

Stability Analysis of Dapodik Website: A WebQual Efficiency Model Approach

Hadi Mulyono^{1)*}, Ari Eko Wardoyo²⁾, Luluk Handayani³⁾

¹⁾²⁾³⁾ Information Technology, Universitas Muhammadiyah Jember, Indonesia

¹⁾hadimulyono78@gmail.com, ²⁾arieko@unmuhjember.ac.id, ³⁾lulukhandayani@unmuhjember.ac.id

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Abstract: This study aims to provide a deeper understanding of how Dapodik can play a role in supporting efficiency and improving the quality of education at the primary level. The research methodology adopts qualitative research design using WebQual 4.0 model. A qualitative approach was chosen to gain an in-depth understanding of user experience regarding the stability and effectiveness of Dapodik in the management of educational data. This study involved participants from two leading elementary schools in Jember Regency, Jember Lor 3 State Elementary School and Al Furqon Elementary School. In its analysis, the research instrument covers three main aspects. The findings show fluctuations in usability scores that reflect application access and performance instability. Although Dapodik shows a good focus on search engine optimization with high SEO value and best practices, improvements to the Largest Contentful Paint (LCP) and page structure are needed to improve stability and responsiveness. The results of operator interviews show the adequacy of Dapodik information, however, more attention is needed in understanding the features of the application. User service responsiveness can be improved by minimizing delays in providing guidance. Suggestions for improvement include stabilization of applications and improved understanding of features, while continued research can explore the positive impact of Dapodik in the context of student learning in various educational environments.

Keywords: Dapodik Website, Jember Regency, Webqual 4.0.

INTRODUCTION

Technological progress has brought significant transformations in various aspects of human life. The digital revolution, which began decades ago, continues to change the way we work, communicate and access information (Savitri, 2019). The rapid growth in computing, internet connectivity, artificial intelligence, and sensor technology has opened the door to tremendous innovation. The application of technology in various sectors, including education, health, industry, and government, is increasingly widespread and has a positive impact on efficiency, productivity, and quality of life. The development of mobile technology, cloud computing, big data, and the Internet of Things (IoT) has also helped shape a new era that is highly connected and supported by data (Gitakarma & Tjahyanti, 2022). With these advancements, global challenges can be tackled with more effective solutions, creating new opportunities, and shaping a more dynamic future. In the era of information technology advancement, the role of web applications in supporting the education sector is increasingly prominent (Huraerah et al., 2023).

One application that is the backbone of education administration in Indonesia is Dapodik, an education information system used for teacher and student data management (Waidah & Tarika, 2022). Advances in technology and the availability of various digital services have changed the landscape of educational administration, and website stability is a crucial factor in ensuring the efficiency and sustainability of application use (Aksenta et al., 2023). The presence of Dapodik incarnates as a very relevant and progressive response to the demands of education administration in the digital era (Agustina et al., 2024). By leveraging technological advancements, Dapodik is designed as an integrated solution to efficiently manage teacher and student data (Annida & Syahrani, 2022). Its existence allows educational institutions, especially teachers and education personnel, to access and manage educational information more quickly and accurately (Solechan, 2021).

Dapodik is not only an administrative tool, but also an innovative step to support the effectiveness of education management in Indonesia (Mukhlisa & Kasim, 2021). The presence of this application has a positive impact in minimizing routine administrative activities, so that educators can focus more on learning activities and student development (Mukhlisa & Kasim, 2021). This information system also creates a centralized database, facilitating

*name of corresponding author



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monitoring, evaluation, and strategic planning in policy making at the education level (Agustina et al., 2024). By responding to technological advances through Dapodik, the government and educational institutions in Indonesia can utilize data more effectively, optimize resources, and design more adaptive policies (Solechan, 2021). Thus, Dapodik represents a positive evolution in the utilization of information technology to improve and improve the education sector as a whole (Kumoro, 2019).

Elementary schools in Jember Regency, as an integral part of the education system, have also felt the positive impact of technological advances realized through Dapodik. As an educational information system application, Dapodik is not only an administrative tool, but also a major milestone in managing data related to teachers and students at the elementary school level. With Dapodik, administrative efficiency in elementary schools can be significantly improved. This helps create an educational environment that is more focused on improving the quality of learning and developing learners. Thus, the role of Dapodik not only contributes to operational efficiency, but also has an impact on improving the quality of education in Elementary Schools, which is the foundation for the development of students at the further education level.

With the advancement of technology, Dapodik comes as an integrated solution to manage teacher and student data efficiently (Mustari, 2023). Its existence is a progressive and relevant step in overcoming the demands of education administration in the digital era (Mustari, 2023). This application is not only a routine administration tool but also has a positive impact on the effectiveness of education management in Indonesia (Mukhlisa & Kasim, 2021). Dapodik minimizes routine administrative activities, allowing educators to focus more on student learning and development activities (Zamroni, 2020). With Dapodik, administrative efficiency increases, creating an educational environment that is more focused on improving the quality of learning and developing learners (Nurliati et al., 2023). Seeing the importance of the role of Dapodik in the world of education, research on the stability of Dapodik websites becomes relevant. The output of Dapodik is not only on the efficiency of teacher administration but also has an impact on improving the quality of education in Elementary Schools. Therefore, this research is an important step in understanding and improving the stability of the Dapodik website, which is the main foundation for education data management in Indonesia.

This study also set out in response to the research Adha et al., (2021) which confirms that the perception of usefulness and ease of use affects operator acceptance of Dapodik. This view suggests that expediency and convenience factors are critical to successful Dapodik implementations in response to technological advances. By understanding this view, this study takes a step further by adopting another research model, namely applying WebQual 4.0. This research not only extends coverage to elementary schools in Jember Regency but also provides a more holistic view of the stability and effectiveness of Dapodik in education data management. By involving more schools, this study aims to provide a deeper understanding of how Dapodik can play a role in supporting efficiency and improving the quality of education at the primary level.

In evaluating Dapodik, references include government guidelines for government websites, international web standards and protocols, usability principles, accessibility standards, performance metrics, and security requirements. This evaluation is crucial to ensure that Dapodik meets established criteria regarding usability, accessibility, performance, and security, thus providing optimal services in education data management. By adhering to these foundations, evaluations can be conducted comprehensively to identify strengths and weaknesses of Dapodik and to guide necessary improvement efforts aimed at enhancing the effectiveness and reliability of the website.

LITERATURE REVIEW

The development of educational technology shows its crucial role in the learning process. Agustian (2021) emphasized that educational technology has an inseparable important role in learning, forming an essential unity. Maritsa et al., (2021) See technology as a supporting tool that makes it easier for teachers to deliver material and achieve the desired learning outcomes. Salsabila et al., (2021) Highlighting that educational technology exists to solve learning problems by providing new alternatives and innovations, facilitating the achievement of educational goals. Surani (2019) observing that educational technology has an important role in the era of education 4.0, as seen from the use of educational technology products such as E-learning, learning applications, and self-study platforms that are in accordance with the demands of today's education. Hidayatullah et al., (2023) views that the digital revolution has great potential to change the education landscape in Indonesia for the better. Mumin (2019) predicted that with the influence of globalization, education in the future will become more open, diverse, multidisciplinary, and related to work productivity. Ambarwati et al., (2021) Emphasizing expectations for the use of current technology by all relevant parties in the world of education, including teachers and other educational actors. Thus, the state of the art of educational technology shows a paradigm shift towards the utilization of technology as a major catalyst in achieving the goals of modern education.

Overall, research related to educational technology has revealed a fairly positive role in improving the learning process. Findings from previous studies, as suggested by (Agustian & Unique, 2021; Ambarwati et al., 2021;

Hidayatullah et al., 2023; Maritsa et al., 2021; Mumin, 2019; Salsabila et al., 2021; Surani, 2019), providing a view that reinforces the urgency of utilizing technology in the context of modern education. However, there is a need to emphasize the administrative aspect of teachers, which has been under-highlighted in previous studies. Previous studies have rarely examined the specifics of the implementation of educational administration technology, especially in the use of Dapodik. Therefore, this study is expected to make an important contribution by investigating the undertouched aspects. Thus, it can be concluded that this research is expected to provide additional insights related to the implementation of educational technology, especially Dapodik, which can be the basis for further development, especially in terms of teacher administration.

METHOD

This study adopts qualitative research design using WebQual 4.0 model. A qualitative approach was chosen to gain an in-depth understanding of user experience regarding the stability and effectiveness of Dapodik in the management of educational data. WebQual 4.0 model applied as the main framework in measuring the quality and satisfaction of users with the website (Setiyani et al., 2020). The research instrument covers three main aspects. First, to measure ease of use, the performance of the Dapodik website will be measured using Google PageSpeed Insights and GTMetrix software. Secondly, to evaluate the quality of information, in-depth interviews with school Dapodik operators will be conducted, and the results will be interpreted and analyzed using tables. Third, the quality of service interaction will be evaluated through in-depth interviews with school Dapodik operators, and the data obtained will also be interpreted with a tabular model to facilitate understanding.

The robustness of Webqual and Google PageSpeed Insights combined with GT Metrix makes them implemented in this study due to their well-established methodologies validated by previous research, demonstrating their ability to provide in-depth insights into the quality and performance of websites. Webqual testing focuses on user experience and satisfaction, while Google PageSpeed Insights and GT Metrix assess technical aspects and performance of the website. The selection of these two software tools is intended to provide definitive guidance and conclusions to avoid bias in the results, ensuring they can corroborate each other as supportive evidence. By integrating both methodologies, this research aims to offer a comprehensive perspective on the usability, performance, and user satisfaction regarding Dapodik.

This study involved participants from two leading elementary schools in Jember Regency, namely Jember Lor 3 State Elementary School and Al Furqon Elementary School. The selection of this sample is based on the consideration that the two schools are considered suitable to be representative samples. Jember Lor 3 State Elementary School and Al Furqon Elementary School were chosen because of their reputation as excellent schools in Jember Regency. In addition, this sampling is also based on considerations to include representation from public and private schools in Jember Regency, so that the results of the study can provide a more holistic picture of user experience of Dapodik in managing education data in elementary school environments. The participation of these two types of schools is expected to provide richer and more balanced insights regarding the effectiveness and stability of Dapodik in the educational context in Jember Regency. The data obtained will be analyzed systematically, and the findings will be presented in the form of visual tables. This research method is expected to provide comprehensive insights into user experience related to the stability and effectiveness of Dapodik in the context of education data management in Jember District Elementary Schools.

This study will involve Dapodik operators from the selected schools, with each school having one Dapodik operator as a participant. The aim is to deepen the perception of these Dapodik operators by providing in-depth questions related to Dapodik. Each Dapodik operator will be given a 40-minute interview session to provide comprehensive insights. Subsequently, the researcher will correlate the interview findings with the results of the real tests conducted using the previously mentioned software tools. This approach is intended to obtain definitive answers and determine whether the findings will mutually support each other.

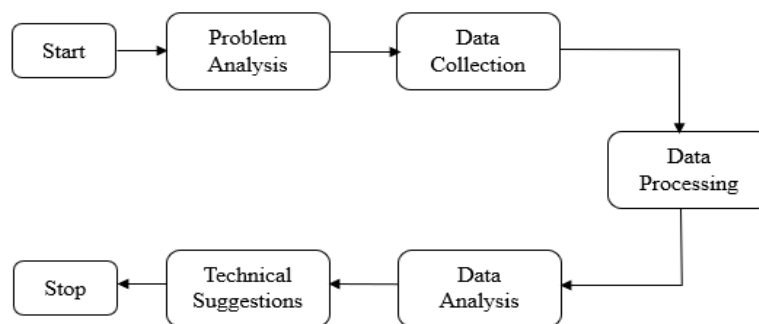


Figure 1. Research Design

*name of corresponding author



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RESULT

Usability

Usability test is used to evaluate the ease of use (usability) of the Dapodik website, performance testing is carried out using two software, the software is Google PageSpeed Insights and GTMetrix. The evaluation is conducted at the selected sample schools during regular school hours, as it is believed that during these times, the Dapodik website will be accessed by a significant number of users. This is essential to evaluate the stability of the website during peak usage periods. Google PageSpeed will be tested initially, followed by GTMetrix, to validate the accuracy of the data obtained. This sequential testing approach aims to enhance the accuracy and reliability of the evaluation results. The test results provide an idea of how well the Dapodik website can be accessed and used by users. The results can be seen in the figure below.

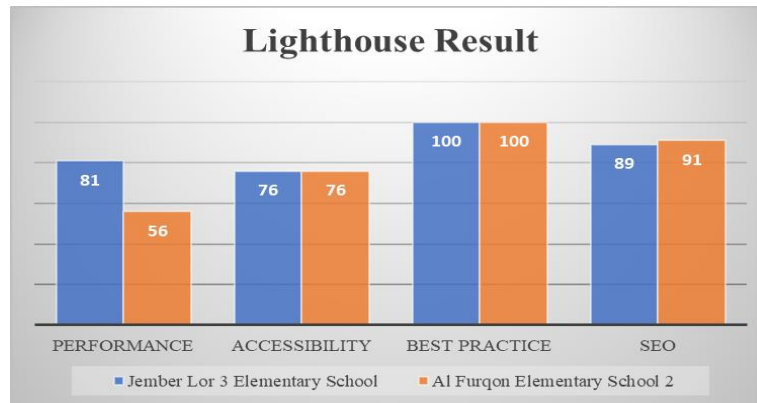


Figure 2. Dapodik Website Lighthouse Performance Result

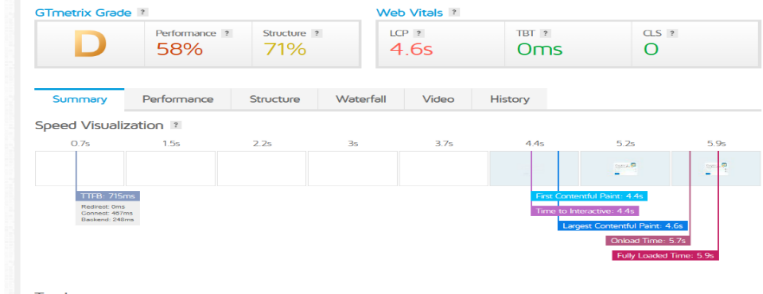
Figure 2 shows the results of the Dapodik website performance test in two sample elementary schools in Jember Lor 3 State Elementary School and Al Furqon Elementary School. The test results showed fluctuations in score gain, highlighting the instability when the website accesses its use. Jember Lor 3 State Elementary School obtained a performance score of 81, with an accessibility score of 76, best practice 100, and SEO 89. Meanwhile, in the same test, Al Furqon Elementary School obtained a performance score of 56, with an accessibility score of 76, best practice of 100, and SEO of 91. The difference in scores between the two elementary schools indicates the instability that occurs in the access of the Dapodik website during its use in two different school environments. This can be an indication that the performance and stability of the Dapodik website still have variations that need attention, especially in the context of use in elementary school environments.

Table 1. GTMetrix Website Dapodik Performance Results

Elementary School	Result
Jember Lor 3 State Elementary School	

*name of corresponding author



Elementary School	Result
Al Furqon Elementary School	

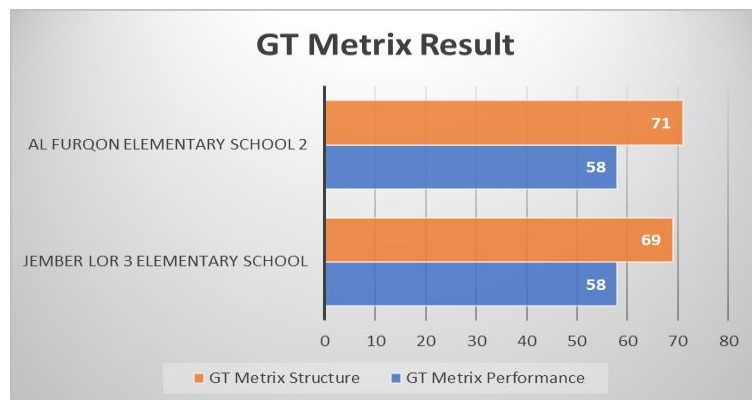


Figure 3. GT Metrix Testing Results Dapodik Website

Table 1 and Figure 3 provide insights into the outcomes of the Dapodik website testing conducted in the two sample schools. Both schools received a D grade, indicating similar overall performance scores of 58. However, there were disparities in the structure values obtained, with Jember Lor 3 scoring 69 and Al Furqon 70. Additionally, the LCP metrics exhibited variations, with respective durations of 4.6s for Jember Lor 3 and 4.9s for Al Furqon. These findings highlight nuanced differences in Dapodik website performance between the sampled elementary schools, suggesting potential factors influencing website stability and performance across diverse usage

Information Quality

Information Quality is used to evaluate the quality of information presented by the Dapodik website. This assessment was conducted through in-depth interviews with the operators of the schools that were sampled where the questions asked were *"What do you think is the quality of the information presented by the Dapodik website and do you believe that Dapodik brings efficiency in managing educational data in schools, and do you think the use of Dapodik has a positive impact on student learning hours?"*. The results of the interview provide insight into the extent to which the information provided by Dapodik is considered useful, accurate, and relevant by users. Data for this assessment were obtained from operators who were given the opportunity to participate as research samples. Operators were provided with a 40-minute interview session, in accordance with the guidelines outlined in the introduction section, conducted at their respective duty locations. In consideration of data privacy, researchers ensured the protection of any private information that could potentially disrupt their activities and duties.

Table 2. Interview Results Related to Dapodik Information Quality

Elementary School	Result
Jember Lor 3 State Elementary School	<i>"In my opinion, the quality of information presented by the Dapodik website is quite good. Provide fast and accurate access to education data in schools. I believe</i>

*name of corresponding author



Elementary School	Result
	<i>that Dapodik brings efficiency in the management of educational data in schools because it simplifies administrative tasks and minimizes human error. The use of Dapodik positively impacts student learning hours because it allows us to focus on student learning and development activities without being overburdened by complex administrative tasks."</i>
Al Furqon Elementary School	<i>"I see the quality of the information presented by Dapodik is quite adequate, although sometimes extra attention is needed to ensure the data coming in and going out is really accurate. I think there's still room for improvement, especially in terms of a more understanding of existing features. As far as the use of Dapodik has an impact on students' learning hours, I don't think its effect is immediately visible but very relevant in creating a more organized and efficient educational environment."</i>

The interview results related to Dapodik Information Quality from Jember Lor 3 State Elementary School indicate a positive perception, with operators acknowledging the website's fast and accurate access to education data, which enhances efficiency in educational data management and positively impacts student learning hours. Conversely, operators from Al Furqon Elementary School expressed satisfaction with the information quality but highlighted the need for improved data accuracy and a better understanding of features. While they did not perceive an immediate impact on student learning hours, they recognized the potential for Dapodik to contribute to a more organized and efficient educational environment.

Service Interaction Quality

Service Interaction Quality is an important aspect in evaluating user experience of the Dapodik website. In this analysis, interviews with school Dapodik operators became a decisive indicator to understand the extent of the quality of service interactions provided by the application, the question asked was ***"As a school operator, how was your experience in accessing Dapodik features? Have you ever faced difficulties and asked questions to Dapodik user service? How did you respond, and do you think the service provided an adequate solution to the problem at hand?"***. This in-depth interview provides first-hand insight into how school operators interact with Dapodik, exploring ease of use, the app's responsiveness to their needs, and the extent to which Dapodik can meet their expectations in terms of services and interactions provided. Utilizing the remaining time within the same interview session as the previous discussions, the results revealed in table 4

Table 3. Interview Results Related to Dapodik Service Interaction Quality

Elementary School	Result
Jember Lor 3 State Elementary School	<i>"I have experienced difficulties when accessing certain features in Dapodik, especially related to data management. However, I always try to understand more and find solutions on my own. I've also asked Dapodik user services via email, and I feel the response I've received is quite adequate. Although it may take a little time to get answers, but they provide helpful guidance."</i>
Al Furqon Elementary School	<i>"I have faced difficulties when using Dapodik, especially related to inputting teacher data. I tend to question the issue to the Dapodik user service officer. The response I have received so far is quite satisfactory. They gave me clear answers and helped me solve the problem. Although it took a few questions, I found Dapodik's user service quite responsive and helpful."</i>

*name of corresponding author



Table 3 presents the interview results regarding Dapodik Service Interaction Quality in two elementary schools. The operator from Jember Lor 3 State Elementary School encountered difficulties accessing certain features, particularly related to data management, yet they made efforts to understand more and find solutions independently. They also reached out to Dapodik user services via email and found the responses satisfactory, despite some delay in receiving answers. Conversely, the operator from Al Furqon Elementary School faced challenges, especially regarding inputting teacher data. They tended to address these issues with Dapodik's user service officers and found the responses clear and helpful in resolving the problems. Despite requiring multiple questions, they perceived Dapodik's user service as responsive and supportive.

DISCUSSIONS

Usability tests conducted using Google PageSpeed Insights revealed fluctuations in performance scores in two sample elementary schools, namely Jember Lor 3 and Al Furqon. While Jember Lor 3 showed a higher performance with a score of 81, Al Furqon trailed with a score of 56. Variation in scores signifies instability in Dapodik accessibility and performance during use in different school environments. This emphasizes the need for more attention to improving stability and performance, especially given the diverse context of use in Elementary Schools. Although accessibility, best practice, and SEO scores are relatively high, there is still potential to improve performance and accessibility. Possibly, some elements or features in Dapodik can be further optimized to ensure optimal responsiveness and speed. In both schools, high SEO scores (89 and 91 respectively) indicate that Dapodik has taken good care of the principles of search engine optimization. Proper use of tags, informative meta descriptions, and image optimization are factors that support improved SEO. This means that Dapodik has the ability to appear higher ranked in search results, increasing its visibility among users. The use of GTMetrix provides a further understanding of Dapodik's stability and performance. The sequential structure values, 69% and 71%, indicate that the structure of web pages in Dapodik can be improved to achieve more optimal performance. Largest Contentful Paint (LCP) is a metric that measures the time it takes to render the largest element on a web page. In both schools, LCP values of about 4.9 seconds and 4.6 seconds indicate that there is a delay in loading critical elements. The effect is on the experience of users who may face delays in accessing important information. Improvements to LCP can result in a more responsive user experience and ensure better access stability. A comparison of the usability test results with the two software highlights that Dapodik has implemented best practices well, and its high SEO value indicates a focus on search engine optimization. However, improvements to LCP and page structure can have a positive impact on application stability and responsiveness, ensuring an optimal user experience.

Assessment of information quality through in-depth interviews with school operators provides a nuanced perspective. Operators from Jember Lor 3 expressed satisfaction with the quality of Dapodik's information, highlighting its fast and accurate access to education data. In addition, the operator believes that Dapodik brings efficiency in data management, minimizes administrative errors, and has a positive impact on student learning hours. On the other hand, Al Furqon operators acknowledged the overall adequacy of information quality but suggested improvements, especially in understanding the various features. Nonetheless, they recognize the indirect influence of Dapodik in creating an organized and efficient educational environment.

The quality of service interactions, evaluated through interviews, reveals operator experience in accessing Dapodik features and seeking assistance from user services. The operator from Jember Lor 3 encountered difficulties and contacted user service by email. While acknowledging the delay in response, they appreciated the guidance provided. Likewise, Al Furqon operators face challenges in inputting data and finding the user service responsive and helpful, even with a few questions. The findings highlight the responsiveness of Dapodik user services and their role in helping operators overcome challenges.

The identified variations in usability, information quality, and service interaction quality confirm the importance of continuous improvement in Dapodik. Addressing stability issues, improving information presentation, and ensuring responsive user service are crucial to improving the user experience in a variety of elementary school environments. In addition, recognition of positive impacts, such as increased administrative efficiency and indirect contributions to student learning, reinforces the significance of Dapodik in the educational landscape. Overall, this multifaceted evaluation provides a thorough understanding of Dapodik's performance, laying the groundwork for further improvement. These findings not only shed light on existing challenges, but also highlight Dapodik's potential to positively influence basic education through effective data management.

CONCLUSION

A thorough evaluation of Dapodik in two elementary schools, Jember Lor 3 and Al Furqon, provides a complex picture of Dapodik performance in the context of education data management. In evaluating Dapodik performance in Jember Lor 3 and Al Furqon elementary schools, the findings showed fluctuations in usability

*name of corresponding author



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scores reflecting instability of access and application performance. Although Dapodik shows a good focus on search engine optimization with high SEO value and best practices, improvements to the Largest Contentful Paint (LCP) and page structure are needed to improve stability and responsiveness. The results of operator interviews show the adequacy of Dapodik information, however, more attention is needed in understanding the features of the application. User service responsiveness can be improved by minimizing delays in providing guidance. Suggestions for improvement include stabilization of applications and improved understanding of features, while continued research can explore the positive impact of Dapodik in the context of student learning in various educational environments.

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