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THE EFFECTIVENESS OF USING CHROMEBOOKS AS LEARNING MEDIA IN PAI AND CHARACTER EDUCATION ASSESSMENT ACTIVITIES

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ABSTRACT

This study aims to evaluate the effectiveness of using Chromebooks as a learning medium in the PAI (Islamic Education) and Character Education assessment activities at SDN 90 Seluma, Bengkulu Province. The research adopts a mixed-method approach, combining quantitative and qualitative data. The research results indicate that using Chromebook media in these assessment activities has proven effective. Quantitative data shows that the Chromebook's effectiveness is reflected in high accessibility (84%), interactivity (85%), and real-time feedback (84%). Meanwhile, in the PAI and Character education assessments, the ability to analyse data reached 81.2%, and personalisation and flexibility were at 79.52%. Qualitative data further support these findings, demonstrating that Chromebook media allows for efficient, smooth, and interactive assessments, significantly enhancing student motivation. The study concludes that Chromebooks are an effective tool for improving the quality of learning and assessment in modern education.

Keywords: Chromebook, Learning Media, assessment, Islamic education, Character education

INTRODUCTION

The education curriculum is understood as a collection of plans and regulations for objectives, content, and methods of learning. It also serves as a guiding framework to realise learning activities aimed at achieving specific goals. Evaluation of education is an essential part of decision-making about teaching and educational policies (Anderson & Dron, 2017). Education policymakers and curriculum developers can establish and implement policies that improve the educational system and curriculum model based on the results of curriculum evaluation (Darling-Hammond & Adamson, 2019). Teachers, school principals, and other educational practitioners can also use curriculum evaluation results to determine student development, select teaching materials, methods, and assessment techniques (Brown & Smith, 2018).

Evaluation is a systematic and continuous process of determining quality, value, and significance based on specific criteria and methods, which must be followed with appropriate decisions (Frey & Allen, 2017). Evaluation can be seen as a methodological procedure to assess the relevance of subjects based on specific criteria, focusing on assigning values to

evaluate student learning outcomes, to determine whether students have achieved their skills and are considered capable when new educational policies are made and to measure the success of the material delivered in class (Cohen & Matthews, 2020). Practical evaluation is crucial for understanding existing skills and determining learning outcomes; hence, effective teaching greatly depends on it (Puentedura, 2020).

The purpose of the evaluation is to determine whether the teacher's teaching process has been completed. Evaluation can inspire students to be more involved in their learning process and help teachers and schools improve the quality of their teaching (Selinger & Cochrane, 2023). Evaluation is a standard method for collecting information and data through decision-making and analysing teaching experiences, including educational programs, learning plans, teaching strategies, and other academic practices (Jonassen & Land, 2020). The assessment system serves as a method to improve the quality of the educational process and outcomes, contributing to the enhancement of academic quality (Zhang & Yang, 2025).

In one aspect, students must demonstrate their knowledge and competence through evaluation. On the other hand, evaluation can provide students with opportunities to learn and practice critical thinking as they grow during the learning process (Williams, 2021). In the independent curriculum system, evaluation is known as "Assessment." Assessment is a systematic process or activity to collect information about the teaching and learning process to help make decisions based on specific criteria and comparisons (Huang & Trifonova, 2022). In this era, the rapid development of knowledge, technology, information, and communication is particularly evident in the technology sector (Alexander & Nguyen, 2017). Initially used for communication purposes, technology can now be used in education (Puentedura, 2020). Technology in education has moved beyond being just a physical tool for learning to embody a multidimensional concept as defined by the Association for Educational Communications and Technology: "Educational technology is the ethical study and practice of creating, utilising, and managing appropriate technological processes and resources to facilitate learning and enhance performance" (Williams, 2021).

Education is one of the many fields of life that has been affected by the growth of information and technology (Jonassen & Land, 2020). Teachers must design a learning experience for students that is engaging, varied, repeated, and evolving (Zhang & Yang, 2025). Teachers can use media for instruction, including tools or instruments that deliver information and facilitate the presentation of materials in visual, audio, or audiovisual formats to enhance student interest and improve their learning motivation (Freeman & Williams, 2022). Effective use of the right technology can improve the learning atmosphere (Selinger & Cochrane, 2023). Technology-based education can form interactive patterns that engage students more

effectively (Cohen & Matthews, 2020). Technology-based teaching represents a new and rapidly developing field of educational technology. The evolution of technology in education has become more prominent. Therefore, the use of educational tools, technology support systems, and school infrastructure must be aligned with technological developments to create a more enjoyable learning process (Frey & Allen, 2017).

The revolution in knowledge and technology, changes in society, understanding of children's learning styles, and the growth of media and communication have provided new meaning to educational activities (Darling-Hammond & Adamson, 2019). These advancements highlight the importance of integrating technologies into educational management and learning (Puentedura, 2020). Additionally, educational media can stimulate the sensory experiences of seeing, hearing, touching, and smelling, which contribute to a richer learning experience (Huang & Trifonova, 2022). Teachers must use these tools to ensure that students effectively understand the learning material (Williams, 2021).

A Chromebook is a tool similar to a laptop, featuring a touchscreen interface and online capabilities. It serves as an educational medium for students, providing them with the opportunity to study material through their student accounts in the Kemendikbud system (Zhang & Yang, 2025). Learning through the use of this media can increase student attention, which in turn can boost their learning motivation (Freeman & Williams, 2022). Chromebook proves that technology can make learning easier, more practical, and effective in achieving educational goals (Cohen & Matthews, 2020). Based on previous research results, there are several advantages of using Chromebook in the learning process, including: a) increased student participation, b) students being more willing to explore and ask questions, c) a more engaging classroom environment, d) students being highly motivated and enthusiastic, e) and significant improvement in Mathematics learning outcomes (Frey & Allen, 2017).

According to Jennifer Williams (2021), technology, including Chromebooks, provides students with opportunities to express themselves, collaborate, and create more innovative learning experiences. Williams emphasises the importance of giving students the freedom to explore their learning with tools that support creativity and communication (Alexander & Nguyen, 2017). Based on initial observations, schools with Chromebook facilities have underutilised this media in evaluation or assessment activities, as it is mainly used during exams like the National Competency-Based Assessment (ANBK). Once the exam activities are completed, the Chromebook is no longer used. However, SDN 90 Seluma in Seluma Regency is one of the schools that actively uses Chromebooks as part of the learning process. Although Chromebook use has been limited to certain teachers for learning and assessment

activities, it continues to be employed for some assessments, particularly in PA&I and Character education lessons (Selinger & Cochrane, 2023).

Based on the above statements, the researcher aims to evaluate the use of Chromebooks and focus the research on its effectiveness in the PA&I and Character education assessment activities at SDN 90 Seluma, Bengkulu Province.

LITERATURE REVIEW

1. Chromebook

a. Definition of Chromebook

Chromebook is a computing device similar to a laptop or tablet that runs on Chrome OS, developed by Google. Its operating system is lightweight and cloud-based, allowing students to access materials through their Kemdikbudristek learning accounts. By using a Chromebook, students can enhance their learning process, ultimately improving their learning outcomes.

b. Chromebook Components

Chrome OS, as an operating system, is designed to utilise cloud-based applications. This allows the Chromebook to function effectively despite having limited internal storage. Chromebooks do not require powerful processors or ample local storage.

c. Advantages and Disadvantages of Chromebook

1) Advantages: Chromebook has minimal hardware specifications, fast performance, and long battery life. All user data is stored in the cloud, so students' progress will not be lost even when switching devices.
2) Disadvantages: Chromebook is limited in running applications that require significant resources, such as graphic design or 3D modelling applications.

2. Chromebook Usage in Learning Assessment

Assessment is the process of collecting information to measure students' understanding and development during the learning process. In the context of Chromebooks, assessment can be conducted using cloud-based applications, such as Google Forms for quizzes, allowing for fast and responsive feedback.

3. Effectiveness in Learning

Effectiveness refers to the ability of a process or tool to achieve the desired goals correctly and efficiently. In the context of learning, effectiveness refers to the extent to which the learning process produces the desired outcomes.

Several studies have explored the use of Chromebooks in learning and assessment. Research by Khoiriyati Kaulina Rahmaningrum et al. (2024) discusses the use of Chromebooks for learning evaluations, supported by Quizizz in elementary schools, and highlights their role in fostering 21st-century skills among students. Siti Rohmah's research (2024) examines the impact of Chromebooks in junior high schools, where their use of cloud-based applications has been shown to improve student achievement. Uli Astutik's study (2023) focuses on how Chromebook, along with Canva applications, enhances students' digital literacy skills, showing a notable improvement in their ability to operate laptops and access digital resources. In addition, research by Hery Kresnadi et al. (2023) investigates the use of Chromebooks in IPS learning, emphasising their positive effect on student engagement and understanding of the material.

This research focuses on evaluating the use of Chromebooks in PAI learning assessments. Digital technologies, such as Chromebooks, have not only made learning more effective but also facilitated the assessment process. Chromebook serves not only as a tool for accessing learning materials but also plays a key role in assessment activities, providing real-time feedback, data analysis, and digital portfolios. The study aims to assess how the use of Chromebooks can enhance the effectiveness of PAI learning assessments.

METODOLOGY

The Research Methods section outlines the research approach, detailing the research location, data collection process, and data processing methods to achieve the desired results. The research type is mixed methods, which combines both qualitative and quantitative research methods. According to Creswell (2014), mixed methods research is an approach that combines qualitative and quantitative research. Sugi Yono (2013) explains that mixed methods research is a combination of quantitative and qualitative methods used together in a research activity, resulting in comprehensive, valid, reliable, and objective data.

The combination of these two methods offers a more complete understanding of the research problem than using either technique alone. The mixed methods approach integrates assumptions, applications, and mixing of both qualitative and quantitative approaches into a single study. In this research, the primary focus is on the quantitative method, which is complemented by qualitative data for a more comprehensive analysis. The process involves using qualitative data to explain the quantitative data.

The approach used in this research is a comparative analytical approach with a cross-sectional design. This mixed-method research is based on the assumption that collecting

various types of data can provide a deeper and more comprehensive understanding of the research problem. The mixed-method strategy used in this study is an exploratory sequential design. This approach begins with the collection and analysis of qualitative data in the first phase, followed by quantitative data collection and analysis in the second phase, based on the initial qualitative findings.

This research uses the *Exploratory Sequential Design*. In the initial phase, qualitative data is gathered through interviews with respondents, followed by the quantitative phase with the distribution of questionnaires. The focus is on qualitative data, which is then expanded with quantitative methods. This mixed-method approach allows data from both methods to complement each other, strengthening the overall research.

According to Arikunto (2010), research instruments are tools used by the researcher to collect data, facilitating the work and improving the results. The instruments used include observation sheets, interview guides, questionnaires, and documentation.
In this research, data is collected using both qualitative and quantitative methods. Quantitative data is analysed using statistical techniques such as validity and reliability tests. Validity is tested using the Pearson Product-Moment correlation, and reliability is assessed using internal reliability tests (Spearman-Brown and Guttman). The data analysis also includes calculating frequencies and percentages for data categorisation.

For qualitative data, constant comparative methods are used. Data collected through interviews, observations, and documentation are categorised and compared across different sources and groups. Triangulation is used to ensure the credibility of the qualitative data.

Data validity is tested using triangulation to ensure consistency and reliability across different sources. This is particularly important for qualitative data, as triangulation helps identify any inconsistencies and strengthens the overall validity of the research findings.

In summary, this research uses both qualitative and quantitative methods to collect and analyse data, ensuring a comprehensive understanding of the research problem. Triangulation is employed to validate the data and enhance the credibility of the findings.

RESULT AND DISCUSSION

The Research Results section presents the findings based on the research methods described previously. Researchers (writers) must clearly define the research results and assess the strengths and weaknesses to produce accurate findings. To strengthen the research results, supporting photos, scans of documents, pictures, illustrations, tables, or other supporting documents can be included.

A. Qualitative Data Presentation

In this section, the research findings are presented based on data obtained through observations, documentation, and interviews using descriptive study methods. Qualitative data analysis is conducted to analyse the use of Chromebook media in PAI (Religious Education) and Character education learning at SD Negeri 90 Seluma. Interviews were conducted with the school principal, teachers, and students.

The goal of presenting data in this research is to provide an understanding of the implementation of Chromebook media in the learning process at SDN 90 Seluma, Bengkulu Province. Based on the data collected through interviews, observations, and documentation, the researcher was able to describe the findings as follows:

1. Use of Chromebook Media

In this section, the researcher will describe the effectiveness of using Chromebook media for PAI and Character education learning assessments at SDN 90 Seluma. According to the data collected through interviews, observations, and documentation, the researcher describes the findings as follows: One of the crucial aspects that needs to be evaluated in the use of Chromebook media as an assessment tool in SDN 90 Seluma is the willingness and acceptance of the school community, especially the teachers and students. This response reflects accessibility, interactivity, and real-time feedback, all of which influence the adaptation process and the success of Chromebook media implementation in PAI and Character education learning assessments.

a. Accessibility

Based on the results of data collection through interviews conducted at SDN 90 Seluma, accessibility is a key response from the users of Chromebook media, where PAI and Character education teachers explained:

> Chromebooks significantly facilitate students' access to assessments. With a cloud-based platform, students can easily access materials and assignments anytime and anywhere, as long as they have an internet connection. Features like exam applications and Google Classroom also support the management of tasks and assessments more efficiently."

Additionally, one of the students from class VI explained:

"Yes, usually opening the assignments on the Chromebook is quite easy."

Similarly, the School Principal, IR, added:

"Yes, we at the school and I as the principal provide the best facilities for PAI and Character education assessments, one of them by providing Chromebook media. The process started with identifying the technological needs to support the learning process."

Based on the interviews, it can be concluded that using Chromebook media facilitates accessibility for student assessments, which is an essential factor in successful assessment implementation.

b. Interactivity

The flexible and portable design of the Chromebook makes it easier for students to learn and work on tasks anywhere, providing them with greater flexibility in accessing assessments. In addition, the ability to prepare and manage tasks digitally helps students with physical disabilities or others to participate more actively in the learning process. This has resulted in increased interaction between teachers and students during the PAI and Character education learning assessments.

This was also conveyed by a student, BY, from class VI, who stated:

> "Certainly, during several tests or tasks, there are usually choices that can be changed or selected according to preferences or skills. However, these conditions may vary depending on the arrangement of the teacher or exam organiser."

Similarly, BL from class V explained:

> "Students can use presentation applications such as Google Slides or Prezi to create presentations about their projects and then present them virtually in front of the class."

c. Real-Time Feedback

Teachers play an essential role in preparing assessments. The process of preparing assessments begins with understanding the objectives and determining whether the appraisal is a Mid-Semester Exam (STS) or an End-of-Year Evaluation (PAT). Next, creating questions as a guide and preparing the forms digitally, usually in Excel or Word with specific templates. Another important consideration is that the language of the questions and answers should be unambiguous, and the template file size should be aligned to prevent issues during Chromebook media processing.

The ability of teachers to provide real-time feedback to students through Chromebook usage was highly valued, as it allowed students to receive immediate responses to their tasks.

B. Quantitative Data Presentation

In this section, the research results obtained through data analysis using the Mix Method with a sequential explanatory design are presented. This research method combines quantitative and qualitative research methods sequentially, where the first phase

of the research is conducted using a quantitative method, followed by a qualitative method in the second phase to measure the effectiveness of using Chromebook media **in** PAI (Islamic Education) and Character education assessments at SDN 90 Seluma, Bengkulu Province.

The research was conducted with 39 students using proportionate stratified random sampling. The data were collected through questionnaires distributed to respondents who became the sample for this research, and all the completed questionnaires were returned with complete answers. This research was structured in a table format showing the scores for the Chromebook Learning Media (X) and the PAI and Character Education Assessment Activities (Y)**.**

The data presentation in this study aims to understand the overall picture of each variable and indicator. The descriptive data for each variable are presented as follows:

a. Data on the Use of Chromebook Learning Media (Variable X)

The instrument used to measure the effectiveness of using Chromebooks as a learning medium was a questionnaire consisting of 20 items. Each item had five alternative answers with a score range of 1-5. The results of the questionnaire answers from the respondents can be summarised as follows: From the Variable X questionnaire, the mean value was 82.8, the median (Me) was 83, the mode (Mo) was 80, and the standard deviation (SD) was 8.42, rounded to 10. The maximum score obtained was 100, and the minimum score was 66, with a range of 34. The class interval was determined using the formula k=1+3.3log$f_0$nk = 1 + 3.3 \log nk=1+3.3logn, resulting in k=6k = 6k=6. The class interval length was R/k=34/6=5.65, rounded to 6. Therefore, the classified intervals for Chromebook Learning Media Usage are as follows:

Table 1: Distribution of Chromebook Learning Media Frequency

Class	Frequency
65-70	5
71-76	6
77-82	12
83-88	10
89-94	3
95-100	3
Total	39

Based on the frequency distribution table, the Chromebook Learning Media Usage is categorised as medium, with 28 respondents (71.7%), indicating a medium level of effectiveness.

b. Data on PA&I and Character Education Assessment Activities (Variable Y)

The questionnaire for the PAI and Character Education Assessment (Y) was distributed to 39 respondents, who then completed and returned it. The descriptive data for this variable are as follows: From the results of the Variable Y questionnaire, the mean value was 36.60, the median (Me) was 37, the mode (Mo) was 40, and the standard deviation (SD) was 4.2, rounded to 4. The maximum score obtained was 45, and the minimum score was 29, with a range of 20.

Table 2: Distribution of PA&I and Character Education Assessment Frequency

Class	Frequency
30-32	3
33-35	5
36-38	19
39-41	6
42-44	3
45-47	2
Total	39

Based on the frequency distribution table, the PAI and Character Education Assessment is categorised as medium, with 20 respondents (74%) in the medium category.

c. Effectiveness Data Analysis

The data analysis technique used in this research involved questionnaires completed directly by respondents. Based on the questionnaire results, the mean values for the effectiveness indicators were calculated as follows:

1. Effectiveness of Chromebook Learning Media Usage

The questionnaire for **the** effectiveness of Chromebook media consisted of three indicators, with the results as follows: Accessibility 84%, Interactivity: 85%, and Real-Time Feedback 84%.

Table 3 Questionnaire Results per Indicator

Variable	Indicator	Percentage	Category
Chromebook Learning Media	Accessibility	84%	Very Effective
	Interactivity	85%	Very Effective
	Real-Time Feedback	84%	Very Effective

The results above indicate that Chromebook Learning Media is highly effective in providing accessibility, interactivity, and real-time feedback. These factors contribute significantly to improving the learning experience for students.

2. PAI and Character Education Assessment

The questionnaire for the PAI and Character Education Assessment (Y) consisted of two indicators, with the results as follows: Ability to Analyse Data at 81.2% and Personalisation and Flexibility at 79.52%.

Table 4 Results for PAI and Character Education Assessment Indicators

Variable	Indicator	Percentage	Category
PAI and Character Education Assessment	Data Analysis Ability	81.2%	Effective
	Personalisation and Flexibility	79.52%	Effective

Based on the results, the PAI and Character Education Assessment also prove to be effective, with high percentages for data analysis ability, personalisation and flexibility.

Based on the research results regarding the effectiveness of using Chromebook media in the PAI (Islamic Education) and Character education assessment activities at SDN 90 Seluma, Bengkulu, the findings can be summarised as follows. In implementing the PAI and Character education assessments, using Chromebook media significantly improved the efficiency of feedback processes. With access to various educational platforms and applications, teachers could provide comments and advice more effectively. Moreover, the real-time collaboration feature allowed teachers and students to interact and discuss directly, speeding up the learning process. Additionally, the ability to access learning materials online enabled students to obtain supplementary information, which supported their understanding of the subject matter. The Chromebook's Chrome OS, being lightweight and fast, allowed quick boot times and smooth application performance, making file management through Google Drive more convenient across various devices. The Chromebook learning media greatly contributed to the ease and efficiency of the assessment process by storing and reviewing automatic responses in real time, reducing the need for manual corrections (Astuti, 2023).

The effectiveness of Chromebook media in the PAI and Character education assessments at SDN 90 Seluma was evident from the convenience of managing learning materials, devices, and assessments. The Chromebook helped save time in several ways, such as when students completed assessments, and teachers no longer needed to correct answers manually. This automatic grading feature significantly sped up the assessment process. Moreover, the cost-effectiveness of using Chromebook media was apparent, as it eliminated the need for printing photocopies or answer sheets, which would typically incur additional costs. The findings from this research align with Astuti's (2023) work, which highlighted the positive impact of Chromebook use on enhancing students' motivation to learn. The study suggested that integrating technology into learning environments not only boosts students'

engagement but also improves their overall learning experience by making learning tools more accessible and interactive (Khoiriyati, 2022).

Research conducted by Khoiriyati (2022) on the adoption of digital tools like Chromebooks found that they have a positive impact on student motivation, with the results showing a 13% increase in learning outcomes. This aligns with the findings of Supriadi (2021), who demonstrated that using Chromebooks in educational settings leads to higher student motivation, particularly when digital learning tools are integrated effectively. These studies suggest that Chromebooks not only function as a medium for delivering educational content but also play a significant role in improving the quality and efficiency of assessment processes. By facilitating real-time feedback, better accessibility, and faster interaction, Chromebook media has proven to be an effective and essential tool in modern education (Supriadi, 2021; Khoiriyati, 2022).

CONCLUSION

The research results using the Mix Method, which examines the use of Chromebooks as learning media in the assessment activities of PAI (Islamic Education) and Character education at SDN 90 Seluma, Bengkulu Province, indicate that this media is effective. This is supported by quantitative data showing the results of regression analysis on aspects of ease, clarity, and speed of access to assessments. The percentage of indicators for *Effectiveness of Chromebook Learning Media* is as follows: accessibility at 84%, interactivity at 85%, and real-time feedback at 84%. Meanwhile, in the assessment activities for PAI and Budi Pekerti, the ability to analyse data reached 81.2%, while personalisation and flexibility were at 79.52%. These findings are reinforced by qualitative data describing the implementation of Chromebook learning media as running smoothly, interacting effectively, and enhancing student motivation.

The effectiveness of using Chromebook learning media in PAI and Character education assessments at SDN 90 Seluma is influenced by several supporting factors, including the school principal's role in encouraging teachers and students to use Chromebook media. Although the availability of Chromebook media is limited, the implementation of assessments still runs effectively. This shows that the use of technology-based media can improve the quality and effectiveness of the assessment process in schools, even with limited resources.

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