

Import questions from file menu to select the plain text (.txt) file you wish to upload, then click the Import button, and click the 'Continue' button to save the successfully imported questions in the question bank.

3) Creating Grade Categories

The purpose of categorizing grades is to group scores so that teachers can more easily manage student grades based on specific activities. Therefore, teachers need to create several necessary grade categories for the assessed learning activities. For example, grades for assignments are grouped in the assignment grade category, and mid-term exam scores are grouped in the mid-term exam grade category, and similarly for other activities categorized accordingly. To create grade categories, follow these steps:

a. Log in to the subject page using the teacher's account.
b. Click Course Administration in the Administration block.
c. Click Gradebook setup.
d. Click the Add Category button; the Setup: New Category page will appear.
e. Click on Expand all in the upper right corner of the page to display all category settings.
f. Type the category name in the Category name column.
g. Select the method for calculating the total score in the Aggregation menu, for example, select Mean of grades if you want the total score to be an average score.
h. Choose the type of total score in the Category total menu; the options are point, scale, and text.
i. Click the Save Changes button to save the category settings.

4) Adding Quiz Feature on the Subject Page

The steps to add a quiz on the e-learning subject page are as follows: Log in to the subject page > change the subject page mode to editing mode by clicking the Turn editing on button > click on Add an activity or resource; a pop-up menu displaying several available features on the e-learning platform will appear. Click the Quiz icon in that menu and click the Add button; the Quiz settings page will appear.

Next, click on Expand all to display all setting menu contents. The settings menu can be filled out as follows:

a. General Menu, to provide the quiz title and introduction column with instructions and rules for using the quiz.
b. Timing Menu, to set the time allowed for opening quiz questions (allocation of time for completing a quiz).
c. Grade Menu, to set the assessment method by the system, such as determining the grade category, the minimum score to pass, the number of allowed attempts, and the grading method.
d. Layout Menu, to set the number of quiz items displayed on one page.
e. Question Behavior Menu, to set whether the order of quiz questions is randomized or not.
f. Review Options Menu, to give students the opportunity to review their answers.
g. Display Menu, to set the quiz appearance when opened by students.
h. Extra Restrictions on Attempts Menu, to add a password to the quiz so that no one outside the room or unauthorized individuals can participate.
i. Overall Feedback Menu, to provide general feedback to students after answering all quiz questions. Feedback can be given based on the percentage of correct answers from 0% to 100%.
j. Restrict Access Menu, to limit access to certain students or groups of

students for the quiz.

k. Save and Display Button, to save the quiz settings.

l. After that, insert the questions saved in the Question Bank into the quiz by following these steps:

- Log in to the subject page using the teacher's account.
- Click on the title of the quiz that has been created.
- Click the Edit quiz button; the quiz editing page will appear.
- Click Add and select From Question Bank; the Question Bank window will appear.
- In the Question Bank window, select the question category to view the questions, then select the questions to be added to the quiz by checking the corresponding checkbox.
- Click the Add selected questions to the quiz button; the selected questions will appear on the quiz editing page.

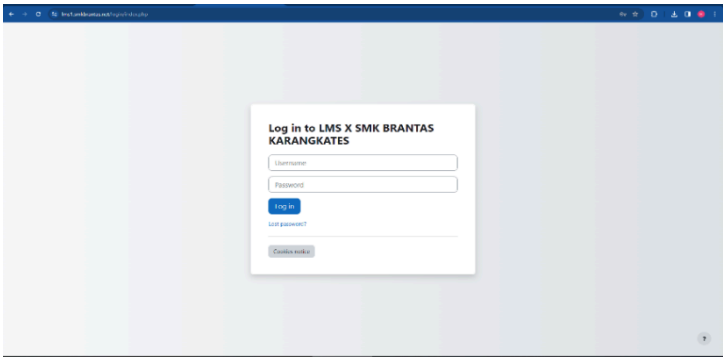
On the quiz editing page, users can also make several adjustments to the questions, such as checking shuffle to randomize the order of questions each time it is opened by students, adjusting the order of questions by clicking the move icon and dragging it to another location, changing the question content by clicking the edit icon next to the question title, and changing the score weight by pressing the pencil icon on the right side of the question, typing the value, and pressing the ENTER key to finalize it.

2. Implementation of Online Exams

The steps for exam participants to complete the online exam questions are as follows:

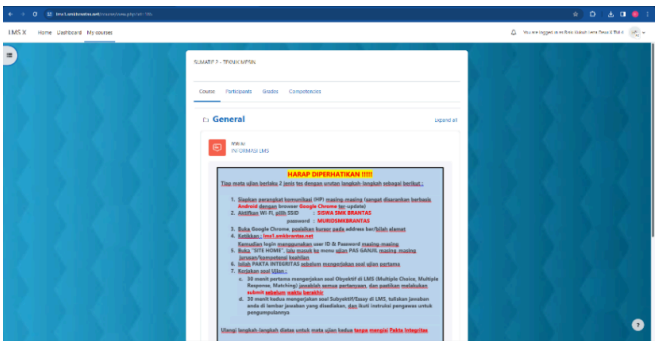
1) Open Google Chrome and type the link http://lms1.smkbrantas.net/ and then log in with your respective username and password.

Figure 2. Login Page



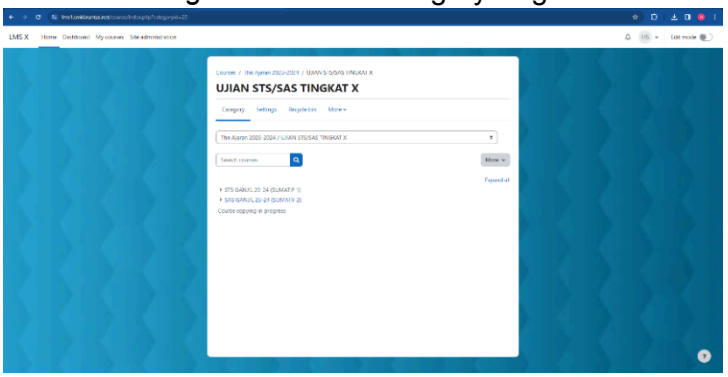
2) On the homepage after logging in, instructions will be displayed before starting the exam.

Figure 3. Homepage after Login



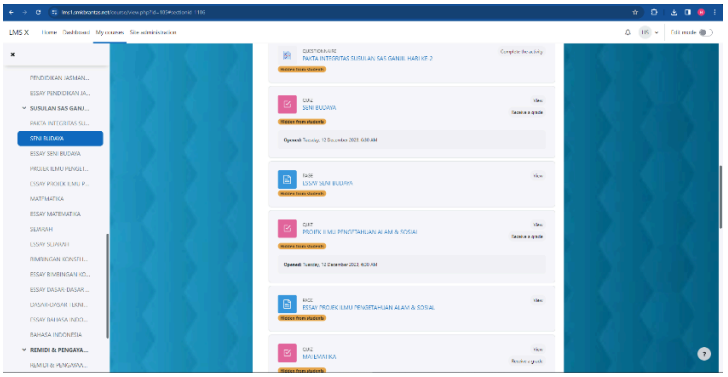
3) Click on the exam module title.

Figure 4. Exam Category Page



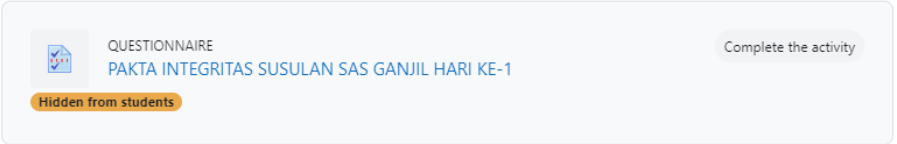
4) Enter the page displaying all subjects that will be tested.

Figure 5. Subject Exam Page



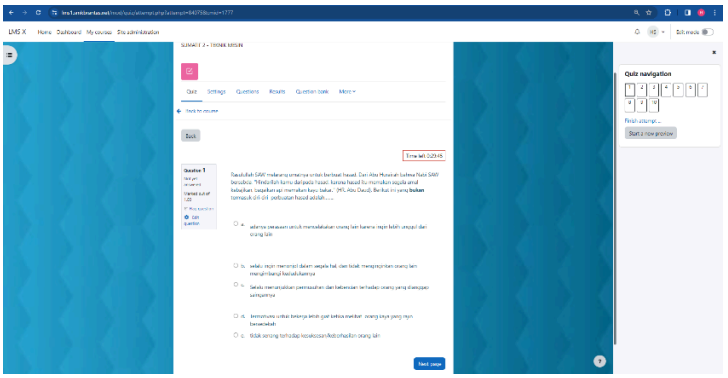
5) Before taking the exam, participants are required to fill out the integrity pact first; if this pact is not filled out, the exam questions will not be accessible to the participants.

Figure 6. Integrity Pact



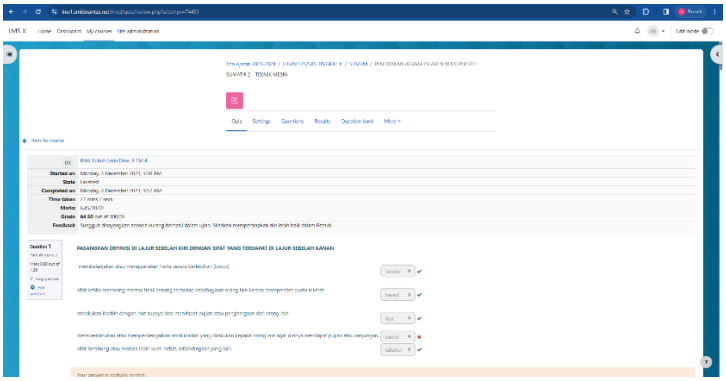
6) After selecting the tested subject, click the "Start attempt" link to begin the exam. The appearance of the online exam page using the Learning Management System (LMS) Moodle is as follows:

Figure 7. Exam Questions Page



7) After answering all exam questions, students can view their scores and review the questions.

Figure 8. Exam Results Review Page



After the implementation of the online exam, the teacher's task is to download the exam scores. The steps to correct and download scores in LMS Moodle are as follows:

1. Open Google Chrome and type the link http://lms1.smkbrantas.net/ and then log in with the respective teacher's username and password.
2. Select the exam module.
3. In the Learning Management System (LMS) Moodle owned by SMK Brantas Karangkates, subjects are categorized according to their majors. Therefore, if a teacher wants to download one subject that was taken by all majors, they must enter each major one by one and download it individually.
4. Select the subject for which you want to download the scores.

5. Click on Attempts. This page displays details of the tested subjects such as the time limit for each subject's exam and the number of students participating in that subject.
6. To download the scores, the teacher must click on the dropdown menu located at the top of the page, then select "Excel spreadsheet"; the "Export to Excel spreadsheet" page will appear.
7. On the "Export to Excel spreadsheet" page, check the score components you want to download, then click the "Download" button, and the Excel file containing all the scores and student identities will be saved to the computer.

Discussion

The implementation of the Modular Object-Oriented Dynamic Learning Environment (MOODLE) Learning Management System (LMS) at SMK Brantas Karangkates represents a significant advancement in the evaluation of learning outcomes. This platform facilitates a structured and efficient approach to assessments, allowing educators to create, administer, and analyze quizzes and exams seamlessly. The MOODLE LMS enhances the learning experience by enabling the creation of various question types, organizing them into a question bank, and providing automated grading and feedback.

This not only saves time and resources but also reduces the likelihood of academic dishonesty through features like randomization of questions. Furthermore, the system supports different evaluation categories, allowing teachers to track student performance across multiple assessments easily. However, challenges such as ensuring adequate technological resources and maintaining a stable internet connection must be addressed to optimize the online examination experience. Overall, the use of MOODLE at SMK Brantas Karangkates promotes a more interactive and effective evaluation process, ultimately contributing to improved educational outcomes.

Conclusion

Based on the data presented, the implementation of online examinations using the Learning Management System (LMS) Moodle at SMK Brantas Karangkates is categorized as good. However, several areas need improvement in this online examination implementation, including the number of computers, internet network quality, and strengthening the socialization of the procedures and regulations for conducting online examinations.

These findings provide valuable insights for enhancing the quality of online examination administration. Some alternative solutions to the identified problems include Purbo's recommendation, as quoted by (Darmawan, 2014), urging educators to be transparent in conveying the instructions for online examinations. This includes outlining the necessary equipment for conducting online tests, the rules governing the examinations, the steps for answering questions, the number of questions, and the examination time limits.

The quote also emphasizes the importance of analyzing the supporting factors for e-learning usage in planning activities, such as assessing the needs and objectives of online examination implementation, the completeness of supporting infrastructure like telephony and electricity, internet facilities and connections, the availability of necessary software, the competence of the users, and the policies and regulations regarding the standards for online examinations (Darmawan, 2014).

Several benefits have been identified from using the Learning Management System (LMS) Moodle as a medium for online examinations, including: 1) assisting teachers in storing verified questions in the question bank, 2) enabling teachers to create quizzes quickly using questions documented in the question bank, 3) helping teachers analyze student scores and report them promptly, and 4) implementing online examinations with detailed regulations and access restrictions to minimize cheating. This includes limiting quiz availability time, quiz completion time, and automatically randomizing question order each

time accessed by students. Additionally, 5) it saves costs and effort in printing and distributing question sheets and answer sheets, and 6) the results of online examinations consisting of objective questions, such as multiple-choice or true/false questions, can be quickly known, aiding the organizers in analyzing students' abilities on each question item. Another benefit of conducting online examinations is that it familiarizes students with using information and communication technology devices in education, so they are not surprised when taking other online tests, such as civil servant recruitment tests or TOEFL IBT tests.

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