

Student Essay Assessment System in Islamic Education: The Use of Conventional Methods and Web-Based Application Assistance

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Abstrak

Penelitian ini bertujuan untuk menganalisis sistem penilaian esai siswa pada mata pelajaran Pendidikan Agama Islam, dengan fokus pada penggunaan metode konvensional dan bantuan aplikasi berbasis web. Penelitian ini menggunakan pendekatan kualitatif dengan metode studi komparatif. Data diperoleh melalui wawancara dengan guru Pendidikan Agama Islam kelas XI di SMKN Muhammadiyah 1 Yogyakarta yang menerapkan aplikasi ujian Broexam Unlock. Guru berperan penting dalam meningkatkan kompetensi penilaian, mulai dari penyusunan materi soal, pembuatan rubrik penilaian, hingga pelaksanaan penilaian manual. Hasil penelitian menunjukkan bahwa metode konvensional dalam penilaian esai memiliki kelemahan, antara lain membutuhkan waktu dan tenaga yang cukup besar karena proses koreksi dilakukan secara bergantian. Sebaliknya, penggunaan aplikasi berbasis web seperti Exambro dinilai lebih efisien dalam penghematan waktu dan tenaga, karena sistem secara otomatis menampilkan hasil setelah ujian selesai. Temuan ini menegaskan bahwa pemanfaatan teknologi melalui aplikasi berbasis web dapat menjadi inovasi strategis dalam meningkatkan efektivitas sistem penilaian Pendidikan Agama Islam di era digital.

Kata kunci: Pendidikan Agama Islam; Penilaian Esai; Aplikasi Berbasis Web

Abstract

This study aims to analyze the student essay assessment system in Islamic Religious Education, focusing on the use of conventional methods and web-based application support. A qualitative approach with a comparative study design was employed. Data were collected through interviews with Islamic Education teachers of Grade XI at SMKN Muhammadiyah 1 Yogyakarta, which utilizes the Broexam Unlock examination application. Teachers play a crucial role in enhancing assessment competencies, including preparing test materials, developing scoring rubrics, and conducting manual evaluations. The results indicate that the conventional essay assessment method presents weaknesses, such as requiring considerable time and effort due to manual corrections. Conversely, the use of web-based applications such as Exambro offers greater efficiency in time and workload, as the system automatically generates results after the exam. These findings highlight that technology utilization through web-based applications can serve as a strategic innovation to enhance the effectiveness of Islamic Religious Education assessment systems in the digital era.

Keywords: Islamic Education; Essay Assessment; Web-Based Application

INTRODUCTION

The learning process is incomplete if there is no assessment component in it. This assessment is a form of teacher evaluation in assessing the condition of their students whether they have mastered knowledge and skills well or not. It is also used as feedback to increase the effectiveness of learning (Dwi et al., 2022). Conducting assessments is a form of professionalism of an educator in teaching, therefore educators should be able to improve their competency abilities, one of the competencies that must be possessed by an educator is to carry out learning evaluation activities (Amalia, 2023). Theoretically, assessments are used as a tool to measure the extent of a student's abilities and can also be used as an evaluation tool (Azis et al., 2022). Evaluation is a form of follow-up from teachers to make updates in the implementation of teaching and learning activities in the classroom. One of the tests used to measure students' abilities is through essay assessment.

Essay assessment is an important component of Islamic education, as it can evaluate students' critical thinking skills, analytical skills, and understanding of Islamic concepts and principles. At the grade, school, regional, and national levels, such evaluations are expected to be used as a tool for quality assurance, quality control, and quality improvement of the education system (Dwi et al., 2022). Assessment is a broader concept than a DNA measurement and is also part of an evaluation (Marwanti et al., 2020). Assessment in a learning is used to confirm what the students already know, it is also used to measure whether their understanding meets the standard so that later the teacher can modify learning activities according to the needs of the students (Prihatin & Hamami, 2022). The assessment carried out is of course carried out based on the rubric that has been prepared so that the process becomes easier and measurable.

Before assessing students' answers, teachers usually create an assessment rubric by including several categories. The process of preparing essay assessment rubrics can be challenging for teachers, especially in Islamic education, due to the complexity of the subject matter and the need to ensure that they are fair, valid, and

reliable. The rubric is designed as a guide for teachers to provide more accurate and objective assessments and be able to describe the true competencies of students (Cahyadi et al., 2023). Rubrics help reduce inconsistencies in conducting assessments (Ayu Pradani et al., 2019). In formulating the assessment rubric, teachers use checklists and assessment scales. The assessment process can be carried out in two ways, namely by conventional or manual methods and also by application-assisted methods and also certain algorithms (Wang et al., 2022a).

Along with the development of technology and the need for more accurate and efficient assessments, automated grading systems are increasingly becoming a major concern in the world of education. Obstacles in manual assessment such as subjectivity, time limitations, and labor-consuming correction processes are the main obstacles to improving the quality and quantification of student learning outcomes quickly and objectively. In addition, not all instructors have high competence in designing appropriate assessment rubrics, thus affecting the consistency and objectivity of assessment results (Lu et al., 2020). Therefore, the development of technology-based assessment systems, including essay scoring automation, is a relevant strategic solution to address these problems and improve the quality of the evaluation process in the future.

The use of conventional methods in the assessment of essay questions, teachers must conduct assessments manually by correcting the results of each student's answers one by one by paying attention to the assessment rubric (Cahyadi et al., 2023). Although this method is widely used, it has limitations, including the potential for subjective bias and difficulty in capturing the nuances of student responses. Essay questions are more subjective because the purpose of this test is indeed used to measure the depth of knowledge of students (Chamidah et al., 2021). Generally, conventional methods are used by teachers who are still not very proficient in using applications, on the other hand, teachers who are already tech-literate have certainly made a lot of use of web-assisted applications to conduct assessments (Lahitani, 2022a).

In addition to using conventional methods in essay assessment, the advancement of educational technology has introduced new tools and applications that can assist teachers in compiling essay assessment rubrics. Some apps can help simplify the process, reduce subjectivity and improve the accuracy of assessments. The method of developing this automated essay assessment system is mostly done by matching keywords between test answers (answers to be assessed) and reference answers (answer keys). In *the concept of e-learning*, the implementation of exams can be carried out, starting from answering exam questions to the assessment process (Febriyanto, 2019). The industrial revolution also took part in the world of education as a tool to help make work easier (Mariyani et al., 2022).

Research that discusses automatic essay assessment using *the Rabin-Karp algorithm*, *Dice Coefficient Similarity* and *Synonym Recognition* has been conducted by Heru Saputro and Utomo Budiyo with the results of the study explaining that essay assessment using the algorithm obtained results with a high percentage of accuracy. The results of the correction of values using *the web* are close to the manual assessment carried out (Saputro & Budiyo, 2024). Another study that discusses the automatic essay answer assessment system with the help of an application was conducted by Imam Mufiid, Sri Lestari and Ni'ma Kholila using *the web-based synonym recognition* and *cosine similarity* method with the results of the study showing that by using a web-based application, the process of assessing the results of answers to students' essay questions is carried out more easily and quickly and with high accuracy (Imam Mufiid et al., 2021).

The reality in the field is that there are still many teachers who use conventional or manual methods in conducting essay assessments. Given the importance of essay assessment in Islamic education and the limitations of conventional methods, teachers need to develop assessment methods to better follow technological advances, namely with the help of applications. Thus, this research is important to fill this gap by analyzing not only the efficiency but also the influence

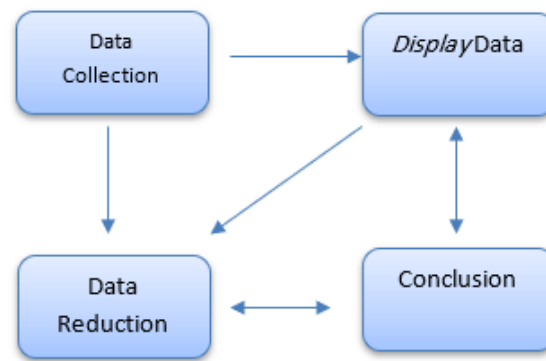
of web-based applications on the quality of teacher assessment and perception, especially in the field of Islamic Religious Education

RESEARCH METHODS

The method in this study is a qualitative method with a comparative study approach. Qualitative research is a research procedure that produces descriptive data in the form of written or spoken words from people and observable behaviors (Abdussamad, 2021). This study compares two methods carried out in conducting essay assessment, namely conventional methods or manually and also using web-based applications with certain algorithms.

Data collection techniques were carried out through interviews, observations, and documentation studies. Interviews are a data collection technique that involves direct interaction between researchers and participants to obtain in-depth information about the experience and perception of PAI teachers in using the Broexam unlocking exam application (Ardiansyah et al., 2023). In addition, observations were made on the process of implementing essay assessments using the application in the field to get a real picture of the practice that took place. Documentation studies are also carried out by reviewing related documents such as assessment rubrics, exam result reports, and other supporting data relevant to the assessment process.

The data was obtained directly from the main informant, namely the PAI teacher of grade XI SMKN Muhammadiyah 1 Yogyakarta, who was chosen as the research subject because the school actively used the Broexam exam application in assessment activities, thus allowing researchers to obtain complete and accurate data related to the process, obstacles, and benefits of implementing the web-based application.



Picture 1. Data Analysis Methods

RESULTS AND DISCUSSION

Before presenting the results and discussion, the researcher first explained the theoretical studies used as a basis to obtain more targeted and comprehensive research results.

Conventional methods in essay assessment

Conventional methods in essay assessment typically involve the use of structured and detailed assessment criteria, as well as using clear and specific assessment scales. Because essay assessment should focus on the objectivity of students' answers. Some examples of methods that are usually used in essay assessment with conventional methods are *Checklist*, *Rating scale*, *Free-Form method*. But in practice, this conventional method has drawbacks such as the potential for greater subjectivity and bias (Cahyadi et al., 2023).

Conventional or manual methods require assessment rubrics as a measuring tool in assessing student work results. The position of the rubric is very important because it is a reference for assessment tools in the hope of minimizing the potential for subjectivity (Saffanah & Hamdu, 2022). The rubric is also a guide in providing a consistent assessment so that it can ensure the quality of the assessment (Ikbali et al., 2023). Rubrics or assessment instruments are used so that assessments can be carried out objectively (Alfianika & Sitohang, 2022). By referring to the rubric or assessment instrument that has been made, the assessment process becomes easier (Supratama, 2024).

Rubrics are tools used to assess student work and at the same time provide feedback with criteria and descriptors that are in accordance with the level of performance or instruction of the assignment given (Ozfidan & Mitchell, 2022). The use of conventional or manual methods in essay assessment, teachers take longer because the assessment process is carried out alternately while still continuing to be based on the rubric that has been made. The positive side of assessment that is done manually is that teachers can carefully correct each student's answer in detail and completely. The negative side is that in using this method it takes a relatively long time, especially if the number of questions and students are large (Supratama, 2025). With a note, the rubrics that have been compiled by the teacher must be understood by students before students start working on the problem (Fatmawati et al., 2022).

Use of web-based applications in essay assessment

The development of technology and information today certainly also has an impact on the world of education (Supratama et al., 2024). With the advancement of technology, many new innovations in the field of education have emerged, one of which is the use of *websites* to be used in automatic essay assessment (Salim et al., 2023). Data processing done with the help of *the web* helps make human work easier because it can minimize the labor and time that should be used (Setiawan & Pasha, 2020). By utilizing *the e-learning system* and the features in it, of course, it provides convenience in the learning process starting from the preparation stage including evaluation, including in the process of assessing student answer essays (Febriyanto, 2019). Digital assessments have a positive impact on student work outcomes because students' answers are clearly identified. And this digital assessment has been successfully implemented in replacing paper-based test evaluations (Rahman et al., 2022).

The presence of this web-based application is a time-saving tool for educators so that this time can be used to do or create other tasks (Hicke et al., 2023). The rise of the development of *online education* that has occurred, it is in line with the development of assessments carried out online as well (Wang et al., 2022b).

Automated web-based assessments have their own models and ways of applying. Adapting to the required commands and needs (Jiang et al., 2023). In addition to being a tool to make it easier for teachers to assess student work results, utilizing this web-based application can also increase the feed of understanding students (Huang et al., 2023)

The use of web-based applications with certain algorithms, of course, makes essay assessment easier and minimizes errors. One example is the use of the *Dice coefficient similarity algorithm*, which is by calculating the similarity of text (Saputro & Budiyanto, 2024). In addition, there is another type of algorithm which is *winnowing*. *Winnowing* algorithm is a *document fingerprinting* method that utilizes *hashing* to detect similarities in text and by using the algorithm, the assessment results have high accuracy (Salim et al., 2023).

Another type of algorithm used to automatically assess essay answers is *the synonym recognition and cosine similarity methods*. The way this algorithm works is by matching and calculating the proximity value between the student's answer text and the answer key that has been entered into the application system so that the chances of students' answers not being read are very minimal (Imam Mufiid et al., 2021).

The following are the results and discussion of the research that has been conducted with the title "Student Essay Assessment System in Islamic Religious Education: The Use of Conventional Methods and Web-Based Application Assistance."

Assessment of the results of student essay answers conventionally by referring to the assessment rubric.

Islamic Religious Education Islamic Religious Education is one of the subjects taught at SMKN 1 Yogyakarta which is used as a research location with a duration of more than two hours face-to-face in every one week of meetings. In the learning process of Islamic religious education, of course, teachers refer to the learning plan starting from the preparation stage to the learning evaluation stage. During the

learning process, teachers also use supporting media to motivate students to be active in the classroom.

After the learning process is complete, the teacher usually conducts an assessment by providing several multiple-choice questions and also essay questions to measure students' understanding of the material that has been explained. After the students have done the questions according to the instructions, then the teacher corrects the results of the students' answers to find out the extent to which the students understand the material. Usually, teachers assess the results of these students' essay answers manually or correct the students' answers one by one referring to the rubric that has been made.

Based on the results of an interview with one of the PAI teachers at SMKN 1 Muhammadiyah, information was obtained that so far the teacher had assessed the results of students' answers manually. This is done when students do daily exams only. In conducting assessments, teachers refer to rubrics that have been made so that the assessment is more objective. The teacher determines the assessment criteria and scores for each qualification. The range of scores given for each question item is 1-10.

"I do an assessment of the essay questions on the material that I have taught by referring to the rubric that I have made before. And I have also explained the rubric to the students so that the students' answers can be in accordance with the rubric that I have made. With the rubric, I can be objective in giving grades according to the abilities of each student" (P1, n.d.)

The creation of an essay assessment rubric is certainly an important thing to do to make it easier for teachers to provide scores that are in accordance with the answers given by students. The rubric is also a guide in providing a consistent assessment so that it can ensure the quality of the assessment (Ikbal et al., 2023). In making rubrics, so far teachers have not found obstacles because from the beginning they have determined the material used as a reference in making questions.

"So far, there have been no obstacles in making rubrics. Because from the beginning I have determined what material will be reduced to essay questions. The obstacle in this case may be interpreted as that teachers in making questions and criteria are sometimes still not able to reach students' abilities and understanding, especially in students with low abilities." (P1, n.d.).

After making a rubric and getting the results of the students' questions, the teacher began to match the answer results and answer keys to find out the score of each student. With the difference in characteristics and level of understanding in each student, the answers produced are also more varied and produce varied grades as well. The teacher's strategy to try to make the students' answers match the answer key is that after the teacher determines the material to be used as material in making the question, the teacher makes an assessment rubric and informs the rubric to the student so that the student understands and understands the answer that must be written. Of course, in making the questions and rubrics, teachers also pay attention to the abilities of the students. Only then do the teacher enter the stage of essay assessment which is done manually.

In the assessment process that is carried out conventionally or one-on-one with reference to the rubric that has been made, of course, it takes a long time and also more energy. But by referring to the rubric that has been made, teachers can minimize the potential for objectivity and give grades according to the results of the answers written by students.

Essay assessment using exambro web-based exam application

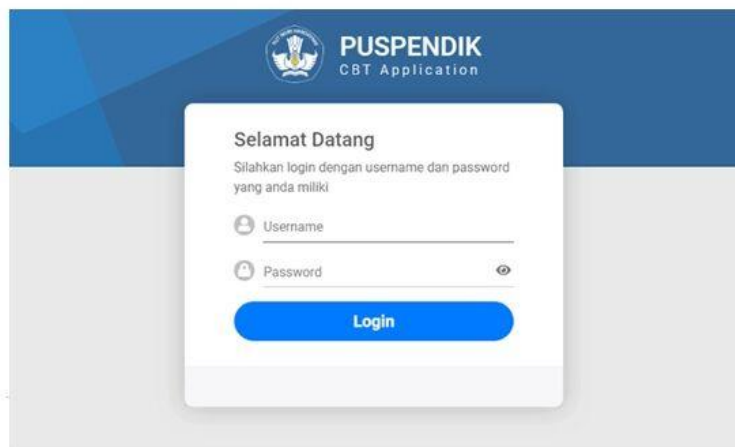
The use of web-based exam applications has been widely carried out at every school level, including at SMKN 1 Muhammadiyah Yogyakarta. Based on the results of an interview with one of the PAI teachers, information was obtained that when conducting the final assessment, a web-based assessment system called *broexam* was used.

"The assessment is done using *the exambro unlock* application. The use of the application is only carried out during semester assessments, when the daily assessment is still using conventional methods"(P1, n.d.)

The use of web-based applications in conducting essay assessments is indeed based on the exam system that has been using applications since the beginning. This application is not only used as a tool for students to work on final assessment

questions, but also used by teachers as a tool to conduct essay assessments by the teacher entering or input assessment rubrics into the application and then an application that calculates or corrects the results of student answers.

Exambro is an ANBK application developed by Pusmenjar which is a special browser that will later be used by *clients* or students to work on National Assessment questions. ExamBrowser has a different appearance and is designed with a high level of security that prevents AN participants from accessing other applications while working on AN questions. The ExamBrowser Client function displays the full test screen/page without navigation, preventing test-takers from moving to another application. In addition, ExamBrowser Client is also useful for ensuring that clients who are taking the exam are true users of the official Pusmenjar application, so that they can minimize access to the exam page from uninterested parties. (*Mengenal Exambrowser, Aplikasi Pelaksanaan ANBK*, 2021).



Picture 2. Initial view of the *exambro* application

One of the advantages of using this *exambro* application is that students cannot open other applications or *other websites* at the same time during the exam. This minimizes cheating in conducting exams so that here students can focus on doing exam questions without being disturbed by their concentration. Students can work on exam questions independently. For teachers, this application helps to make the assessment process easier. Because in this application, after taking the exam, the grades can immediately appear automatically and the recapitulation of the score results is immediately sent to the teacher (Palaloi et al., 2023).

Based on the results of interviews and observations conducted on Islamic Religious Education teachers at SMKN Muhammadiyah 1 Yogyakarta, the use of web-based applications such as Exambro has been proven to increase the efficiency of time and energy in the essay assessment process. The data shows that the automated correction process carried out by the system is able to significantly reduce the teacher's workload, with the average time required to assess a single student reduced by up to 50% compared to the manual method.

In addition, the accuracy of assessment results based on feedback data from the system indicates a higher level of consistency, reducing the potential for subjectivity and bias often found in manual assessments. Quantitative data support from the results of the system validity test showed that the accuracy of the assessment reached 89%, while the level of trust from teachers in the results of this assessment reached 85%, which was measured through questionnaires and interviews.

Analysis of this data corroborates the claim that the use of web-based applications, such as Exambro, not only improves the efficiency of the assessment process but also increases objectivity and consistency in essay assessment. These results are in line with the literature that states that the integration of technology in the assessment process can support a significant improvement in the quality of educational evaluation.

The use of this application helps to facilitate teachers' work and minimize the effort that teachers have to spend to correct each student's answer. By utilizing applications run by computers, it can make it easier to correct and score the answer results (Lahitani, 2022b). The existence of technological developments in the world of education can be known by the many systems or websites that are also used in the learning process (Arifuddin et al., 2023). To address the subjectivity problem and shorten the time to correct the student's answer, an application is needed to solve the problem (Arifuddin et al., 2023).

Compared to the negative side of using applications during exams, there are more positives when teachers use web-based applications in conducting essay

assessments. Among them is minimizing cheating committed by students during the process of work and also minimizing the time used by teachers to correct the results of students' answers one by one because it takes a long time and energy so that here technological developments must be used well by teachers to make the learning process easier.

CONCLUSION

The conventional essay assessment method has significant weaknesses, such as requiring considerable time and effort and the tendency for human error in the correction process. In contrast, the implementation of web-based applications such as Exambro and algorithm-based automated grading systems can improve the efficiency and accuracy of essay grading. The use of this technology allows for automatic and fast checking, so that the assessment system becomes more effective and reliable in supporting Islamic education in the digital era.

These findings confirm that technological innovation through web-based applications is a strategic solution to improve the quality and effectiveness of educational assessments, especially in the assessment of essays on Islamic Religious Education subjects. Therefore, the use of intelligent systems in the assessment process needs to be supported and further developed to support teacher competence and accelerate the process of evaluating student learning outcomes.

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