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User Satisfaction Survey on AI-Based Learning Assessment in the Digital Era: Effectiveness and Challenges

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Abstrak

Studi ini bertujuan untuk mengukur tingkat kepuasan pengguna terhadap sistem penilaian pembelajaran berbasis AI di pendidikan tinggi di era digital, dengan fokus pada efektivitas dan tantangan terkait. Dengan menggunakan metode survei yang melibatkan 62 mahasiswa, studi ini mengidentifikasi lima tingkat kepuasan: Sangat Tidak Puas, Tidak Puas, Cukup Puas, Puas, dan Sangat Puas. Hasil penelitian menunjukkan bahwa mayoritas pengguna merasa puas (35%) dan sangat puas (30%) dengan sistem penilaian berbasis AI. Temuan ini menyoroti beberapa manfaat yang dirasakan, seperti efisiensi evaluasi, umpan balik waktu nyata, dan pembelajaran yang dipersonalisasi. Namun, tantangan terkait akurasi, potensi bias algoritmik, dan masalah etika perlu ditangani untuk memastikan implementasi AI yang adil dan efektif. Studi ini memberikan wawasan bagi para pembuat kebijakan dan pemangku kepentingan dalam mengembangkan strategi implementasi AI yang lebih baik dalam pendidikan.

Kata kunci: penilaian berbasis AI, kepuasan pengguna, efektivitas pembelajaran, tantangan etika, pendidikan tinggi, era digital.

Abstract

This study aims to measure user satisfaction levels with AI-based learning assessment systems in higher education within the digital era, focusing on their effectiveness and associated challenges. Utilizing a survey method involving 62 students, the study identifies five satisfaction levels: Very Dissatisfied, Dissatisfied, Moderately Satisfied, Satisfied, and Very Satisfied. Results show that the majority of users feel satisfied (35%) and very satisfied (30%) with AI-based assessment systems. These findings highlight several perceived benefits, such as evaluation efficiency, real-time feedback, and personalized learning. However, challenges related to accuracy, potential algorithmic bias, and ethical concerns need to be addressed to ensure fair and effective AI implementation. This study contributes insights for policymakers and stakeholders in developing better AI implementation strategies in education.

Keywords: AI-based assessment, user satisfaction, learning effectiveness, ethical challenges, higher education, digital era.

A. Introduction

Rapid advancements in digital technology have transformed various aspects of our lives, including the education sector. One significant development in this field is the integration of Artificial Intelligence (AI) into student learning assessment and evaluation. As the education system evolves to meet the demands of the digital era, it is essential to examine the effectiveness and challenges of AI-based learning assessments (Afrita, 2023; AalSaud, 2021).

Current research has highlighted the potential benefits of AI in educational assessment, such as automated grading, personalized feedback, and real-time analysis of student performance (Calatayud et al., 2021). These advancements have the capacity to enhance the assessment experience by providing timely and consistent feedback, and offering valuable insights into student learning. However, the application of AI in educational measurement also raises significant ethical concerns, including issues of validity, reliability, transparency, fairness, and equity (Bulut et al., 2024).

This paper aims to provide a comprehensive understanding of AI's role in enhancing student educational performance at the higher education level, while also addressing the ethical challenges associated with its implementation.

Existing literature suggests that AI can improve the efficiency and effectiveness of educational systems by streamlining and simplifying learning processes, providing personalized recommendations, and predicting student behaviors (Afrita, 2023). Furthermore, AI-powered tools such as intelligent tutoring systems, automated assessments, and natural language processing have the potential to optimize the educational experience and enhance overall academic achievement (Abbas et al., 2023).

However, the use of AI in educational assessments also raises concerns about algorithmic bias, transparency in decision-making, and the potential to perpetuate inequities. Addressing these challenges requires the development of guidelines and frameworks to ensure the ethical and responsible use of AI in education.

Key considerations in evaluating the effectiveness and challenges of AI-based learning assessment include (Bulut et al., 2024; Abbas et al., 2023; Ayala-Pazmiño, 2023).

- Enhancing personalized learning and feedback: AI-powered tools can analyze student data and tailor learning experiences to individual needs, potentially improving learning outcomes and student engagement (Ayala-Pazmiño, 2023).
- Improving assessment efficiency and consistency: AI can automate the assessment process, provide instant feedback, and deliver more accurate evaluations of student performance (Abbas et al., 2023; Bulut et al., 2024).
- Addressing ethical concerns: Issues such as algorithmic bias, transparency, and the potential reinforcement of inequality must be addressed to ensure fair and equitable use of AI in educational assessments.
- Developing effective implementation strategies: Successful integration of AI in education requires comprehensive policies, teacher training, and ongoing evaluation to ensure its responsible and effective use.

The findings of this study contribute to a deeper understanding of the potential benefits and challenges associated with the use of AI in educational assessment, providing valuable insights for educators, policymakers, and stakeholders to navigate the complexities of this evolving field.

To address these challenges, researchers and policymakers have proposed various strategies, including the development of guidelines and frameworks for the ethical implementation of AI in education.

In conclusion, the integration of AI in educational assessment has significant potential to revolutionize the learning experience and enhance student learning outcomes. However, it is crucial to address ethical concerns and ensure the responsible and transparent use of this technology in the education sector.

Addressing issues of AI bias and fairness: Algorithmic bias and the opacity of AI decision-making processes pose risks that perpetuate inequalities and affect assessment outcomes. Improving the accuracy and efficiency of assessments: AI-based assessment tools can provide instant feedback, automate grading, and offer more accurate evaluations of student performance, potentially reducing the workload for educators. Analyzing the impact of AI on student engagement, learning outcomes, and overall academic performance. However, the integration of AI in educational assessment is not without challenges. Researchers have highlighted the need for effective implementation strategies, teacher training, and ethical considerations to ensure the responsible and effective use of AI technology in higher education. (Bulut et al., 2024) (Abbas et al., 2023)

The purpose of this research paper is to provide a comprehensive analysis of the use of AI in learning assessment, exploring its potential benefits and examining the associated challenges. By reviewing existing literature and empirical studies, this paper aims to contribute to a deeper understanding of how AI tools can be leveraged to optimize educational experiences and outcomes for students in the digital era. (Afrita, 2023) (Calatayud et al., 2021) (Abbas et al., 2023) (Ayala-Pazmiño, 2023).

The integration of artificial intelligence in education has been a growing trend, particularly in the realm of student assessment and evaluation. Artificial Intelligence has the potential to revolutionize assessment methods, enabling automated scoring, rapid content analysis, and personalized feedback through machine learning and natural language processing. (Bulut et al., 2024) These advancements can provide timely, consistent feedback and valuable insights into student performance, thereby enhancing the overall assessment experience. (Bulut et al., 2024)

However, the deployment of AI in education also raises significant ethical concerns regarding validity, reliability, transparency, fairness, and equity. Issues such as algorithmic bias and the opacity of AI decision-making processes pose risks of perpetuating inequalities and affecting assessment outcomes.

Personalized learning systems utilizing AI can adapt the content and pacing to individual students' needs, leading to more engaging and effective learning experiences. (Abbas et al., 2023) AI-based tools can also improve assessments by providing instant feedback and allowing for a more accurate evaluation of student performance. (Ayala-Pazmiño, 2023) Nevertheless, the use of AI in education raises concerns about privacy, bias, and the potential dehumanization of the learning process. (Ayala-Pazmiño, 2023)(Kamalov et al., 2023)

Researchers have explored the various applications of AI in education, such as personalized learning systems, intelligent tutoring systems, and automated assessment tools, and their potential to enhance learning outcomes, engagement, and overall academic achievement. (Kamalov et al., 2023) Existing literature highlights the benefits and challenges associated with AI adoption in education, emphasizing the need for effective implementation strategies, teacher training, and ethical considerations to ensure the responsible and effective use of AI technologies. (Ayala-Pazmiño, 2023) (Abbas et al., 2023)

Personalized learning systems and intelligent tutoring systems powered by AI have shown promising results in improving student engagement, learning outcomes, and academic achievement. AI-based tools can analyze student data and tailor learning experiences to individual needs, offering a more customized approach to education. (Ayala-Pazmiño, 2023) Additionally, AI-powered assessment tools can provide instant feedback and allow for a more accurate evaluation of student performance (Bulut et al., 2024) (Ayala-Pazmiño, 2023).

Yet, the ethical implications of AI in education must be carefully considered. Algorithmic bias and the lack of transparency in AI decision-making processes can lead to unfair assessment outcomes, potentially exacerbating existing disparities in the educational system. Responding

to these concerns, various stakeholders, including educators, policymakers, and organizations, have developed guidelines to ensure the ethical use of AI in education(Mello et al., 2023).

The ethical implications of AI in education must be carefully considered. Algorithmic bias and the opaque nature of AI decision-making processes can lead to unfair assessment outcomes, potentially exacerbating existing disparities in the educational system. In response to these concerns, various stakeholders, including educators, policymakers, and organizations, have developed guidelines to ensure the ethical use of AI in education.(Akgün & Greenhow, 2021)

However, the deployment of AI in education also raises significant ethical concerns regarding validity, reliability, transparency, fairness, and equity. Issues such as algorithmic bias and the opacity of AI decision-making processes pose risks of perpetuating inequalities and affecting assessment outcomes. To address these concerns, various stakeholders, including educators, policymakers, and organizations, have developed guidelines to ensure the ethical use of AI in education. Artificial intelligence in education can also support instruction in mixed-ability classrooms and provide personalized learning experiences, but these applications must be implemented with caution to avoid perpetuating systemic bias and discrimination, Specifically, the risks of using AI in K-12 contexts include perpetuating existing systemic bias and discrimination, perpetuating unfairness for students from mostly disadvantaged and marginalized groups, and amplifying racism (Ma & Jiang, 2023) (Bulut et al., 2024) (Akgün & Greenhow, 2021).

However, the deployment of AI in education also raises significant ethical concerns regarding validity, reliability, transparency, fairness, and equity. Issues such as algorithmic bias and the opacity of AI decision-making processes pose risks of perpetuating inequalities and affecting assessment outcomes. To address these concerns, various stakeholders, including educators, policymakers, and organizations, have developed guidelines to ensure the ethical use of AI in education. While AI in education can support instruction in mixed-ability classrooms and provide personalized learning experiences, these applications must be implemented cautiously to avoid perpetuating systemic bias and discrimination. Specifically, the risks of using AI in K-12 contexts include perpetuating existing systemic bias and discrimination, perpetuating unfairness for students from mostly disadvantaged and marginalized groups, and amplifying racism. (Ma & Jiang, 2023) (Bulut et al., 2024)

The existing literature highlights the potential benefits of AI-driven assessment tools, such as improved accuracy, efficiency, and personalization. AI-based systems can analyze student data and tailor learning experiences to individual needs, offering a more customized approach to education. (Abbas et al., 2023) Additionally, AI-powered tools can enhance assessments by providing instant feedback and allowing for a more accurate evaluation of student performance. (Ayala-Pazmiño, 2023) Furthermore, the use of AI in educational measurement can revolutionize assessment methods, enabling automated scoring and rapid content analysis, which can lead to more timely and consistent feedback.

Despite these potential benefits, the deployment of AI in education also raises significant ethical concerns. The integration of AI algorithms in educational contexts can perpetuate existing systemic biases and discrimination, leading to unfair assessment outcomes for students from disadvantaged and marginalized groups(Bulut et al., 2024)(Akgün & Greenhow, 2021). The opacity of AI decision-making processes and the risk of algorithmic bias pose challenges to the validity, reliability, and transparency of the assessment process.

To address these ethical concerns, various stakeholders have developed guidelines to ensure the responsible and equitable use of AI in education. These guidelines emphasize the importance of transparency, accountability, and fairness in the development and deployment of AI-powered assessment tools(Balta, 2023)(Smuha, 2020).

Despite these promising developments, the integration of AI in educational assessment also presents several challenges. The opacity of AI decision-making processes and the potential for algorithmic bias can lead to concerns about the validity, reliability, and fairness of assessment outcomes. Moreover, the dehumanization of the learning experience and the potential impact on student privacy are also important considerations. (Ayala-Pazmiño, 2023)

To address these ethical concerns, researchers and policymakers have proposed various guidelines and frameworks to ensure the responsible and equitable use of AI in education. These include ensuring transparency in AI decision-making, mitigating bias, protecting student privacy, and fostering collaboration between AI developers, educators, and policymakers. (Ayala-Pazmiño, 2023) (Akgün & Greenhow, 2021) (Bulut et al., 2024)

In conclusion, the integration of AI in educational assessment holds significant potential to enhance personalized learning, improve assessment accuracy, and reduce the workload for teachers. However, the ethical challenges associated with AI-based assessment must be carefully navigated to ensure the fair and equitable evaluation of student performance.(Calatayud et al., 2021)(Ayala-Pazmiño, 2023)

The integration of AI in educational assessment holds significant potential, as it can enhance personalized learning, improve assessment accuracy, and reduce the workload for teachers. However, the ethical challenges associated with AI-based assessment must be carefully navigated to ensure the fair and equitable evaluation of student performance.

B. Methodology

This research aims to measure user satisfaction with AI-based learning assessments in higher education, focusing on the benefits and challenges. With the increasing use of AI in education, understanding user satisfaction levels, perceived benefits, and potential shortcomings is essential for better decision-making (Hooda et al., 2022).

Research Design

This study employs a mixed-methods approach (quantitative and qualitative) to obtain a comprehensive picture of user perceptions regarding AI-based assessments.

Population and Sample

The target population for this research is students in the Primary School Teacher Education program at Southeast Sulawesi University. The sample consists of 62 students selected through stratified random sampling techniques to ensure representation from various disciplines and demographic characteristics.

Research Instruments

Data collection was conducted using survey techniques with a satisfaction questionnaire. This questionnaire was designed to capture user perceptions on several key aspects:

- The effectiveness of AI-based assessments in enhancing learning outcomes and engagement.
- The challenges faced in the implementation and use of AI-based assessment systems.
- Concerns related to data privacy, academic integrity, and ethical issues in the use of AI.

In addition to the questionnaire, semi-structured interviews were also conducted to explore users' in-depth experiences and perspectives regarding AI-based assessment systems.

Data Collection and Analysis

- Quantitative Data: The results from the questionnaire were analyzed using descriptive statistics to identify key factors influencing user satisfaction.

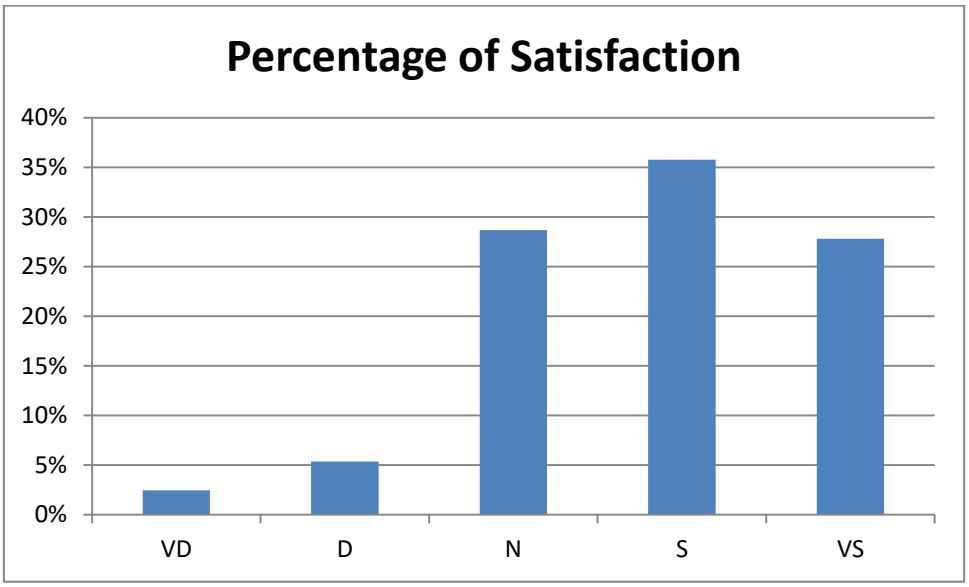
C. Results and Discussion

Result

In the ever-evolving digital era, artificial intelligence (AI) technology is increasingly being applied in various aspects of life, including in the field of education. One important innovation that has emerged is the application of AI in the learning assessment process. AI technology allows for automated assessments, providing real-time feedback, and adapting evaluations based on individual student needs. This makes learning more efficient and customizable to the abilities of each user.

To understand how users respond to the use of AI in learning assessments, a survey was conducted to measure user satisfaction levels. Respondents were asked to rate their experiences using AI-based assessment systems. The survey categorized satisfaction levels into five main groups: Very Dissatisfied (VD), Dissatisfied (D), Neutral (N), Satisfied (S), and Very Satisfied (VS). The results of this survey are presented in the form of bar graphs that show the percentage of satisfaction for each category.

This graph visually illustrates user perceptions of AI-based assessments and provides an overview of how effectively this technology meets users' expectations in the education sector.



Based on the graph above showing the Percentage of Satisfaction with learning, here are the analysis results:
The graph illustrates five categories of user satisfaction levels regarding AI-based learning assessments:

- Very Dissatisfied (VD): This category accounts for about 5%, indicating that a small portion of users feel very dissatisfied with AI-based assessments.
- Dissatisfied (D): The percentage of dissatisfied users slightly increases to around 8%, showing that dissatisfaction exists but remains relatively low.
- Neutral (N): In this category, there is a spike in satisfaction percentage of approximately 25%, indicating that a significant portion of users feel neutral.
- Satisfied (S): With a percentage of about 35%, the satisfied category is the highest, indicating that the majority of users feel satisfied with AI-based assessments.
- Very Satisfied (VS): About 30% of users report a very satisfied level of satisfaction, signaling that AI-based learning is well received by many users.
-

Discussion
The survey results indicate that the majority of users feel satisfied (35%) and very satisfied (30%) with the use of AI-based learning. This suggests that AI technology has a positive impact on the learning assessment process. Most users experience benefits such as speed in providing feedback, efficiency in evaluation, and ease of using technology in a digital environment. According to Gupta & Lee (2022), AI enables improvements in student engagement and personalized learning, significantly enhancing user satisfaction.
However, challenges still arise for some users who feel neutral (25%), dissatisfied (8%), and very dissatisfied (5%). This dissatisfied group may face various challenges often associated with AI-based technology, such as the accuracy of assessment algorithms, limitations in personalization, or concerns about bias and ethics. Anderson & Peters (2023) emphasize that one of the main concerns in AI implementation is the presence of bias in algorithms, which can affect assessment outcomes and students' learning experiences.
Nevertheless, these survey results align with global trends indicating that the effectiveness of AI-based learning is increasingly recognized. Smith & Thompson (2023) found that AI assists in adaptive learning processes that can tailor materials based on individual students' needs. In the context of assessment, AI provides advantages with its ability to analyze large data sets in real-time, facilitating instructors and students in identifying areas that need improvement more quickly.
One of the key factors that make AI technology in learning appealing is its ability to provide faster and more objective evaluations. For instance, through the use of machine learning techniques, AI can detect patterns in students' answers and assess them consistently based on established standards. This not only reduces the time required for grading but also eliminates potential subjectivity in human assessments (Gupta & Lee, 2022).
On the other hand, dissatisfied users may also face issues such as lack of access to technology or digital divides. Research by Smith & Thompson (2023) indicates that although AI has great

potential to expand educational access, significant gaps still exist in technological infrastructure across various regions. This can lead to inequities in the application of AI-based learning, especially in areas with limited internet access or among students less familiar with technology. Ethical and privacy issues also cannot be overlooked. The use of AI in assessments often raises questions related to the collection and use of students' personal data. Anderson & Peters (2023) state that it is essential for educational institutions to establish clear policies regarding how student data is utilized by AI systems, as well as to ensure transparency in the process so that users feel secure and comfortable using this technology.

D. Conclusion

Overall, despite the challenges, the survey indicates that AI-based learning assessments in the digital era are well received by the majority of users. AI's ability to provide efficiency and rapid feedback has significantly increased user satisfaction; however, challenges related to accuracy, bias, technology access, and ethics need to be continuously addressed to enhance the user experience in the future.

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