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EVALUATION OF COMPUTER-BASED TEST (CBT) BASED ISLAMIC RELIGIOUS EDUCATION

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Abstract

Systematic learning evaluation can be used to determine and decide to what extent learning objectives have been achieved. Advances in technology and information play a vital role in digitalisation strategies for learning, one example being the use of Computer-Based Tests (CBT) in the conduct of learning assessment. The aim of this research is to analyse the implementation, outcomes and barriers to the implementation of CBT-based Islamic Education (PAI) learning assessment at SMAN 10 Bogor. The researcher employed a qualitative research method, utilising a case study approach. Data was collected through observation, interviews and documentation. The data sources for this study were the deputy head for curriculum, Islamic Education teachers, the IT team and pupils. The data obtained were subsequently analysed, and the findings of this study indicate that the implementation of CBT-based assessment was carried out in an integrated manner through school management, preparation by Islamic Education teachers and support from the IT team. Its implementation via a local area network was equipped with security mechanisms that supported the creation of a more honest assessment process. The implementation of CBT not only enhances effectiveness, efficiency and objectivity but also contributes to the instilling of Islamic character values, particularly honesty, discipline and self-confidence, in pupils. On the other hand, several obstacles arose due to internal and external factors. Consequently, CBT-based Islamic Education assessment has become an assessment model that combines the effectiveness and efficiency of technology with the reinforcement of pupils' Islamic character values.

Keywords: Computer-Based Test; Learning Assessment; Islamic Religious Education.

How to Cite:

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A. Introduction

Islamic teachings encompass the aspects of faith (tawhid), worship, ethics, and social interactions (Irawan, 2016). The Qur'an and the Sunnah of the Prophet are the sources of Islamic religious education (Yusuf et al., 2022). The goal of Islamic religious education is to attain happiness in the afterlife and to bring benefit to life in this world (Nabila, 2021). Students' skills in practicing the values of their religious teachings, which are implemented at a minimum through subject courses across all educational tracks, levels, and types (Ma'rufah, 2020). However, it is often found that when PAI subject assessments are conducted, the exam questions predominantly focus on cognitive aspects. It has been observed that some students possess greater knowledge but lack noble character (Tsalitsa et al., 2020). In the field, educators face the challenge of receiving suboptimal feedback from some students specifically those who are undisciplined, indifferent, and lack concern even when they have not completed assignments or received grades. This situation prevents PAI from achieving optimal results, and some students end up with unsatisfactory learning outcomes. These less-than-ideal character traits in students are not entirely the fault of the school or teachers; rather, they require responsibility and cooperation from various parties including parents, families, the school, and the community in guiding students and setting good, positive examples of character for them.

Assessment plays an essential and vital role and is an integral part of learning. In accordance with Law No. 20 of 2003, Article 58, paragraph 1, assessment is defined as an activity that encompasses the monitoring and evaluation of the teaching and learning process as well as learning outcomes (Siregar & Harahap, 2023). Learning evaluation comprises three stages: planning, implementation, and analysis and reporting of results (Elfira et al., 2023). In learning evaluation, a well-planned design is required that aligns with learning competencies and objectives (Lisnawati et al., 2021). Its implementation applies principles consistent with established guidelines to measure the extent to which instructional objectives have been achieved and to inform decision-making (Khairiah et al., 2022). The results can provide insights and identify areas requiring improvement (Hasanah & Himami, 2021).

Entering the era of modern education, education must begin to transform by adapting to and utilizing increasingly advanced technology to simplify processes. Computer-Based Testing (CBT) has become one alternative for conducting learning assessments as part of the digitalization effort. Furthermore, with current technological advancements, Computer-Based Tests can now be accessed via Android smartphones (Utami, 2019). This supports the completion of test questions during learning assessment activities (Sugiyono et al., 2019). Consequently, teachers can explore and evaluate various aspects of students' abilities and potential more comprehensively (Fuadiy, 2021). Furthermore, learning outcomes need to be communicated so that the evaluation results can serve as motivation for students (Usman, 2020).

Thus, the implementation of CBT-based learning assessment not only supports government programs but also facilitates the efficient and cost-effective collection and evaluation of feedback (Sutarso et al., 2023). It can also reduce and prevent cheating, save time on grading exams since the grading process can be automated and results are immediately available after the exam. Records of assessment performance are stored and can be retraced by authorized parties. Additionally, there are several supporting features for other forms of assessment (Pamungkas, 2017). The implementation of CBT-based learning assessment has been in place since 2020 and continues to this day. Schools have observed that the use of CBT in the learning assessment process simplifies the grading of questions and the entry of scores. During the implementation of CBT-based learning assessments particularly in the subject of Islamic Religious Education adjustments to the implementation, results, and challenges are inevitable. Therefore, the researcher is interested in conducting a study on “The Implementation of Learning Assessments in the Subject of Islamic Religious Education Using Computer-Based Testing (CBT) at State Senior High School 10 in Bogor City.”

B. Method

The researcher employed a qualitative research methodology. This study is a case study designed to explore the phenomenon in depth, and the researcher conducted direct field research. The research period spanned from November 2024 to March 2025. The stages included data collection through direct observation before, during, and after the PAI assessment, followed by in-depth interviews and documentation, including the academic calendar, photos of activities, and other relevant technical records. The data sources for this study were the curriculum coordinator, PAI teachers, the IT team, and two students. Data validity was examined through triangulation of sources and techniques. In this study, data procedures were based on the theory of Miles and Huberman and consisted of three stages: data reduction, data presentation, and drawing conclusions and verifying data. During the data analysis process, the researcher selected the essential data required for this study, then focused on data relevant to the research focus, and finally drew conclusions based on the analysis of the collected data regarding the implementation of CBT-based learning assessment in the Islamic Education (PAI) subject at State Senior High School 10 in Bogor.

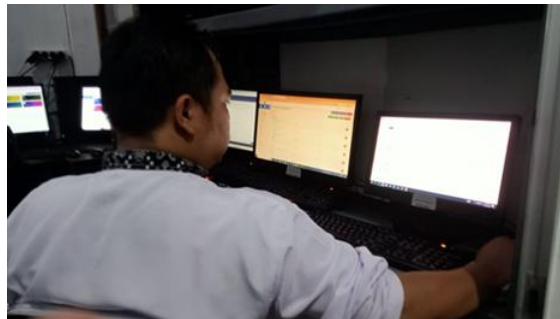
C. Results and Discussion

Based on the analysis of the findings, State High School 10 in Bogor first implemented CBT during the COVID-19 pandemic, which required learning to be shifted online or conducted from home; consequently, the school adopted the CBT system to conduct learning assessments. A teacher with the initials AH stated, “*As time has gone on, we’ve continued to use CBT because, after utilizing it, we’ve found*

many conveniences and efficiencies from using this CBT application.” A similar view was expressed by a teacher identified as FL: *“The purpose of CBT is to simplify things. With this computer-based testing system, one of the benefits is that it makes teachers’ work easier. If we were still using a manual system, we’d have to use paper, and it would take several days to grade students’ work. But with CBT, it’s easier for teachers to get real-time scores and retrieve the results immediately.”* Thus, technology is no longer merely a temporary stopgap solution but rather a primary tool that supports the improvement of educators’ work effectiveness and school operational efficiency. The following are the findings and discussion obtained by the researchers.

1. Implementation of Learning Assessment in Islamic Religious Education Courses Using Computer-Based Testing

In implementing CBT-based learning assessments for Islamic Education (PAI), there are several planning steps that must be prepared, and the technical aspects or processes involved must be understood. This is done to optimize learning assessment activities and achieve the desired objectives.



Picture 1. Planning for CBT-based assessments

This is also supported by a statement from a teacher with the initials FL: *“At the beginning, teachers were trained by the IT team. Later, teachers are instructed to prepare test questions; after creating the questions, they send copies to the IT team to prepare the devices. Once the IT team has prepared all the devices, servers, and applications, user IDs and passwords are provided to the teacher’s account. The teacher then creates a question bank, sets up the exam schedule, and informs the students.”* Teacher MF added, *“Planning for CBT-based assessments is prepared from the very beginning of the semester during the development of the learning program. We’ve already created a calendar outlining the dates for daily quizzes, midterm exams, and final exams. The preparations actually involve the IT infrastructure and other resources.”*

Thus, in the implementation of learning assessment, there are two components:

- (1) planning carried out by the school, starting with creating an exam schedule, conducting teacher training workshops to optimize CBT proficiency, and

providing devices, network access, and the CBT application through the IT team for use; (2) Teachers develop learning assessment plans by creating questions aligned with learning outcomes and the material taught to students, then inputting the questions into the CBT application and informing students of the exam schedule. (3) During the implementation of CBT-based learning assessments, students use their cell phones to access the CBT application, which must be connected to the school's Wi-Fi or local network, and then follow the instructions step by step from logging in until the exam is complete. In this process, teachers or proctors provide direct supervision during the CBT-based learning assessment, including during Islamic Education (PAI) exams, to ensure the activity proceeds in a conducive and safe manner. Furthermore, the implementation of CBT-based assessments or exams requires adequate technological infrastructure, and when supported by training for participants and proctors, it ensures that exams are conducted fairly and smoothly (Roza & Candra, 2025).

These research findings align with a study conducted by Retno Yulianti (2019), titled *"Implementation of Computer-Based Test (CBT)-Based Learning Assessment at Yadika 6 High School in South Tangerang."* The study found that CBT-based assessment still fulfills the components of the learning outcome assessment stage and does not compromise the essence of the principles of learning assessment, such as continuity. Learning assessment at Yadika 6 High School goes through a series of stages, such as the development of a lesson plan at the beginning of the semester. Subsequently, CBT-based learning assessment is utilized by teachers to evaluate students' cognitive aspects or knowledge of the instructional material that has been explained. Fair and objective CBT-based assessment can foster students' independence. This activity involves many parties, such as the vice principal for curriculum, the committee, the CBT team, teachers, and students (Yulianti, 2019).

The difference is that the previous researchers mentioned above studied the overall implementation of CBT-based learning assessment at their research sites, meaning their focus was not limited to a single subject. In contrast, the author focuses on the implementation of CBT-based learning assessment in the Islamic Education (PAI) subject at the research site. Additionally, the research locations differ. In this regard, both studies utilize CBT in the assessment process to evaluate students' cognitive aspects through a more effective system. Thus, CBT not only enhances the efficiency of assessment but can also serve as an adaptive and contextual technological medium (Syafrizal et al., 2025). On the other hand, it is also important to ensure equitable access to digital technology in terms of accessibility and ease of use. These two aspects are key factors in enabling students to take computer-based exams comfortably, independently, and fairly (Fauzi & W, 2025).

The principles of classroom-based assessment, as outlined by Usman in the book by Asrul et al. titled *“Learning Evaluation”* (2015), state several principles of learning evaluation, including continuity, comprehensiveness, fairness and objectivity, transparency and cooperation, practicality, the use of criteria-based benchmarks and accountability, and integration (Usman, 2020). The implementation of CBT-based PAI learning evaluation at SMAN 10 Bogor aligns with several of the above assessment principles, ensuring that the essence and principles of learning evaluation have a positive impact on all parties involved. Moreover, the application of religion is not merely about knowing it, but about understanding and practicing it in daily life to shape well-rounded individuals (Siregar & Zainal, 2024). On the other hand, the implementation of CBT is expected to simplify exam administration, enhance the transparency of evaluation results, and accelerate data-driven decision-making processes (Rika et al., 2026).

2. Results of Implementing Learning Assessment in Islamic Religious Education Courses Using Computer-Based Testing

The results of CBT implementation are closely related to the process of managing test results. The use of technological advancements in learning assessment marks a transformation from paper-based methods to digitalization. The purpose of assessment is for teachers to adapt to students' learning needs and improve the quality of learning (Sawaluddin & Siddiq, 2020). The assessment process has become more adaptive, offering convenience in several areas and yielding positive outcomes for all parties involved.



Picture 2. Implementing Learning Assessment in Islamic Religious Education Courses Using Computer-Based Testing

This is supported by a statement from a teacher with the initials FL: *“In terms of effectiveness, if calculated as a percentage, it’s nearly 95% effective which is excellent compared to using paper. After completing the assessment using CBT, the scores are immediately visible because we can input the answer key directly, so the effectiveness is quite high.”* Teacher MF expressed a similar view: *“This digitized CBT process helps make exams better and easier for both students and teachers; therefore, CBT can make the assessment process faster and easier.”*

There are several aspects regarding the results of CBT-based implementation, including:

- a. Effectiveness: In this context, it is effective in carrying out and realizing the mission of State Senior High School No. 10 in Bogor namely, to become a school based on information and communication technology; effective in administering exams with a large number of students; effective in conducting item analysis; effective as a basis for designing improvements to the teaching and learning process; and effective in familiarizing students with the use of digital technology.
- b. Efficiency: In this context, budget efficiency is achieved because the digital system eliminates the need for the school to print test questions and answer sheets for all students taking the exam, resulting in cost savings. Time efficiency is also achieved through the automatic generation of exam results, allowing both students and teachers to quickly view their scores via the scoring feature within the CBT application. Additionally, it makes learning evaluations more effective and transparent (Sukma & Hakim, 2019)
- c. Objectivity in its implementation and in obtaining relevant summary results regarding learning progress is ensured because scores are available in real time thanks to the digital system that processes them, thereby minimizing errors; furthermore, the CBT application includes a feature that archives detailed answer records, which can serve as evidence or data regarding students' exam results. Objective and detailed evaluation test instruments can provide information and identify areas that need improvement (Hasanah & Himami, 2021).
- d. Practicality and flexibility in this case, the practicality of implementing CBT provide ease of use and access, thereby enhancing the experience and satisfaction associated with conducting digital-based learning assessments. Consequently, there is no need to use paper and pen to answer questions (Wati et al., 2018). Additionally, this flexibility makes it easier for teachers to conduct remedial instruction at flexible times, thereby improving the assessment process.
- e. It enhances students' character; in this context, a natural shift occurs in students' attitudes, making them more focused, challenged, disciplined, honest, confident, meticulous, and trained to manage their time effectively. This is due to several features available in the CBT application.

These research findings align with a study conducted by Nur Annas Hidayatullah Laane et al. (2024), titled "*Development of a Qira'ah Skills Test Using a CBT (Computer-Based Test) Application.*" The results of their study indicate that this CBT application is an effective innovation and can be recommended for implementation in Arabic language instruction as well. Furthermore, the use of CBT applications can enhance the effectiveness and

efficiency of the qira'ah learning evaluation process (Laane et al., 2024). The key difference is that the aforementioned study utilized Candy CBT for qira'ah skill testing, whereas the present study examines the implementation of CBT in evaluating learning outcomes for the Islamic Education (PAI) subject. In this regard, CBT can essentially be utilized by teachers to assess students across various subjects and learning outcomes.

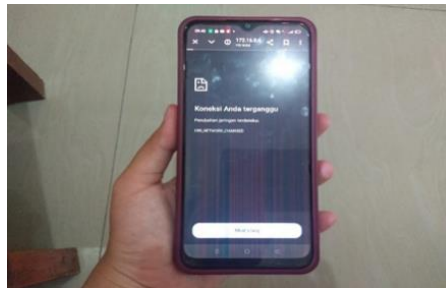
Another study was conducted by Cici Edawarni et al. (2022), titled *"The Use of Google Forms as a Learning Assessment Tool in Islamic Religious Education."* The results of the study indicate that the use of Google Forms in Islamic Religious Education (PAI) learning assessment activities provides positive impacts and benefits in terms of effectiveness, efficiency, appeal, and interface design; however, it was still found that some students engaged in cheating (Edawarni et al., 2022). The difference lies in the fact that the aforementioned researchers used Google Forms in as an assessment tool for Islamic Religious Education (PAI), whereas the current study employs CBT in the implementation of learning assessments for the PAI subject. Additionally, the research locations differ.

Based on these results, both researchers used e-learning in the learning assessment process; however, CBT offers a higher level of security than Google Forms in conducting learning assessments. This is because CBT is embedded in a local network, and when students take a CBT-based Islamic Education (PAI) assessment and switch tabs, the system automatically terminates the exam. This security measure is triggered immediately, which can improve the integrity index. Furthermore, the automatic grading system simplifies the determination of exam results without the need for teachers to check them manually one by one. Final scores, averages, and even the highest and lowest scores can be detected quickly, accurately, and in detail (Putra et al., 2019). In this context, the computer-based assessment system is designed to simplify teachers' tasks in managing tests, processing scores, and improving the effectiveness and efficiency of exam administration (Wiranata et al., 2024).

3. Barriers to the implementation of learning assessment in Islamic religious education courses using Computer-Based Testing.

With the changes in the implementation of Computer-Based Testing (CBT) (Alawiyah, 2015), various parties have begun developing applications for learning assessment or evaluation such as desktop, web, or mobile-based applications as options for schools to measure the success of teaching and learning (Karfindo & Mustafa, 2017). Furthermore, with current technological advancements, Computer-Based Tests (CBTs) can now be accessed via Android smartphones (Utami, 2019). CBT itself has undergone several rounds of development through the addition of improved features (Suhardi, 2023). However, as with any activity, challenges or obstacles are inevitable; these can also arise during the

implementation of CBT-based PAI learning evaluations, whether faced by students or teachers. In this regard, CBT enables a more objective, thorough, and accurate assessment process. Therefore, it is not uncommon for challenges to arise when implementing CBT during learning evaluation tests (Buana et al., 2024). Although digitization offers various conveniences, obstacles can still occur during the activity.



Picture 3. devices do not meet the standards required for the exam

This aligns with the statement made by a teacher with the initials MF: *“If there are external factors for example, issues with the Wi-Fi provider, problems with the power company (PLN), or a power outage or if some students’ devices do not meet the standards required for the exam, making it impossible for their devices to connect to the Wi-Fi, and obstacles stemming from the teachers themselves, so teachers must adapt to this advanced technology by staying up-to-date and becoming proficient in using computers, laptops, and other devices.”* Additionally, a student with the initials F stated, *“From my perspective, the main obstacle is the network, because not all devices or gadgets used by students are of the same quality, so not everyone can use the CBT system.”*

Thus, the obstacles encountered in this activity at SMAN 10 Bogor can be divided into two categories: First, external obstacles, including network issues that can occur during unstable weather or rain, leading to power outages; devices sometimes the central server being infected with viruses; and some students’ devices, such as cell phones used for CBT exams, being incompatible either too old or too advanced which causes the CBT system to run slowly, crash, or make it difficult to access the CBT. Second, internal obstacles include some teachers at the school who have not yet mastered operating the CBT system independently. Students are required to have devices such as laptops or gadgets, or the school must provide them in good working condition, of course to support their ability to complete exam questions during learning assessment activities (Sugiyono et al., 2019).

The results of this study are consistent with research conducted by Multazem Aji Busono and Moch. Imam Machfudi from IAIN Jember (2019), titled *“Implementation of Computer-Based Madrasah Final Exams (UAM-BK) in Madrasahs.”* In their study, the factors hindering the implementation of UAMBD-BK at Madrasah Ibtidaiyah Nurul Islam Gedagmas Randuagung Lumajang

included power outages, frequent malfunctions of some laptops, cell phones, or tablets at the start of the exam, and students who were unable to take the UAMBD-BK as scheduled due to illness and therefore had to take a makeup exam; and the utilization of the computer network after the UAMBD-BK was still not optimal. The difference lies in the fact that the previous researchers mentioned above studied the overall implementation of computer-based madrasah final exams, whereas this researcher focuses on the implementation of learning assessment in the PAI subject using CBT not only for final exams but also for formative assessments or daily quizzes. Additionally, the research locations differ (Busono & Machfudi, 2019).

Slow network access can be caused by several factors, including examinees sending data simultaneously or a large number of users accessing the system at the same time; therefore, efforts are needed to improve the quality of the server (Mahfudin et al., 2021). In addition, resource limitations such as students' lack of knowledge and skills in utilizing technology present a challenge that educators must address (Matondang et al., 2024). This positions teachers as facilitators who, among other things, are capable of creating appropriate assessment tools to measure students' learning outcomes accurately and avoid errors (Susilawati & Fitriati, 2020).

Although several obstacles arose during the implementation of the CBT-based PAI assessment at SMAN 10 Bogor, the school has already found solutions and ways to address them. These measures were implemented by the IT team performing maintenance on the infrastructure used for the assessments. Other preventive measures included providing computer labs for students who had difficulty accessing the CBT via their cell phones, performing a "clean" on devices infected with viruses to restore system stability, and moving the CBT to the school's website so that CBT-based PAI learning assessments could continue even during power outages. Thus, in this case, the school, teachers, and students alike are working together to correct the errors that occurred and striving to improve their quality and capabilities for a better future.

D. Conclusion

The implementation of CBT, integrated with school management and supported by an IT team, encompasses the entire process from scheduling and teacher training to infrastructure provision, question bank creation, exam administration, and automated result processing. Additionally, the study found that CBT administered via a local network includes a security mechanism that halts the exam when a student switches tabs, thereby supporting integrity in the assessment process. In this regard, the use of CBT-based assessment in Islamic Education (PAI) demonstrates that an objective and structured digital testing system directly transforms moral values such

as honesty, discipline, and students' self-confidence into tangible behaviors during the assessment process. The digitization of PAI learning assessments successfully bridges the gap between academic technical dimensions (effectiveness, efficiency, and objectivity) and the spiritual values of Islamic character development in students. Thus, it offers a new perspective that PAI assessment based on Consequently, the CBT-based PAI evaluation implementation model integrates pedagogical aspects, technology, evaluation management, supervision, exam security, and the handling of obstacles into a unified implementation process. These findings indicate that the success of CBT is determined not only by the application used but also by the readiness of teachers, students, infrastructure, the IT team, the monitoring system, and the school's strategies for anticipating technical challenges.

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