

Implementation of Web-Based CBT Application in AIK Learning at Muhammadiyah Al-Kautsar PK School

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ARTICLE INFO

Keywords:

Computer Based Test (CBT);
Digitalization; AI-Islam and
Muhammadiyah (AIK)

Article history:

Received 2024-11-25

Revised 2024-11-26

Accepted 2024-12-24

ABSTRACT

The development of information and communication technology has had a major impact on various fields including education. In Indonesia, digitalization aims to increase the effectiveness of teaching and learning processes and educational activities. Assessment using web-based technology, such as the Computer Based Test (CBT), is a solution that overcomes various obstacles to paper-based assessment. CBT allows assessments that reduce the risk of conditions and errors. This research uses a qualitative method that applies a phenomenological approach with observation, interviews and documentation as data collection techniques. Data analysis was carried out in four stages: data collection, data reduction, data presentation, and drawing conclusions. The research results show that the implementation of a web-based CBT application increases the efficiency and effectiveness of the learning and assessment process. However, there are several obstacles, such as limited technical abilities of teachers, technical problems related to software and internet connectivity, and the difficulty of including Arabic text in exam questions. Creative solutions such as converting Arabic text into images have helped overcome some of these problems. In addition, the CBT application features that support exam security and automatic data storage provide additional benefits. Overall, the implementation of the web-based CBT application at SMP Muhammadiyah Al-Kautsar PK Kartasura shows that this technology can optimize the learning and assessment process, but several existing obstacles still need to be overcome. With further improvements in infrastructure and teacher training, CBT can become an effective tool for improving the quality of education in Muhammadiyah schools.

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INTRODUCTION

The rapid and significant development of information and communication technology has an impact on many aspects of human life in various fields, ranging from business, industry, agriculture to medicine. The impact of this technology is also felt in the field of education, where digitalization in Indonesia aims to increase the effectiveness of the teaching and learning process and the implementation of educational activities (Hafidh, Z., Nurjaman, I. M., Baits, A., & Goffary 2023). The impact is also seen in improving the quality, comfort, smoothness, and efficiency of operations that support educational activities. These advances have led to the emergence of various technological innovations and communication devices, including means of accessing fast information (Arianti, Baiq Desi Dwi, Yosi Nur Kholisho, Kholida Ismatulloh, Rasyid Hardi Wirasasmita, Muhammad Zamroni Uska, Ahmad Fathoni 2020).

Assessing student performance is an integral part of the learning process at school (Fauzi, M., Lestari, A. R. S., & Ali 2023). The aim is to obtain information about students' learning performance in accordance with predetermined objectives (Syarnubi 2022). Paper-based examination questions are costly. In addition, the quality standard of the printed paper may be poor resulting in technical errors in the duplication of questions which can result in unsightly, blurry and difficult-to-read text, which can cause students to become bored during the exam (Syarnubi 2023). In addition, it takes a long time for teachers to check students' work so that both teachers and students have to wait for the assessment results (Rahmawati, Dhian Nuri, Ana Fitrotun Nisa, Dwi Astuti, Fajariyani Fajariyani 2022). Some important aspects that need to be considered when developing ICT-based tools to assess learning outcomes are practicality, efficiency, and ease of implementation in the educational environment (Destiana, Dita, Yudhie Suchyadi 2020). To overcome these problems, it is better to use technological tools or media such as Computer Based Test (CBT).

To reduce the risk of errors in the assessment of exam results, be it daily tests, midterm exams (UTS) or final semester exams (UAS), the paper-based exam system can be replaced with computer-based exams (Syarnubi, S., Efriani, A., Pranita, S., Zulkhijra, Z., Anggara, B., Alimron, A., ... & Rohmadi 2024). The CBT system provides an objective, thorough, fast and accurate assessment. CBT also makes it easier for teachers to store different question banks that automatically randomize questions, so that each student can receive different questions, thus reducing the possibility of cheating between students. Computer Based Test (CBT) is a learning innovation that coincides with the transition era towards Society 5.0, where technology plays an important role in the learning process (Nurhayati, Nurhayati 2020).

Al-Islam and Kemuhammadiyah (AIK) must be able to provide a learning process that displays the modernist face of Muhammadiyah as a characteristic inherent in Muhammadiyah schools (Setiawan, Bahar Agus, Yus Mochammad Cholily 2021). Related to the vision and mission of Muhammadiyah education, Al-Islam and Kemuhammadiyah (AIK) is positioned as a personality identity (value foundation), ethical framework, and program implementation. Thus, AIK not only supports the realization of wasatiah education and progressive education, but also becomes the spirit and progress (Hidayat, Yayat, Madjid Naim 2023).

The results of research conducted by (Hidayat, Rahmat, Affan Septian, Arny Lattu, M. Anton Permana, Giri Verianti 2024) on the Development of Computer-Based Online Examination Applications (CBT) at Al-Ghifari Integrated Junior High School, Sukabumi Regency show that the use of CBT applications provides many significant benefits for students and teachers, such as saving time in conducting exams, facilitating the management of questions and assessments, and providing opportunities for students to learn independently. Overall, the development of computer-based online examination (CBT) applications at Al-Ghifari Integrated Junior High School in Sukabumi District can improve the efficiency and effectiveness of the learning and examination process, and provide various benefits for students and teachers (Syarnubi, S., Alimron, A., & Muhammad 2022). Thus, CBT applications can be considered as a good alternative to optimize the learning and testing process in schools (Syarnubi, S., Mansir, F., Purnomo, M. E., Harto, K., & Hawi 2021).

The results of research also conducted by (Nugroho, Budiman, and Nasution 2020) on Computer Based Test (CBT) Application for Online Daily Assessment at SMP Talenta Bandung showed that with the application of CBT application for daily assessment at SMP Talenta Bandung, subject teachers and students can easily find out the final results of the assessment, including the number of questions answered correctly, the number of questions answered incorrectly, and the scores obtained (Syarnubi, S., Fauzi, M., Anggara, B., Fahiroh, S., Mulya, A. N., Ramelia, D., ... & Ulvya 2023). This is possible thanks to the auto-correction and scoring features that are available in real-time (Syarnubi 2019).

Muhammadiyah must develop modern Islamic science that is different and always relevant to current conditions and situations. Therefore, Muhammadiyah must continue to compete to be able to survive and meet the needs of an increasingly developing and dynamic era. SMP Muhammadiyah Al-Kautsar PK Kartasura has implemented a web-based student exam application. This web application is named "SMP Muhammadiyah Al-Kautsar PK". The advantages of this web-

based application are easier correction and faster identification of test results. The school is committed to maintaining and evaluating each implementation for further innovation in both laptop devices and signals to ensure the smooth running of the exam. CBT needs to be maintained as it is an icon of the school and part of digitalization that leads to reduced paper consumption. Therefore, it is necessary to further analyze the implementation of web-based CBT applications and its barriers in AIK learning at Muhammadiyah Al-Kautsar PK School.

METHODS

The type of research used is field research (field Research), which is research conducted by survey or direct observation at a location. In a qualitative approach, generally the data collected is in the form of text, images, or other forms other than numbers. If there are numbers, they are usually only used as support. The data includes interview transcripts, field notes, photographs, personal documents, and various other records (Saldaña 2020).

This research was conducted at SMP Muhammadiyah Al-Kautsar PK which is located on Jalan Cendana II RT 02 A / RW III, Gumpang, Kartasura, Sukoharjo. The research subjects involved ICT teachers, AIK subject teachers, and students of SMP Muhammadiyah Al-Kautsar PK Kartasura. Data collection techniques include three methods; interviews, observations, and documentation studies. Data analysis in this study is data collection, data reduction, data presentation, and conclusion drawing. The observation results illustrate the implementation of web-based CBT applications in AIK learning can improve efficiency and effectiveness in AIK learning.

FINDINGS AND DISCUSSION

The use of internet technology is becoming increasingly popular and necessary. Its rapid development makes it possible to connect various aspects of life, such as communication and information exchange. The form of information can be voice, text, images, and video. Websites are becoming one of the important needs for users and are currently very popular. In the website, various information can be accessed widely, ranging from economic issues to health. Users can visit various sites according to their needs (Alifa, Shofa, Reiza Nursyanti 2023).

Computer Based Test (CBT) is a computer-based test or assessment where most of the questions are in the form of multiple choice questions. CBT is generally used to improve the efficiency and effectiveness of test administration. The CBT described here is an online test in controlled mode. This mode has a CBT concept and the test is carried out unattended, but only those who have registered and logged in can take the test (Rinaldi 2022). The implementation of the exam with the CBT system certainly has differences with the PBT Test system in terms of working media (Maulani, Muhammad Ruslan 2021). The implementation of web-based CBT applications in AI-Islam Kemuhammadiyah (AIK) learning at Muhammadiyah Al-Kautsar PK school offers great potential to improve the efficiency, security, and quality of learning assessment. With the right platform and careful preparation, schools can make the most of this technology (Syarnubi 2016).

This is in accordance with the ideals of Muhammadiyah as a religious organization that aims to create a progressive life in various fields. These ideals are realized at the national level by establishing Muhammadiyah educational institutions throughout Indonesia. In other words, Muhammadiyah wants all citizens of this country to benefit from these ideals. In establishing an educational institution, Muhammadiyah is very concerned with the design of the curriculum used in Muhammadiyah schools (Syarnubi, S., Syarifuddin, A., & Sukirman 2023). In addition to the ISMUBA (Islam, Muhammadiyah, Arabic) curriculum which characterizes Muhammadiyah education, Muhammadiyah also applies the curriculum set by the government. This happens because Muhammadiyah wants the generation born in Muhammadiyah schools to have thinking skills, religious intelligence, and emotional intelligence (Rahmadhani, Reantika Natalia 2023)

The implementation of tests using the Computer Based Test (CBT) system is clearly different from the Paper Based Test (PBT) system, especially in terms of processing media. In the CBT system, test takers directly select the correct answer on the computer screen. However, the PBT method requires participants to black out important points on the answer sheet (Rosmaladewi, Okke, Dewinda Bunga Widdian 2023).

A. Implementation of Web-Based CBT Application in AIK Learning at Muhammadiyah Al-Kautsar PK School

At SMP Muhammadiyah Al-Kautsar PK Kartasura, everything is digital so that paper is no longer used in the teaching and learning process such as conducting exams and announcing diplomas. The school has implemented a web-based CBT application so that semester and mid-semester assessments are integrated into this web-based application. The school fully supports the use of this CBT application, including infrastructure and network aspects. This support reaches 100% and guarantees the smooth implementation of the CBT application in the school. The main advantages of using web-based CBT are cost savings and the fact that the results of multiple-choice questions are immediately available to teachers, thus speeding up the correction process. In addition, CBT provides a time limit before responses are sent so that the use of time is optimized.

Each application has its own level of security, not all applications are completely secure and there are always gaps. This applies to all types of applications. At SMP Muhammadiyah Al-Kautsar PK Kartasura which uses web-based CBT, for the sake of data security, the scores displayed in the CBT application are currently only accessible to individual teachers and not to students. However, although the application has a setting that allows students to view results immediately after completing the test, this feature has been set by the administrator to be hidden from students.

Table.1 Implementation of web-based CBT application in AIK learning

No	Implementation Steps	Description
1.	Preparation of Questions and Answer Key	Teachers create questions and answer keys in Word and Excel documents. The exam committee programs the Excel.
2.	Special Preparation Before the Test	Preparation is done 3-4 days before the test. Questions and answer keys are collected. Teachers conduct a trial run to minimize errors.
3.	CBT Testing	Teachers test AIK subject questions. The test was conducted to ensure the accuracy and smooth use of the CBT application.
4.	Implementation of CBT Application Security Features	The CBT application is equipped with security features such as automatic logout if the student tries to open another tab, as well as a data restore feature to resume unfinished tests.
5.	Use of Multiple Choice and Essay Questions	The CBT app provides various types of questions, including multiple choice and essays. For essays, the app comes with keywords to detect the correct answer.
6.	Examination Implementation	Examination implementation using the web-based CBT application will be carried out on the following dates and predetermined time. Students can only access the exam during the designated time. Once the exam time has passed,

		access to the exam will be automatically closed by the system to ensure mutual security. This is done to ensure that students cannot access the exam outside the predetermined schedule, either at home or elsewhere.
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Measurement of learning outcomes is not only determined by the use of technology but also by the learning patterns of the students themselves. No matter how sophisticated the technology is, if students are not motivated to learn, the results will not change. Even if there are students whose scores do not meet the standards, each teacher will provide guidance using digital technology as a reference. Some teachers may stick to CBT, while others may choose other options such as Google Classroom or similar platforms.

B. Obstacles faced in the use of Web-based CBT applications at Muhammadiyah Al-Kautsar PK school

The implementation of web-based applications through CBT applications at Muhammadiyah Al-Kautsar PK Kartasura School has several obstacles that need to be overcome. One of them is the technology skills gap between older teachers and students who are more capable of using modern technology. Even when teachers have the skills, they often face challenges in using CBT applications effectively.

Table.2 Barriers to the implementation of web-based CBT applications

No	Aspect	Obstacles
1.	Teacher Technology Skills	Lack of skills in using technology, especially felt by older teachers, may hinder the effectiveness of using CBT applications in learning.
2.	Technical Barriers	Problems with incompatible software such as Excel or Word can make it difficult to create questions, while internet network problems can interfere with student access.
3.	Arabic Text Compatibility	Arabic text often suffers from problems in the input process into CBT systems, requiring conversion into images to preserve its structure and format.
4.	WiFi and Network Issues	Network issues or unstable WiFi connections can disrupt the smooth running of the test, requiring quick handling and technical skills from the test proctor.

Facing technical obstacles such as software compatibility issues and network disruptions, the school has sought solutions by improving the understanding and skills of teachers and technicians. In addition, converting Arabic text into images is a creative solution to avoid the technical complexity of entering Arabic text into the CBT application system. This technique is done by blocking the Arabic text and converting it into an image using the snipping feature, so that its appearance remains structured and unchanged.

CONCLUSION

Based on the research results, the implementation of web-based CBT application in AIK learning at Muhammadiyah Al-Kautsar PK School is an important development in the education process. The transformation to digital learning has brought various benefits, including cost savings and faster correction process. The comprehensive support to the school, including adequate infrastructure and network, ensures the smooth implementation of web-based CBT in the school

environment. But despite the great benefits, there are still some obstacles, especially in terms of teachers, technical facilities, and network infrastructure. Creative solutions have been found to solve some of these problems, such as converting Arabic text into images. In addition, the understanding and skills of the testing technicians are essential to handle problems that arise during the testing process.

The barriers to the implementation of web-based CBT applications at Muhammadiyah Al-Kautsar PK school can be identified in several important aspects. Challenges for teachers, especially senior teachers, highlighted the technology skill gap between teachers and students. Then, technical constraints such as software compatibility issues or poor internet connectivity affected the smooth conduct of the exam. In addition, questions related to Arabic writing are also questions that require creative solutions for a smooth exam. Finally, WiFi or network issues are important factors that affect the success of the exam. However, with a deep understanding and efficient management efforts, schools can further optimize the use of CBT applications and improve the quality of learning and assessment in the future.

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