

Application of Web-Based Exam System Using Local Network for Student Assessment

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Abstract— This research aims to determine the response of teachers and students to the implementation of a web-based examination system using a local network at SMAN Modal Bangsa Arun. A quantitative research design was employed, with a Likert scale questionnaire serving as the primary data collection tool. The findings indicated that teachers had a very strong response to the implementation of the web-based examination system in terms of the ease of preparing for exams and user satisfaction, while their response to the ease of operating the system and following the examination process was strong. Students, on the other hand, had a strong response to the ease of use of the system, the content being tested, and user satisfaction. Overall, the positive response from teachers in the strong and very strong categories suggests that they were generally satisfied with the web-based examination system, particularly in regards to its ability to easily create and organize different types of examination questions, its user-friendly nature, and the fact that it does not require an internet connection. Similarly, the strong response from students suggests that they were able to easily understand and follow the examination process, and that the content being tested was well-presented. These results may be useful for parties interested in conducting web-based examinations in contexts without adequate internet connectivity, as well as those seeking to incorporate a variety of examination question types and provide convenience for both teachers and students.

Keywords— *asement; technology; CBT; ICT*

INTRODUCTION

The implementation of a web-based examination system using a local area network (LAN) is one form of utilization of information and communication technology (ICT) in education. This study aims to examine the application of CBT-iSpring as an exam tool for students. CBT-iSpring is a combination of iSpring Quizmaker for creating questions and CBT application for LAN-based examination. This application has several advantages, such as not requiring an internet connection, a separate question creation application from CBT so that questions can be created more easily, available in various question types, and easy to learn and apply [1].

The rapid development of technology has affected all aspects of life. Society lives in a digital era that provides various conveniences, such as obtaining information and learning new things, which in turn also affects the education world. Therefore, the government considers the ability to utilize ICT as part of the competencies that teachers must possess, both in pedagogical and professional competencies [2]. One form of utilization of ICT in education is the implementation of exams using the CBT system. Exams using this model use computers as exam devices that replace paper and pencils. The advantages of CBT compared to paper and pencil exams are the improvement of effectiveness and efficiency in the preparation and distribution of questions because they are done digitally [3], ease the grading process, and prevent students from attempting to cheat [4]. In addition, the implementation of assessments using CBT also has a positive impact on students' learning performance and motivation [5].

There have been several previous studies related to the use of iSpring Quizmaker as an assessment tool, such as a study by Saputra stating that learning materials developed using iSpring Quizmaker can be easily understood and remembered by students [6]. Mayuri et al.'s study found that tests made with iSpring Quizmaker can effectively help students understand the concept of the material [7], and Radjibu et al.'s study also found that the test instrument developed using the same application can help students think critically and communicate scientifically [8].

This study was conducted to determine the response of teachers and students to the implementation of exams that combine iSpring Quizmaker and CBT applications in terms of preparation and implementation. SMAN Modal Bangsa Arun previously used another application for the implementation of exams. However, the application has a weakness because it can only be accessed online, making it unsuitable for use in areas with unstable internet network

quality, such as in schools. Therefore, in order to still be able to carry out web-based exams, the school is looking for alternatives and decides to use CBT-iSpring as an assessment application. This change in the application for the implementation of assessment will certainly provide a new experience for teachers and students, so their response is an interesting thing to study further. Previous studies related to iSpring Quizmaker only focused on the use of the application in a limited scale and still required an internet connection for the implementation of tests. Therefore, this study aims to obtain a response on how the application can be used on a larger scale such as the implementation of exams and not dependent on internet access because it can be accessed through a local network.

METHODOLOGY

This This research is a quantitative study that uses a Likert scale-based questionnaire to collect data. The questionnaire is divided into two types, for teachers and for students. The questions in the teacher's questionnaire are grouped into four categories: ease of preparing for exams, ease of operating web-based exam systems, ease of taking exams, and user satisfaction. The questions in the student questionnaire are grouped into three categories: ease of using the exam system, exam content, and user satisfaction.

The respondents in this study consist of grade XII students and teachers of the Modal Bangsa Arun State Senior High School who are directly related to the implementation of exams. The analysis of the questionnaire results is carried out by grouping the average percentage of respondent agreement into the appropriate categories, from very weak to very strong.

FINDING AND DISCUSSION

The CBT-iSpring based web examination system is a combination of two applications, iSpring QuizMaker as the question maker application, and the CBT application for web-based examination implementation. The publication result of iSpring QuizMaker in the form of HTML can be transferred to the CBT application for testing.

The selection of iSpring QuizMaker as the question making application is due to the user-friendly interface and the availability of various types of questions, including: 1) multiple choice; 2) hotspot; 3) sorting; 4) multiple response; 5) matching; 6) pairing; 7) filling in the blank; 8) short answer; 9) numeric; 10) true/false; 11) choosing from a list; 12) dragging words; 13) Likert scale; and 14) essay. The CBT application itself is specifically developed to support the publication result of iSpring for local testing. It only requires equipment such as a laptop as a server and a router to distribute the network to student devices.

The implementation of web-based examination system using CBT-iSpring begins with providing training to teachers on how to use the application. The training is conducted using the In House Training (IHT) method, which is a training carried out in the internal environment of the organization, where participants directly practice during training by following the instructions of the supervisor or instructor [9]. In this case, the researcher serves as an instructor and provides training on: 1) the application installation process; 2) how to create and publish examination questions; and 3) operating the web-based examination system. Teachers are also given the opportunity to participate in a pilot test of the examination, so that they can understand the perspective of students when taking the web-based examination.

After participating in the training, teachers prepare the questions for the Final School Examination (FSE) for grade XII students. After the FSE, the researcher distributed a questionnaire to assess the responses of teachers and students regarding the implementation of the web-based examination. For teachers, the researcher asks for feedback on: 1) the ease of conducting examination preparation; 2) the ease of operating the web-based examination system; 3) the ease of taking the examination; and 4) user satisfaction. Meanwhile, for students, the researcher asks for feedback on: 1) the ease of using the examination system; 2) the examination content; and 3) user satisfaction. The questionnaire results are then analyzed, and the following results are obtained.

A. *Teacher's Response to Web-Based Exam System*

Based on the analysis results, it was found that the teacher's response to the ease of implementing the exam preparation was in the very strong category with a percentage of 83%. This shows that the iSpring QuizMaker application used for creating questions can be easily understood by teachers from the installation process, creating questions, to organizing questions and publishing process. Mudrikah's research also found that the use of the iSpring QuizMaker application for learning evaluation activities makes it easier for teachers because it can minimize errors both in making questions and in assessment, questions can be displayed randomly which can reduce the chance of cheating, and there is a time setting so that the exam can be carried out more orderly [10]. In addition, iSpring QuizMaker also supports the addition of multimedia such as audio, images, and videos to the questions, so the questions being tested become more interesting and varied [11]. The teacher's response to the ease of operating the web-based exam system was in the strong category with a percentage of 80%. This result shows that teachers are able to operate the application well for conducting exams such as understanding the menu and functions, the process of inputting questions into the system, to the process of exporting student exam results. The high level of agreement on the ease of operating the

web-based exam system shows that the instructions given by the instructor during the training are successfully applied by the teacher. Arifin's research also found that if teachers are given clear and detailed explanations about the use of Computer Based Test (CBT), they can easily implement the results obtained during the training [12].

Teachers were also given the opportunity to try taking a web-based exam directly so that they can experience the perspective of students and be asked for feedback. The results of the questionnaire analysis for teachers for the aspect of the ease of taking exams through the web-based exam system were in the strong category, with a percentage of 80%. This shows that the web-based exam is easy to access both when logging in and navigating within the exam page. Then the questions, answer options and supporting elements such as images can be seen and read clearly. The ease of taking exams on the web-based exam system is due to the publication of questions and CBT application designed using a responsive web approach. The responsive web approach is a design technique that accommodates the display of the website page according to the type of device used [13]. So whatever the type of device used, the page display will be adjusted to ensure that the page content both writing and images can be seen clearly.

Teachers also showed a high level of satisfaction and were in the very strong category with a percentage of 88% for the use of the web-based exam system. This shows that teachers prefer to use the web-based exam system compared to written exams because they are easier to manage questions and implement exams. In line with Mastuti's research, which states that from the perspective of teachers, CBT is considered easier to use and has several advantages such as no need for manual correction, automatic question randomization, and more efficient and environmentally friendly [14].

The utilization of web-based examination systems by educators has been consistently increasing in recent years. This trend can be attributed to the numerous advantages that web-based exams have over traditional written exams. One of the primary reasons for this preference is the ease of managing and implementing questions. With web-based exams, teachers have the ability to easily create, edit and manage questions, making the process of preparing exams much more efficient [15]. Additionally, the use of web-based exams allows for more flexibility in the administration of exams, as they can be taken remotely and at any time [16] [17]. Furthermore, web-based exams also offer a more secure environment for the administration of exams, as they can be accessed only by authorized personnel and the results can be easily tracked and recorded [18] [19].

Table 1 Teacher responses to web-based exam systems

No	Aspects	%	Criteria
1	Ease of carrying out exam preparation	83%	Very strong
2	Ease of operation of a web-based exam system	80%	Strong
3	Ease of taking exams through a web-based exam system	80%	Strong
4	User satisfaction	88%	Very strong

B. Student Responses to Web-Based Exam System

The students gave a positive response to the use of web-based testing systems, with 71% falling into the strong category. This shows that the majority of students agree that the system is easy to use when taking exams, such as being accessible from various devices, the exam menu can be understood well, and navigation can be done easily. The ease of use of this system can increase comfort and confidence levels of students in taking exams, as well as reduce anxiety such as fear of clicking or filling out data incorrectly. Therefore, it is expected that students can give their best ability in answering questions, so as to obtain the maximum results [20].

For the content aspect of the exam, students also gave positive responses in the strong category, with a percentage of 66%. Based on these results, it can be concluded that the majority of students are satisfied with the quality of the questions, both in terms of content and appearance. However, in order to increase this level of satisfaction, teachers must pay attention to and minimize errors in question creation, such as typing errors or the quality of images used for questions with images. These shortcomings have been found in some questions, so improvements are needed to improve the quality of future questions.

In terms of user satisfaction, the majority of students gave a positive response with a percentage of 77%. This indicates that the CBT-iSpring application is well-suited for use as a web-based testing system in schools. The continuous use of this application can also support the government's efforts to integrate Information, Communication, and Technology (ICT) in learning activities to improve the quality of education [21].

Table 2 Students responses to the web-based exam system

No	Aspects	%	Criteria
1	Ease of use of the exam system	71%	Strong
2	Exam content	66%	Strong
3	User satisfaction	72%	Strong

To optimize the application of ICT in schools, there is a need for support from the school in terms of digital skills for teachers. Many teachers do not have the digital skills required in education and only receive limited training [22]. Therefore, the training carried out by SMAN Modal Bangsa Arun to improve the digital skills of teachers is a tangible support for the development of education in the school.

The utilization of technology in the classroom has become increasingly important in today's society, as it enables students to access a vast array of resources and facilitates interactive and collaborative learning experiences [23]. By equipping its teachers with the necessary digital skills, SMAN Modal Bangsa Arun is providing them with the tools necessary to effectively integrate technology into their teaching strategies, thereby enhancing the overall quality of education for its students. Furthermore, this training serves as a means for teachers to stay current with the latest technological advancements and incorporate them into their classroom instruction, which can lead to improved student engagement and achievement [24].

CONCLUSION AND RECOMMENDATION

SMA Modal Bangsa Arun has successfully implemented a web-based examination system, CBT-iSpring, to meet the needs of schools that desire an examination system without internet connectivity. This application is able to satisfy the expectations of teachers and students who provide positive feedback on the examination system implemented. Teachers can easily create and organize exams consisting of various types, as well as the operating flow of the examination system that is easy to understand and apply. Students can also follow the exam smoothly, and the content being tested can be displayed well by the system.

With the CBT-iSpring application, SMA Modal Bangsa Arun has succeeded in improving the efficiency and effectiveness in the process of conducting exams. In addition, this system also provides ease for teachers and students in taking exams, so that it can improve student learning outcomes.

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