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Evaluation of Teachers' Perceptions of the Effectiveness of Android Learning Applications in Supporting the Learning Process at School

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Abstract: This research aims to evaluate teachers' perceptions of the effectiveness of Android learning applications in supporting the learning process in schools. This quantitative study adopts a survey approach involving 49 teachers from elementary, junior high, and senior high school levels. The research instrument employs a Likert Scale questionnaire with 13 questions. Data analysis is conducted using a t-test. The results of the data analysis reveal a correlation value of -1.057 between teachers' perceptions and the effectiveness of Android learning applications. Despite the negative correlation, the significance value (sig) of 0.309 indicates no significant difference between teachers' perceptions of the effectiveness of Android learning applications. This suggests that, overall, teachers do not consider Android learning applications as effective tools in supporting the learning process in schools. This research contributes to understanding how teachers perceive Android learning applications and the extent to which these applications are deemed effective. These findings serve as a foundation for further development in enhancing the acceptance and use of Android learning applications in educational settings. Thus, this research can provide guidance for relevant parties to design and implement solutions that better cater to the needs of teachers and students.

Keywords: Teachers' Perception, Effectiveness of Android Learning Applications, Learning Process, School.

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A. INTRODUCTION

Modern education demands the integration of technology as a crucial element to enrich and advance the learning process (Fitriani, 2023). In this context, with the rapid development of information technology, the integration of Android learning applications becomes relevant and strategic in addressing the dynamic demands of education (Nasrullah et al., 2022). The presence of Android learning applications offers an innovative solution to provide a more interactive and profound learning experience (Hidayat, 2020). By harnessing the potential of this technology, education can become more adaptive to students' needs and the ongoing development of the curriculum (Liriwati, 2023). Therefore, a deep understanding of the role of Android learning applications is essential in meeting the expectations and standards of modern education. The alignment of these applications with the dynamics of current education underscores the importance of leveraging technology to enhance the effectiveness of learning at various educational levels (Rohita & Rahmadini Hidayat, 2023). The integration of Android learning applications, as a manifestation of technological progress, enriches the

way education is delivered and received, creating a more dynamic and adaptive learning environment (Paramita, 2020).

Android applications play a strategic role as innovative tools capable of significantly enhancing the quality of education in academic environments (Ardiansyah & Nana, 2020). Their presence has a positive impact on providing innovative solutions that can improve the effectiveness of teaching methods in schools. A profound understanding of the reasons for using Android applications as educational tools in the school context is essential to explore the innovative potential inherent in them (Supardi & Hermansyah, 2023), (Nauko & Amali, 2021). The primary focus in leveraging Android applications as a learning tool is to enhance the quality of the learning process through a more interactive, dynamic, and relevant approach to meet the needs of learners (Ramdani et al., 2021). The innovative potential of Android applications encompasses various features that can be customized to align with curriculum requirements and student characteristics, thereby facilitating more personalized and targeted teaching (Huda, 2022). By comprehensively understanding the reasons and innovative potential of Android applications, educators can optimize their utilization to design higher quality and more relevant learning experiences in the modern era of education (Aziz, 2019).

Teachers as key actors in the learning process, may encounter various challenges arising from their efforts to implement learning technology, particularly in the context of using Android learning applications (Negara et al., 2019) (Permana et al., 2017). In integrating this technology into the teaching process, educators need to address various constraints and obstacles that can impact its effectiveness (Widianto, 2021). One potential challenge is the limited technological knowledge of some teachers, which may hinder their ability to optimize the potential of Android applications (Dwiranata et al., 2019). Additionally, infrastructure aspects and the accessibility of technological devices in schools can be limiting factors affecting successful implementation. Changes in mindset and teaching approaches required to adapt to new technology can also pose challenges for some teachers (Permana et al., 2022). Furthermore, adequate support and training from the school or relevant institutions can play a crucial role in assisting teachers in overcoming these obstacles (Sohiron, 2018). Through a comprehensive understanding of the challenges and obstacles that teachers may face, this research aims to provide a holistic perspective on the dynamics of implementing Android learning applications in the context of education (Islamiyah, 2022).

The primary focus of this research centers on teachers' perceptions regarding the effectiveness of Android learning applications, considering their significant influence on educational practices (Manongga et al., 2022). Understanding how teachers view these applications allows researchers to gain valuable insights into their potential impact on the teaching and learning processes (Hendrik et al., 2023) (Budiono, 2021). This study aims to evaluate the perspectives of both students and teachers regarding the development of Android-based learning media (Kurdi, 2021). Furthermore, the research investigates the validity, practicality, and effectiveness of Android-assisted learning media in enhancing students' critical thinking skills. Additionally, the study explores how the integration of Android-based applications can enhance experimental learning in chemistry education (Syufagi, 2016). Examining teachers' perceptions (Nu'man, 2014).

The implementation of Android learning applications and their impact on the effectiveness of education can be comprehended through a conceptual framework (Putra et al., 2022), (Wiwita et al., 2021), (Mandailina et al., 2019). This framework provides a basis for examining the relationships among variables involved in the utilization of Android-based learning media (Ramadhayanti, 2018). Several studies have employed this framework to develop and test the effectiveness of Android-based learning media in various subjects, such as chemistry, mathematics, and basic concept courses (Mahuda et al., 2021), (Aldira & Syaharudin, 2021). These studies utilized research and development (R&D) methodologies along with quantitative research methods to collect data on student learning outcomes, teacher management skills, student activities, and responses (Santosa et al., 2017). The results of these studies indicate that Android-based learning media can effectively enhance student achievement and provide valuable insights for educators and researchers in promoting sustainable digital learning in higher education (Setyaningsih & Naimah, 2021).

Research on the use of technology in education indicates that technology can significantly enhance students' learning outcomes, particularly in the development of cognitive skills and critical thinking (Davidi et al., 2021). Moreover, the integration of technology can improve the efficiency and effectiveness of the learning process (Kamsina, 2020) (Khaira et al., 2021). However, there are challenges and risks that need to be carefully managed. The experiences of fortunate and less fortunate children differ in terms of internet access, affordability of ICT devices, teacher quality, parental support, and financial sponsorship (Raneo et al., 2022) (Siahaan et al., 2023). Despite these differences, children from various socio-economic backgrounds can leverage technology for learning. The integration of technology in education can contribute to the development of educational policies and the enhancement of the quality of learning in schools (Jelita & Misales, 2022) (Shofyan, 2022). This can bring about instrumental and methodological changes, foster the adoption of new values, and promote social justice. Participatory culture and innovative teaching initiatives become crucial for successful technology integration in schools (Wibowo & Kertati, 2022) (Ulhak & Satriadin, 2023).

The primary objective of this research is to investigate and evaluate teachers' perceptions regarding the effectiveness of Android learning applications as supportive tools in the teaching and learning processes within the school environment. Through a thorough understanding of teachers' views on these applications, this study aims to identify the extent to which Android learning applications can influence teaching and learning practices in the classroom. Through this research, it is anticipated that insights will be revealed regarding how teachers' perceptions shape the acceptance of technology use in the learning context and the extent to which Android applications can significantly contribute to improving educational effectiveness at the school level. The ultimate goal is to provide a deeper understanding of the impact of using Android learning applications in the context of formal education, with the hope of establishing a robust foundation for the development of education policies that are responsive to technological advancements.

B. METHOD

The research methodology employed in this study is quantitative research with a survey approach. The aim of this research is to comprehend and evaluate teachers' perceptions regarding the effectiveness of Android learning applications in supporting the learning process within the school environment. The study subjects consist of 13 elementary school teachers, 20 junior high school teachers, and 16 high school teachers. Data collection is conducted through a research instrument in the form of a questionnaire comprising 13 questions, utilizing a Likert scale with options ranging from strongly disagree (score 1), disagree (score 2), neutral (score 3), agree (score 4), to strongly agree (score 5). This research is carried out through several stages. Firstly, formulating the questionnaire according to the indicators of the research variables. Secondly, distributing the questionnaire to respondents via social media. Thirdly, conducting data tabulation and analysis by applying descriptive statistical techniques and a student's t-test. Lastly, interpreting the data and drawing conclusions based on the results of the data analysis. Data analysis is performed using the JASP software, with the conclusion-drawing criteria that if the Significance (Sig) value is less than 0.05, the null hypothesis (H0) is rejected. This implies that there is an influence or difference in teachers' perceptions regarding the effectiveness of Android learning applications in supporting the learning process in schools.

In conclusion, the research results indicate the presence of an influence or difference in teachers' perceptions regarding the effectiveness of Android learning applications in supporting the learning process within the school environment. This reflects the diversity of views among teachers concerning the extent to which Android learning applications contribute to enhancing the quality of education. These differing perceptions may be influenced by various factors such as technology usage experience, technological proficiency, and contextual needs in teaching. These findings provide a robust foundation for a deeper understanding of the acceptance and adaptation of educational technology among teachers, which, in turn, can shape the direction of more effective and responsive educational policy developments in light of technological advancements in the education sector.

C. RESULTS AND DISCUSSION

This study commenced with the initial phase aimed at exploring the responses of teachers in the West Nusa Tenggara (NTB) region towards the utilization of Android-based learning applications or media to support the learning process in their respective schools. The method employed in this phase involved the distribution of questionnaires to teachers across various education levels, from elementary to high school. The collected responses were then organized and analyzed using Microsoft Excel software. The tabulated results formed the basis for determining descriptive statistics that provide an overview of the general responses of teachers towards the usage of Android-based learning applications or media. The data analysis was subsequently represented in Table 1, offering a comprehensive depiction of the attitudes and perspectives of teachers regarding the use of Android technology in the context of education within schools.

Table 1. Descriptive Statistics

	Male	**Female**
Mean	81.641	84.616
Std. Deviation	13.202	13.115
Variance	174.282	171.993
Range	38.460	46.150
Minimum	60.000	53.850
Maximum	98.460	100.000

Table 1 presents descriptive statistics for the male and female groups in a research study. The mean evaluation score for the male group is 81.641, with a standard deviation of approximately 13.202. The variance reaches 174.282, and the range of evaluation scores spans around 38.460, ranging from a minimum of 60 to a maximum of 98.460. On the other hand, the female group exhibits an average evaluation score of 84.616, with a standard deviation of about 13.115. The variance extends to 171.993, and the evaluation score range is wider, approximately 46.150, ranging from a minimum of 53.850 to a maximum of 100.

From the descriptive results, it is evident that the female group exhibits a slightly higher mean evaluation score compared to the male group. Additionally, the larger range of values in the female group indicates a more diverse distribution of scores among its members. However, the relatively similar standard deviations between the two groups suggest a relatively uniform spread of data within each group. These variables provide an initial overview of the distribution and central tendency of data within each group, forming the basis for further analysis concerning the differences in evaluation scores between males and females in the context of this study. The hypothesis testing results are presented in Table 2.

Tabel 2. Paired Samples T-Test

Measure 1		**Measure 2**	**t**	**df**	**p**
Male	-	Female	-1.057	14	0.309
			Note. Student's t-test.		

Table 2 presents the results of hypothesis testing using a paired sample t-test in the study on the Evaluation of Teachers' Perception of the Effectiveness of Android Learning Applications in Supporting the Learning Process in Schools. The t-test yielded a value of -1.057 with a significance level (sig.) of 0.309. The negative t-test value indicates a decrease in the mean evaluation scores between the conditions before and after the use of the Android learning application. However, the relatively high significance level (0.309) suggests that this difference is not statistically significant.

The interpretation of the t-test value implies that, within the context of this study, there is no significant difference in teachers' perceptions of the effectiveness of the Android learning application before and after its implementation to support the learning process in schools. Despite a decrease in the mean evaluation scores, the high significance may be attributed to inherent variations in teachers' responses to the application. Therefore, these results suggest that the Android learning application may not substantially influence teachers' perceptions

regarding its effectiveness in supporting learning in the school environment. Further analysis and in-depth research are needed to understand the factors that may affect these outcomes and provide recommendations for improving the implementation of the application in an educational context. Subsequently, the author conducted an analysis to determine the level of teachers' responses to each indicator, as depicted in Figure 1.

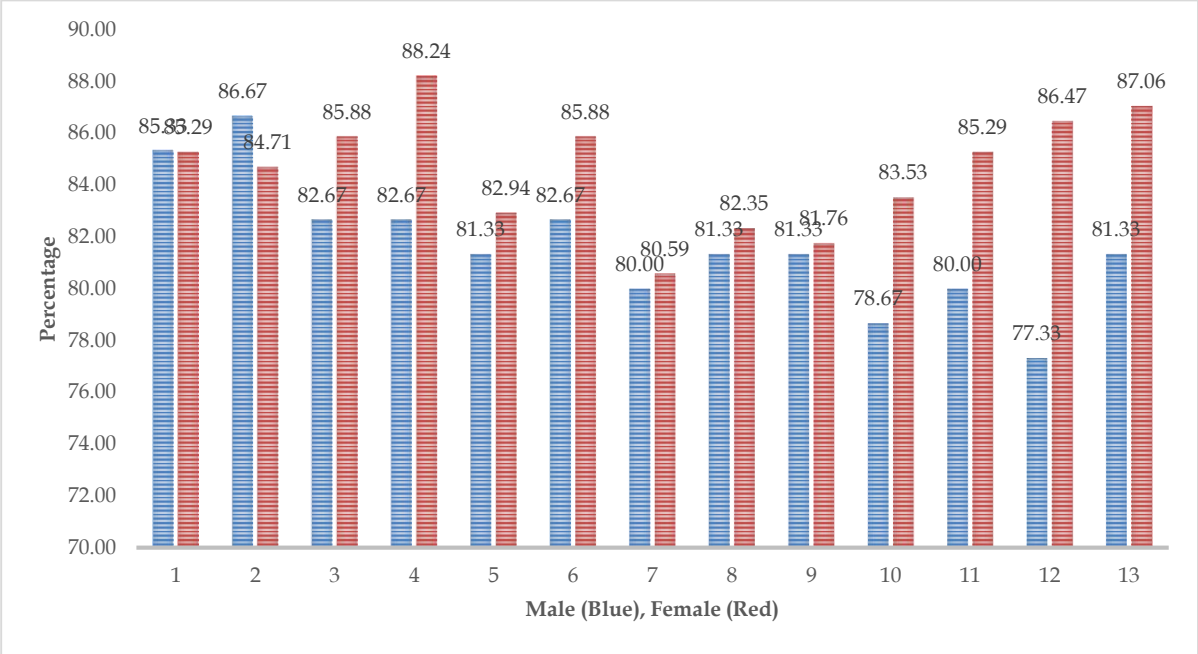

Figure 1. Illustrate the level of teachers' responses to each indicator in the questionnaire.

Figure 1 presents data on the level of teachers' responses to each indicator in the questionnaire, categorized by gender. The average response level for males is 81.64, with a range of values between 77.33 and 86.67. On the other hand, the female response level averages 84.64, with a minimum value of 80.59 and a maximum of 88.24. From the data, it is evident that the female response level tends to be higher compared to the male response level regarding the provided questionnaire indicators. The higher average in the female response level indicates that female teachers provide more positive feedback on these indicators (Afrida et al., 2015). This difference may reflect variations in perceptions and responses influenced by certain factors that require further consideration in the context of questionnaire evaluation and development (Qhoiyro et al., 2023). Further analysis of the factors that may influence the difference in response levels between male and female teachers can provide deeper insights into the evaluation and improvement of the questionnaire's effectiveness (Ihsan, 2018).

D. CONCLUSIONS AND SUGGESTIONS

Based on the data analysis results, a t-test value of -1.057 with a significance level (Sig.) of 0.309 was found. The hypothesis testing using a paired sample t-test indicates a decrease in the average evaluation scores between the conditions before and after the use of the Android learning application. The negative t-test value suggests a tendency for a decline in teachers'

perceptions of the effectiveness of the application. However, the relatively high significance (0.309) indicates that this difference is not statistically significant at the commonly used confidence level (α = 0.05). The conclusion drawn from this research suggests that despite a decline in teachers' perceptions of the effectiveness of the Android learning application, this difference cannot be considered statistically significant. Therefore, it can be inferred that the Android learning application has not yet fully demonstrated a statistically significant impact on supporting the learning process in schools, at least in the perception of teachers. A recommendation for further research is to conduct additional investigations to explore the factors causing the decline in teachers' perceptions of the effectiveness of the Android learning application.

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