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Effectiveness of Using ALEKS to Provide Personalized Guidance According to the Needs and Abilities of High School Students: Teacher Perspectives

Sabrina Alifah[1], Andika Putra Pratama[2], Wahyunengsih[3]

[1,2,3]Mathematics Education, Syarif Hidayatullah State Islamic University Jakarta
Email: sabrina,alifah24@mhs.uinjkt.ac.id[1], andika.putra24@mhs.uinjkt.ac.id[2], wahyu.nengsih@uinjkt.ac.id[3]

ABSTRACT

This study aims to analyze the effectiveness of using ALEKS in providing personalized guidance according to the needs and abilities of high school students from teachers' perspectives. The research employs a quantitative descriptive method, with data collected through questionnaires with teachers' who have used ALEKS in their teaching. That said, it's not without its issues limited access to technology and the time it takes for teachers to get used to the system can be real hurdles. Still, ALEKS shows promise as a tool for personalizing learning, though schools may need to provide more support to make the most of it.

Keywords: ALEKS, personalized guidance, learning effectiveness, teachers' perspective, educational technology

ABSTRAK

Studi ini bertujuan untuk menganalisis efektivitas penggunaan ALEKS dalam menyediakan bimbingan yang dipersonalisasi sesuai dengan kebutuhan dan kemampuan siswa sekolah menengah dari sudut pandang guru. Penelitian ini menggunakan metode deskriptif kuantitatif, dengan data yang dikumpulkan melalui kuesioner dengan guru yang telah menggunakan ALEKS dalam pengajaran mereka. Meskipun demikian, ada beberapa masalah, seperti keterbatasan akses ke teknologi dan waktu yang dibutuhkan guru untuk terbiasa dengan sistem tersebut yang dapat menjadi kendala nyata. Namun, ALEKS menunjukkan harapan sebagai alat untuk mempersonalisasi pembelajaran, meskipun sekolah mungkin perlu memberikan lebih banyak dukungan untuk memanfaatkannya secara maksimal.

Kata Kunci: ALEKS, bimbingan personal, efektivitas pembelajaran, perspektif guru, teknologi pendidikan

INTRODUCTION

In modern education, Personalized learning is gaining more attention as educators look for better ways to support students with different academic needs, especially in mathematics education. One common challenge in this field is that lessons are often delivered in the same way to all students, without considering their individual learning preferences. This can make it difficult for some students to keep up or fully understand important mathematical concepts (Smith and Johnson 2023). Digital platforms enable adaptive pacing and scaffolding for students with varying skill levels (Lee & Gomez, 2022). As a solution, ALEKS (Assessment and Learning in Knowledge Spaces) is an Intelligent Tutoring System designed to improve mathematics achievement by providing a personalized learning experience. It assesses students' knowledge and tailors instruction to meet individual learning needs, especially for struggling students (Khazanchi, 2021).

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The journal Artificial Intelligence in Education supports this by highlighting two things: ALEKS personalized learning based on analyzing students' abilities and guides them to solve mathematical problems step by step to improve understanding. This confirms the role of ALEKS as an adaptive and effective learning platform (Okhanashvili, 2024). Adaptive learning systems leverage AI to track and respond to learners' evolving needs (Foster & Wang, 2024).

The integration of digital learning tools such as ALEKS in schools cannot be separated from the role of teachers as the primary users. Although various studies have shown the effectiveness of ALEKS in improving student learning outcomes, most of them focus on academic achievement or student experience rather than on its implementation from the teacher's perspective. Teacher readiness is a critical determinant in the success of educational technology adoption (Norris et al., 2023). Even the most advanced tools require human facilitation for effective integration (Tanaka, 2021). In practice, the success of using learning technologies such as ALEKS is highly dependent on the readiness and perception of teachers as parties who integrate this system into teaching and learning activities (Gupta, 2024). Teachers play an important role in choosing usage strategies in assessing their effectiveness in meeting individual learning needs. However, little research has specifically explored teachers' perspectives on using ALEKS at the secondary school level in Indonesia. Understanding teacher perceptions is crucial to optimizing using technology in supporting personalized learning (Evans, 2024).

This study aims to evaluate the effectiveness of using ALEKS from a teacher's perspective in providing personalized tutoring for high school students and contributing to the development of technology-based learning strategies. Teacher feedback on AI-driven tools remains essential in measuring true classroom impact (Ramirez & Bui, 2024). Data from teachers provides context to quantitative system reports (Harris et al., 2022). Teachers reported that ALEKS was user-friendly and useful for instructional purposes, allowing for effective assessment through quizzes and assignments (Kumor et al., 2024). The system supports the development of critical 21st-century skills by fostering a personalized learning environment that encourages problem-solving and collaboration (Surur et al., 2024).

It's not easy to measure how well ALEKS works in Indonesia without thinking about the real conditions in schools. Some places still struggle with tech access, and not all teachers feel equally prepared to use digital platforms. On top of that, the local curriculum often has its own demands. These kinds of things affect how tools like ALEKS are actually used day to day. Examining the effectiveness of ALEKS (Assessment and Learning in Knowledge Spaces) in Indonesia is critical because of the country's unique educational challenges, including limited access to technology, varying teacher competencies, and specific curriculum needs. Understanding these factors can help tailor ALEKS to better serve Indonesian students and educators. Local context and teacher involvement are pivotal in the successful deployment of EdTech (Nugroho & Sari, 2023). Many schools in Indonesia, especially in remote areas, face significant barriers to technology access, which limits the adoption of digital learning tools such as ALEKS (Suharningsih & Fathoni, 2025). The digital divide exacerbates educational inequalities, making it important to address infrastructure issues before fully integrating ALEKS into the curriculum (Rahmadani et al., 2023).

The descriptive quantitative approach was chosen in this study because it can provide a systematic and measurable picture of teachers' perceptions of the effectiveness of using ALEKS in personalized learning. Quantitative research with questionnaire instruments is widely used to assess the adoption of educational technology because it is

considered efficient in collecting data on a large scale and can provide accurate numerical insights (Zhou et al., 2021). Questionnaire-based studies are suitable for gauging large-scale perceptions (Miller, 2021). Quantitative tools help measure subtle trends in technology adoption (Chen & Rinaldi, 2022). In addition, this method also allows researchers to identify technology utilization patterns based on teachers' responses as the main users in the classroom (Rahmawati & Suryani, 2022). Therefore, the questionnaire is considered an appropriate tool to evaluate the role of ALEKS in supporting students' learning needs and abilities based on the perspective of educators.

RESEARCH METHODOLOGY

This research design uses a quantitative approach because it aims to describe the effectiveness of using ALEKS in learning periodically and measurably. The description is presented in the form of a questionnaire given to teachers to test the effectiveness of using ALEKS in learning from the teacher's perspective. This research was conducted in April 2025 at SMAN 48 Jakarta which has implemented a technology-based learning system including ALEKS. The subjects in this study were teachers who teach at SMAN 48 Jakarta, a total of 15 mathematics subject teachers at SMAN 48 Jakarta. The research subjects were selected by considering that the subject teachers had experience using ALEKS for at least one semester.

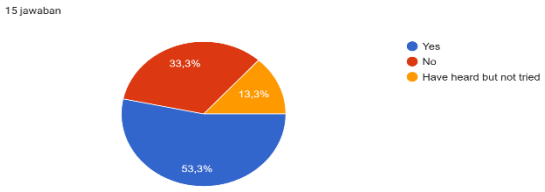
The research instrument used a questionnaire, consisting of 20 questions related to the effectiveness of using ALEKS. The questionnaire form consists of 5 Likert scales. The questionnaire measures five main aspects, namely ease of use, pedagogical effectiveness, personalization of learning, support for students, and benefits for teachers. Before being used, the instrument had been validated by an educational technology lecturer and one senior teacher in detail, the validation results concluded that all questions were suitable for use with slight modifications to the diction. Data collection was carried out through a google form that was sent directly to respondents. Respondents were given 5 days to fill out the questionnaire independently.

Furthermore, the data obtained from the results of filling out the questionnaire from teachers will be analyzed descriptively quantitatively by calculating the average value of each indicator and presenting it in table form. The results are then interpreted to see the tendency of teacher responses to the use of ALEKS.

RESULT AND DISSCUSION

Result

The questionnaire on the effectiveness of ALEKS usage conducted by teachers at SMAN 48 Jakarta showed that 53.3% of respondents had experience using ALEKS. The following are the results of filling out the questionnaire:



Many teachers said that ALEKS helped students become more independent in their learning. They also noticed it made math easier to grasp, thanks to features like instant feedback and real-time tracking of student progress. Some pointed out that seeing their progress visually through graphs, for example, helped boost students' motivation to keep going.

After that, 53.3% of teachers who have experience using ALEKS in learning also stated that using ALEKS can make the learning process easier because the ALEKS program uses AI to analyze the level of student performance ability. ALEKS makes use of artificial intelligence to adjust learning materials based on what each student needs. It looks at their performance and helps spot which areas still need improvement (Tanashchuk et al., 2024). On top of that, the platform offers a variety of tools that students can explore to keep building their skills. Features like community spaces and expert chat make it easier for them to interact with peers and get extra help when needed, helping create a more encouraging learning environment (Redhu et al., 2024). Therefore, some teachers feel that ALEKS can help teachers in teaching and help students in learning, thereby facilitating the teaching and learning process.

After analyzing the teachers' experiences using ALEKS, the following are the results of the questionnaire filled out by teachers regarding the effectiveness of using ALEKS in learning. The following is the data from the questionnaire result:

Table 1. Average questionnaire completion

No.	Question	Average
1	ALEKS process in stages	3,47
2	ALEKS makes the learning process easier	3,8
3	ALEKS provides useful feedback	3,86
4	ALEKS monitors student progress in real time.	3,33
5	ALEKS identifies student weaknesses	3,93
6	The use of ALEKS supports a learning approach based on formative assessment.	3,66
7	ALEKS increases students' motivation to learn mathematics in a fun way.	3,53
8	With ALEKS, teachers can easily adapt teaching to the needs of each student.	3,6
9	ALEKS helps students with lower math abilities to improve their skills.	3,26
10	Students are more confident in working on the question	3,66
	Overall average	3,61

Most respondents stated "agree" or "strongly agree" on almost all questions. The overall average score was 3.61. Based on what was found in this study, ALEKS seems to support more effective learning because it allows students to move through lessons step by step, at a pace that works for them. Some research even suggests that students' math outcomes can match those taught by expert teachers, even though they rely less on direct help. This kind of independence helps students feel more in control of their learning, which can be a big factor in staying motivated.

Additionally, technology-based education, including ALEKS, has positively impacted student engagement and academic outcomes, fostering active learning and critical thinking skills (Malik, 2023). ALEKS can identify each student's weaknesses, so ALEKS gets a relatively high average score of 3.93. ALEKS uses formative assessments appropriate to the student's current level of understanding, identifying weak areas of understanding for maximum improvement (Morland et al., 2024).

Next is Table 2 of the questionnaire completed by the teacher. With an overall average of 3.67, the majority of respondents answered that ALEKS is easy to use, can be accessed anywhere, and is not individual learning but collaborative or working with a team.

Table 2. Average questionnaire completion

No.	Question	Average
1	ALEKS allows repeating questions that have not been mastered.	3,6
2	ALEKS increases student engagement in mathematics learning	3,66
3	ALEKS prepares tools to help students understand mathematics more deeply.	3,53
4	ALEKS provides a more engaging experience	3,66
5	Using ALEKS can make students more independent	3,6
6	ALEKS helps students with more complex math	3,46
7	ALEKS provides a variety of resources to access at any time.	4,06
8	With ALEKS students can set their learning goals.	3,73
9	Teachers can use data from ALEKS to identify student deficiencies.	3,73
10	The use of ALEKS allows teachers to focus on collaborative learning.	3,73
	Overall average	3,67

Survey results showed that many teachers found ALEKS easy to access, whether in or outside of class, with an average score of 4.06. Some even felt it worked better than face-to-face learning in certain cases. The platform also follows accessibility standards, which helps students with disabilities use it more comfortably. For example, the visual design and tech compatibility are made to support different user needs (Costa et al., 2022). Therefore, ALEKS is more accessible; as (Dubey, 2024) says, ALEKS fosters inclusivity by providing equitable learning opportunities through AI-powered tools that adapt to the diverse needs of students without bias. This ensures that all students can access a personalized learning experience regardless of their background.

However, due to the individualized nature of the learning system, there are challenges such as the English language of instruction, unstable internet connection, and lack of social interaction due to the individualized nature of the learning system. Some teachers mentioned that ALEKS needs some preparation before it can be used smoothly in class. For example, internet problems came up a lot. A few of them said they had to plan around unstable connections. They also had suggestions. Some wished ALEKS included local language options. Others thought a student forum or more variety in practice questions would help keep learners more interested.

Overall, ALEKS is considered a valuable platform for technology-based mathematics learning. Therefore, for further development, ALEKS can be an ideal solution for adaptive, flexible, and personalized learning.

DISCUSSION

The analysis of the research results shows that the effectiveness of using ALEKS in learning at SMAN 48 Jakarta is straightforward to use. from the results, it's clear that the average scores 3.61 and 3.67 fall into the good category. Even so, a few issues remain. For instance, guidance from teachers who are truly skilled in their subjects is still needed to help students grasp the material better. Since the system adjusts to each student's level, it creates a learning path that fits their individual style. By allowing students to learn at a pace that suits them, this personalized approach makes it easier for them to grasp math concepts and avoid unnecessary confusion (Kumor et al., 2024). Through the use of AI, ALEKS builds learning paths that align with where each student currently stands, helping them access material that fits both their level and their learning needs (Bentancor et al., 2024).

These results imply the need for stronger educational policy support in integrating adaptive technology into the secondary school curriculum. Teachers, as the primary implementers of learning, need continuous training and mentoring to maximize the use of platforms such as ALEKS, not only in academic contexts, but also in fostering independent learning characters and students' responsibility for their learning process (Gupta, 2024).

In addition, the results of this study also underline that technologies such as ALEKS have the potential to bridge the learning gap that has been difficult to overcome through conventional methods. In Indonesia which has geographical challenges and inequality in access to technology, a personalized approach through an AI-based system can provide a fairer and more flexible learning alternative; However, for its implementation to be effective and equitable, infrastructure support and curriculum adaptation that includes digital learning technology (Suharningsih & Fathoni, 2025). Therefore, the results of this study can be a starting point for developing more comprehensive teacher training policies and programs, especially in the era of digital education that continues to develop.

The results of filling out the questionnaire with Google form stated that using ALEKS during learning will be very effective. Because the ALEKS learning process is gradual, learning using ALEKS is carried out according to the student's abilities to make the learning process more straightforward. This discussion revealed several shortcomings of using ALEKS, such as lacking internet connections in certain areas and lacking support for local languages. Most users expressed dissatisfaction with unnecessary features that complicate the user experience, preferring a more streamlined interface ("Toward a Unified mHealth Platform: A Survey of Current User Challenges and Expectations," 2023). Solve problems using ALEKS, strengthened by (Patil et al.,2023). Ensuring that all smart home devices are compatible with Aleks is critical. Users should verify device specifications and consider using a smart home hub to streamline integration.

COCNLUSION

Many teachers shared that using ALEKS allowed them to respond better to how students actually learn math. Instead of pushing a single method for everyone, the system let learners move through topics in a way that worked for them. As a result, students were more focused and seemed to understand things more clearly. The flexibility also helped teachers adjust class activities when needed.

Suggestion: future improvements should focus on addressing infrastructure barriers and incorporating localized features. Providing options such as offline mode, multilingual interfaces, and collaborative tools will help ensure ALEKS becomes more accessible to all students, including those in underserved areas To maximize its potential.

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