

Improving the Quality of UTBK Simulations at MA Al-Azhar Asy-Syarif Sumatera Utara through the Development of Adaptive Elearning for Teachers and Students

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ABSTRACT

To ensure that its graduates can be accepted at various leading universities in Indonesia and also on international campuses, MA Al-Azhar Asy-Syarif implements a Computer Based Written Examination (UTBK Simulation) simulation program which is held every week. However, the UTBK simulation exam held by MA Al-Azhar Asy-Syarif is still carried out manually and is not well managed, so it takes a lot of time and energy for the teachers and homeroom teachers to prepare for the UTBK simulation. Based on the problems faced by partners, the service team built a UTBK simulation system based on adaptive elearning. Where the system is built based on the Moodle elearning platform which allows the UTBK simulation exam to be managed quickly and easily by teachers and school IT admins. Management includes implementing UTBK simulations such as selecting questions based on departmental competency and question weight, generating random variations of questions, automatic grading, exam timing management and automatic analytics. The implementation of the service also includes training in using the UTBK simulation system which is attended by all teachers and also the school IT admin. Evaluation and follow-up are carried out by distributing user satisfaction surveys which are carried out by distributing questionnaires to training members. Based on the survey results, the majority of system user respondents, namely 81%, agreed that the UTBK simulation system that was built could increase the effectiveness of implementing UTBK simulations and also improve students' adaptive learning, while 19% expressed a neutral opinion and no respondents said this system was ineffective. Based on this, it can be concluded that the UTBK simulation system based on adaptive elearning can be implemented and is beneficial for partners.

Keywords: UTBK, UTBK Simulation System, E-learning, adaptive E-learning

INTRODUCTION

Madrasah Aliyah (MA) Al-Azhar Asy-Syarif North Sumatra is a high school in North Sumatra based on the Islamic religion that applies technology to achieving the curriculum or education program that it has prepared. By carrying out a balanced education program between the religious curriculum and the national curriculum, the North Sumatra Al-Azhar Asy-Syarif Foundation has implemented the adoption of modern digital-based teaching methods (Gunawan et al., 2023). Where every student and teacher uses iPad media as a learning support. The iPad is a tablet-based computing device produced by the technology company Apple Inc which can be used as a learning medium (Apple. Inc, 2023).

One of the missions of MA Al-Azhar Asy-Syarif is to develop students' abilities to synergize, achieve, and compete at national and international levels (Al-Azhar Asy-Syarif, 2023) where one of the goals is the students of MA Al-Azhar Asy-Syarif Syarif was able to graduate at various leading universities in Indonesia and also at international campuses. To make this happen, MA Al-Azhar Asy-Syarif implemented a

computer-based written exam simulation program (UTBK Simulation) which is carried out every week. UTBK is a state university entrance exam in Indonesia which is taken by final-year SMA/MA students who wish to continue their studies at Indonesian universities using the national selection route (TSI LTMP, 2023). Meanwhile, the UTBK simulation is a test that prospective UTBK participants take to prepare themselves and measure students' abilities before taking the actual UTBK (Sulaiman & Khaerudin, 2021). The test simulation method also called tryout is a strategy that is often used by educational institutions so that students can face real exams (Arianggara et al., 2021). Exam simulations can also be a means for students to practice answering questions so that students can improve their exam results and self-confidence (Hifza et al., 2020; Rohaendi, 2019). However, currently, the UTBK simulation exam held by MA Al-Azhar Asy-Syarif does not fully reflect the actual situation and conditions in UTBK. For this reason, a UTBK simulation system is needed that is similar to the real UTBK so that teachers can get an idea of students' abilities and weaknesses that need to be corrected so that it can become an effective strategy to increase their chances of entering college.

. The stages of implementing the UTBK Simulation in the current existing conditions are, every week the lesson teachers are asked to create questions, and then the class teacher collects these questions and enters them into a Google form. The homeroom teacher then reports to the IT department so that the school IT department creates a question form link in exam mode. During the exam, students use an iPad and access the link. The exam results are then processed manually using an Excel spreadsheet and displayed on Google Drive. The stages of implementing the existing UTBK simulation can be seen in Figure 1.

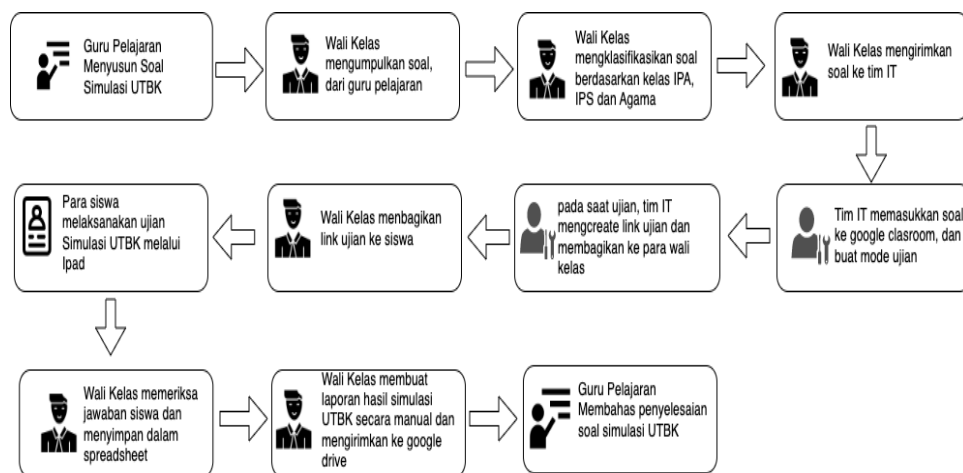


Figure 1. Existing Conditions of UTBK Business Processes for Partners

Based on the existing situation, it can be seen that it takes a lot of time and energy for the teaching teachers and homeroom teachers to prepare the UTBK simulation every week. Most of the stages are still carried out manually and are not well managed. Based on the existing situation, it can be seen that it takes a lot of time and energy for the teaching teachers and homeroom teachers to prepare the UTBK simulation

every week. Most of the stages are still carried out manually and are not well managed. MA Al-Azhar Asy-Syarif has not utilized the availability of information technology facilities optimally. Apart from that, the questions tested in the UTBK simulation exam also did not go through a good evaluation and follow-up process. Measuring the competence of this question is very important because students' abilities can be measured by solving questions, as well as students' talents and interests can be seen from their interest in solving questions based on their competence. Another problem is that the UTBK simulation method applied to existing conditions at MA Asy Syarif does not yet support adaptive learning. Adaptive learning is learning that focuses on providing a more personalized and effective learning experience for each student (Muñoz et al., 2022), so that they can achieve their maximum learning potential. However, this adaptive learning cannot be achieved because the media for discussing questions interactively is not yet available. In current conditions, teachers discuss all the questions tested in the simulation sequentially. However, this is not effective because each student has different questions that require deeper understanding. Every student should be able to see which questions are considered difficult and see the discussion provided by the system, and if they have questions they can ask the teacher. For this reason, an optimal media for implementing the UTBK simulation exam is needed so that teachers at MA Al-Azhar Asy-Syarif can use it efficiently and effectively.

Based on the problems faced by partners, the focus of the service is how to improve the quality of the UTBK simulation at MA Al-Azhar Asy Syarif, North Sumatra so that the UTBK simulation can produce a simulation system that is effective, reliable and capable of generating automatic analysis related to competency fulfilment for each student who takes part in the simulation. UTBK. Apart from that, the UTBK simulation system can be used as a medium and tool for students for adaptive learning. Based on this, this service aims to build an adaptive elearning-based UTBK simulation system that can be set up easily and is well managed. The system can store all the questions and discussions that have been prepared by the lecturer teaching the lesson every week in a question bank. From this question bank, system users can select various types of question variations automatically based on the category and weight of the questions. The system is also able to automatically generate the results of student answers and also the results of competency analysis that students have achieved. Based on a well-managed UTBK simulation system, teachers can be empowered to compose and improve the quality of questions without having to be burdened with long and ineffective UTBK simulation administration stages.

MATERIALS AND METHODS

The method of implementing the service includes three main stages, namely building a UTBK simulation system based on adaptive e-learning, training in using the UTBK simulation system and evaluating the system.

2.1 System Development

The system development was carried out according to the needs of MA Al-Azhar Asy-Syarif, where user requirements were carried out with a Focus Discussion Group (FGD) between the service team and the teachers of MA Al-Azhar Asy-Syarif and also the IT admins at MA Al-Azhar Asy-Syarif. The FGD was carried out online using the Zoom platform. The display of FGD activities via Zoom can be seen in Figure 2.

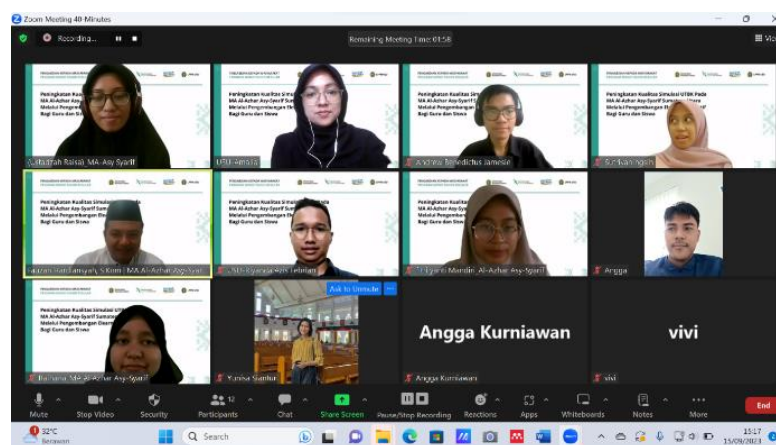


Figure 2. FGD between the Service Team and Teachers at MA Al-Azhar Asy-Syarif

Based on the results of the FGD, it can be concluded that the need for MA Al-Azhar Asy-Syarif is a UTBK simulation system that is adaptive and efficient and can be managed quickly and easily by lesson teachers, homeroom teachers and also the MA Al-Azhar Asy Syarif IT team. In this service, the system was built using the e-learning platform Moodle (Moodle, 2023). The Moodle e-learning platform was chosen because Moodle is an LMS (Learning Management System) which has been proven to be effective (Gamage et al., 2022). The Moodle platform makes it possible to organize, distribute and manage learning materials, follow student progress, and provide communication and collaboration tools between teachers and students (Nasution et al., 2020). Moodle has a feature to add various forms of questions including multiple choice. Question input can be done quickly with certain formats such as Aiken and GIFT formats (Gamage et al., 2019; Mintii et al., 2019). Apart from that, Moodle is also equipped with various plugins that can be used to help with automatic assessment (Attard & Byrne, 2013; Huerta et al., 2022). This is because the assessment for UTBK has different weights for right answers and wrong answers, where this rule can be easily implemented in Moodle e-learning. Building the system took around 1 week, during which the service team continued to coordinate with the teachers at MA Al-Azhar Asy-Syarif.

The application is built on a Virtual Private Server (VPS) with the domain <https://tryoututbk.my.id>. The VPS used is adjusted to the partner's needs, namely around 250 students. The features built are by needs and have features such as simulation settings, user management settings, question bank management

features and UTBK management features. Access to features is regulated based on the role of the system user, namely Lesson Teacher, Class Teacher, IT Team and Students. An overview of the features and user roles in the UTBK simulation system based on adaptive e-learning can be seen in Figure 3.

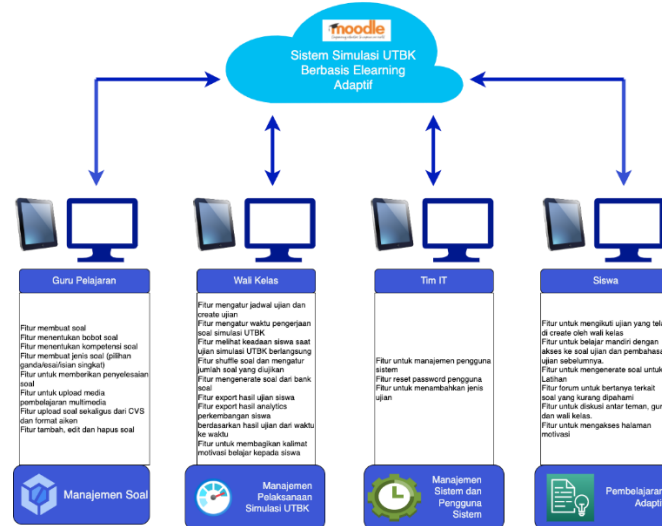


Figure 3. Role-based feature settings in the UTBK simulation system that was built

The system user role settings are identified when the system user logs in to the adaptive e-learning-based UTBK simulation system. The login page display can be seen in Figure 4.



Figure 4. Login page display

Based on observations from the service team, all features of the UTBK simulation system based on adaptive e-learning are operational. An example of one of the system feature displays is Question Bank management which can be seen in Figure 5 and the UTBK simulation implementation display feature which can be seen in Figure 6.

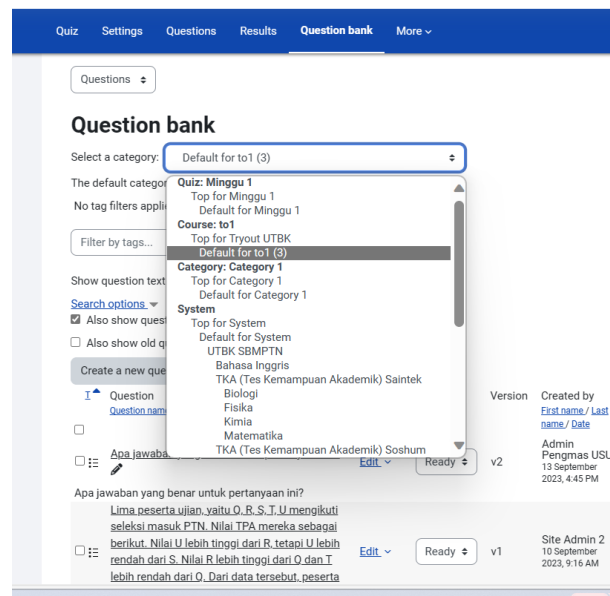


Figure 5. Question Bank Management Features

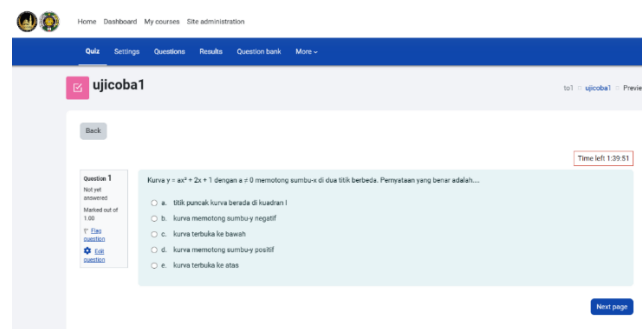


Figure 6. UTBK Simulation Display

2.2 System Use Training

After the system was completed, the service team then carried out system training for system users, namely teachers and students of MA Al-Azhar Asy-Syarif.

The training was conducted on September 19 2023. The training involved 21 training participants consisting of 18 school teachers and 3 school IT admins. The material provided includes:

- Transfer of Knowledge related to Preparing UTBK Simulations
- Transfer of Knowledge related to Preparing Questions and Setting Question Weights
- Transfer of related knowledge Managing competency Questions
- Transfer of related knowledge Automatically upload questions to the Question Bank
- Transfer of related knowledge Setting time and shuffling questions automatically
- Transfer of Knowledge Related to Automatic Export of Student Exam Results
- Transfer of Knowledge Related to Export of Student Exam Analysis Results from Time to Time
- Related Knowledge Transfer Adding Interactive Learning Media such as Video to the UTBK Simulation System.

- i. Transfer of knowledge to the IT team regarding UTBK Simulation System management
- j. Transfer of Knowledge related to Adding/Enrolling Student Roles into the System
- k. Transfer of Knowledge related to Adding/Enrolling Teacher Roles into the System
- l. Transfer of Knowledge related to Organizing Question Banks Based on Question Weights

The training began with the handover of the system from the service team to the school. The system was handed over symbolically from the service team to the director of the Al-Azhar Asy-Syarif Foundation as in Figure 7.



Figure 7. Symbolic Handover of the UTBK Simulation System

Furthermore, the training is carried out using the learning-by-doing method where teachers learn while practising directly. The training atmosphere can be seen in Figure 8 and Figure 9.



Figure 8. Training atmosphere for using the Adaptive E-Learning Based UTBK Simulation System



Figure 9. Training using the Learning by-Doing Method

The end of the training was closed with a discussion and also a group photo as in Figure 10.



Figure 10. Group photo of the service team and trainee teachers

RESULTS AND DISCUSSION

To see the success of the service program, an evaluation was carried out regarding the suitability of the UTBK simulation system built to the needs of partner schools. Evaluation is carried out by distributing a list of questions via gform to training participants. This stage aims to analyze input from partners and carry out evaluations and follow-up actions. The survey was carried out by asking questions related to satisfaction with the system that had been built and also related to training in using the system. In connection with the system being built by user requirements from partners, the survey focuses more on system effectiveness, test security and system appearance. Survey answers are classified based on a scale, namely from scale 1 to scale 5. Scale 1 is strongly disagree, scale 2 is disagree, scale 3 is neutral, scale 4 is agree and scale 5 is strongly agree. The survey questions and survey results can be seen in Figures 11 to Figure 13.

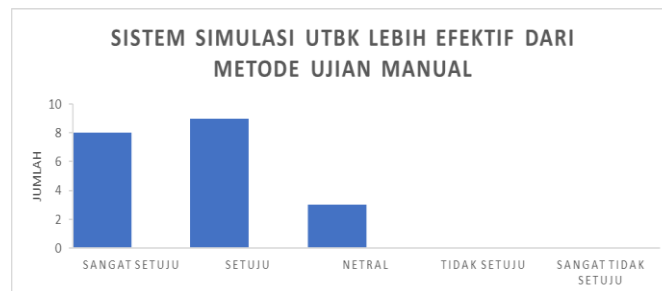


Figure 11. Survey regarding the effectiveness of the system being built.

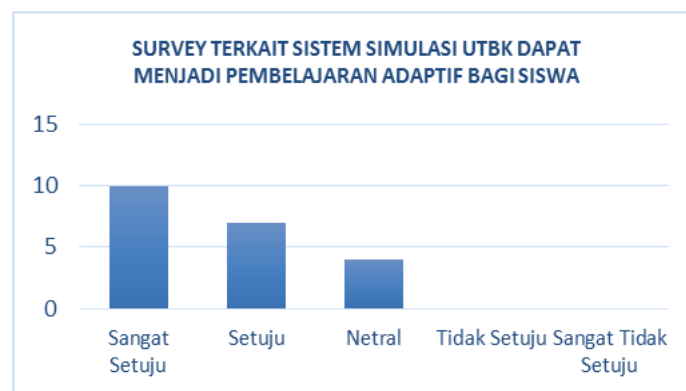


Figure 12. Survey regarding the UTBK Simulation System which can be a Student Adaptive Learning Media

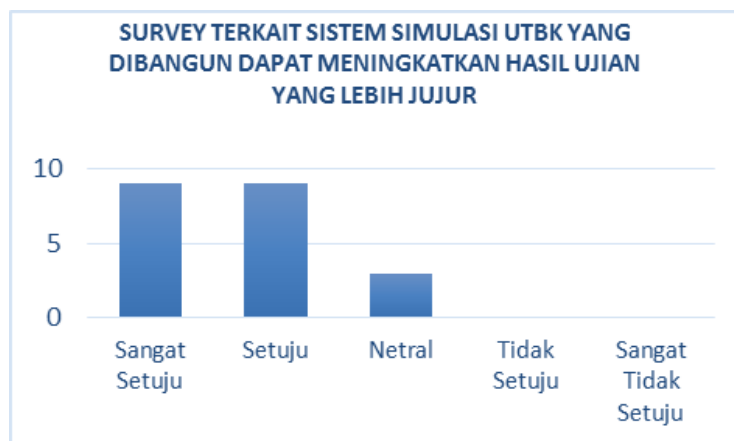


Figure 13. UTBK Simulation Survey can hold exams that further increase test takers' honesty

Based on the survey, the majority of system user respondents, namely 81%, agree that the UTBK simulation system that has been built can increase the effectiveness of implementing UTBK simulations and also improve students' adaptive learning, while 19% expressed a neutral opinion. Respondents also provided a survey regarding the UTBK system based on adaptive elearning which can increase students' honesty in carrying out exam simulations. This is because the system built has a save browser exam feature and

randomization of questions. More details regarding the analysis results can be seen in Figure 14, Figure 15 and Figure 16.

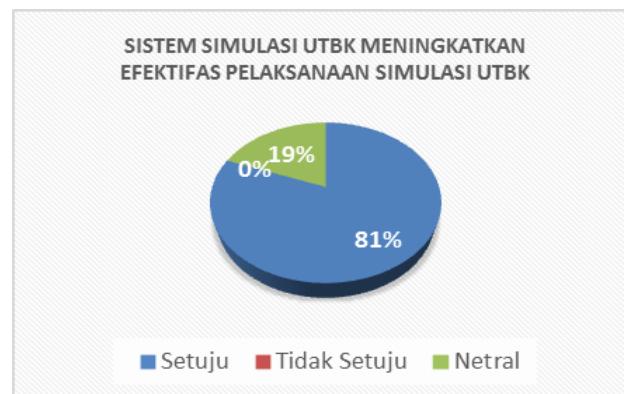


Figure 14. Results of System User Survey Analysis Regarding the Effectiveness of UTBK Simu

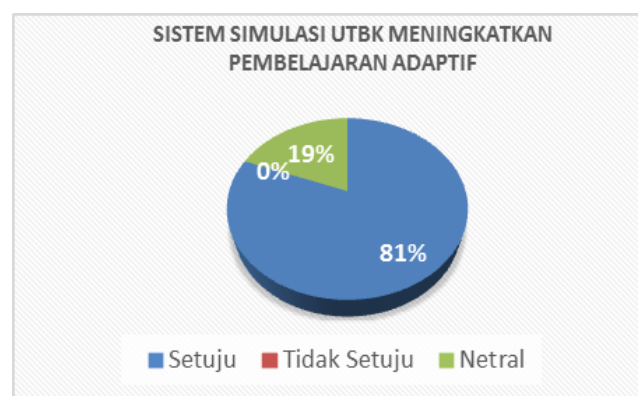


Figure 15. Results of System User Survey Analysis Regarding Increasing Student Adaptive Learning

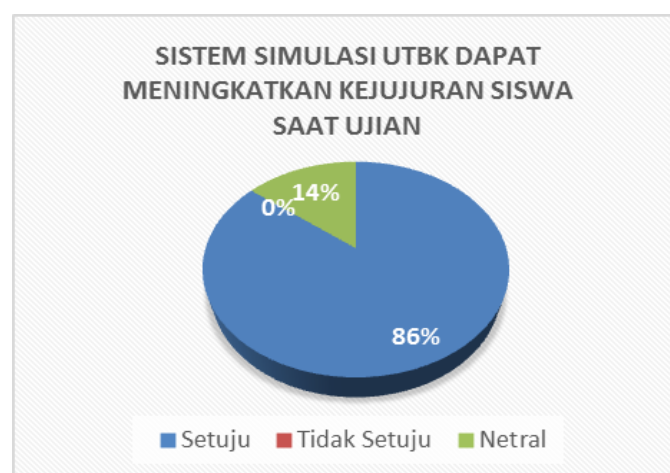


Figure 16. System User Survey Analysis Results Regarding Increasing Student Honesty During Exams

CONCLUSION

This community service is based on the problems faced by MA Al-Azhar Asy-Syarif in preparing the UTBK simulation which is carried out every week. As a solution, the service team built a UTBK simulation system based on adaptive e-learning which can be utilized by teachers and students at MA Al-Azhar Asy-Syarif so that the implementation of the UTBK simulation can run effectively and with quality. Teachers can use this application to manage exam questions and automatic grading to obtain student work results and can produce analysis reports regarding student abilities, especially for each subject tested. The system was built using Moodle LMS by making settings according to needs. The application is built on a Virtual Private Server (VPS). The VPS used is adjusted to the partner's needs, namely around 250 students. The system was built on the domain <https://tryoututbk.my.id> and is by the system development plan where the system must-have features such as simulation settings, user management settings, question bank management features and UTBK management features. Based on the survey, the majority of respondents using the system, namely 81%, agreed that the UTBK simulation system that was built could increase the effectiveness of implementing the UTBK simulation and also improve students' adaptive learning, while 19% expressed a neutral opinion. Respondents also provided a survey regarding the UTBK system based on adaptive elearning which can increase students' honesty in carrying out exam simulations. This is because the system built has a save browser exam feature and randomization of questions.

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