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DEVELOPMENT OF "SELF-REFLECTION INSTRUMENT FOR CHARACTER DETECTION (SERINTERON)" TO HELP STUDENTS KNOW THE STRENGTHS AND WEAKNESSES OF THEIR CHARACTERS

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Abstract

The purpose of this study was to develop an independent technology-based reflection instrument to detect the strength of religious character, helping students identify their character strengths and weaknesses while also assisting teachers in selecting appropriate religious character-strengthening programs based on students' conditions. We used the Analysis, Design, Development, Implementation, dan Evaluation (ADDIE) model because it provides a structured approach to instructional design, ensuring systematic development and evaluation. The results indicated that the instrument had a good level of validity because expert evaluations confirmed its accuracy. Construct and content validity assessments demonstrated that the instrument met the required standards. After validation, a limited trial was conducted with students, showing high effectiveness. This instrument was also considered practical, as evidenced by student questionnaire responses. Additionally, interviews with teachers confirmed its ease of implementation in learning because the instrument was designed with user-friendly procedures. These findings were obtained because the instrument underwent systematic development, incorporated revisions based on expert feedback and was trailed to assess effectiveness and practicality. This research impacts students by enabling them to assess their religious character strengths while also providing teachers with valuable data to design learning programs that align with students' needs.

Keywords: Elementary school, Religious character, Self-reflection instrument, Serinteron, Students.

1. Introduction

Character education is a fundamental aspect of student development, fostering values that shape behavior and decision-making [1-5]. Among various character attributes, religious character plays a crucial role in guiding ethical and moral actions. This makes many reports regarding religious been well-developed [6-10]. However, assessing and strengthening students' religious character remains a challenge due to the lack of standardized measurement tools in educational settings. Without a structured evaluation method, students struggle to identify their strengths and weaknesses, while teachers face difficulties in designing effective character-strengthening programs.

Self-reflection has been widely recognized as an effective approach to character education [11-13]. Studies indicate that self-reflection tools assist in evaluating competence and reinforcing character development [14, 15]. Furthermore, research highlights their role in enabling teachers to adopt data-driven strategies to support student growth [16, 17]. Despite these benefits, many schools still lack systematic instruments to assess religious character, making it difficult to integrate structured self-reflection into learning processes.

To address this gap, additional technology can be used to support the current issue [18-22]. This study developed Self Reflection Instrument for Character Detection (SERINTERON); an Android-based application designed as an independent reflection tool for students. The application provides a structured platform for students to evaluate their religious character, understand their strengths and weaknesses, and take steps toward self-improvement. Additionally, it assists teachers in designing more targeted character education programs.

We used the Analysis, Design, Development, Implementation, dan Evaluation (ADDIE) development model, ensuring a systematic design and evaluation process. The novelty of SERINTERON lies in its (i) integration of self-reflection instruments that have proven effective in character formation, (ii) utilization of an Android-based platform for enhanced assessment efficiency, and (iii) inclusion of audio guides to support students with low literacy [23]. The findings of this research contribute to educational technology by demonstrating how self-reflection tools can facilitate character development and improve learning outcomes.

2. Literature Review

Figure 1 illustrates the relationship between self-reflection and character development through an Android application. The process begins with Self-Reflection, Self-Evaluation, and Self-Improvement, where users engage with questions or activities to reflect on their behavior. AI and NLP analyse responses, detect emotional patterns, and provide automated feedback, while Cloud Computing ensures secure data storage. In the Personal Value Identification and Strengths and Weaknesses Analysis stages, users recognize their values and assess their character. Machine Learning (ML) identifies behavioral patterns and offers recommendations, while Biometric Analysis (via camera or microphone) detects facial expressions and voice tone. The Character Development stage incorporates Gamification, Augmented Reality (AR), and Virtual Reality (VR) to enhance social skills through interactive exercises. Finally, the self-awareness and confidence stages foster self-understanding, boost confidence, and strengthen character [24-

28]. The integration of Android applications in education has been widely explored. Research highlights their ability to enhance learning motivation and engagement [29, 30]. Mobile technology can significantly improve student outcomes [31], but effective implementation requires pedagogically sound design [32, 33]. However, challenges such as infrastructure limitations and teacher readiness must also be addressed [34, 35].

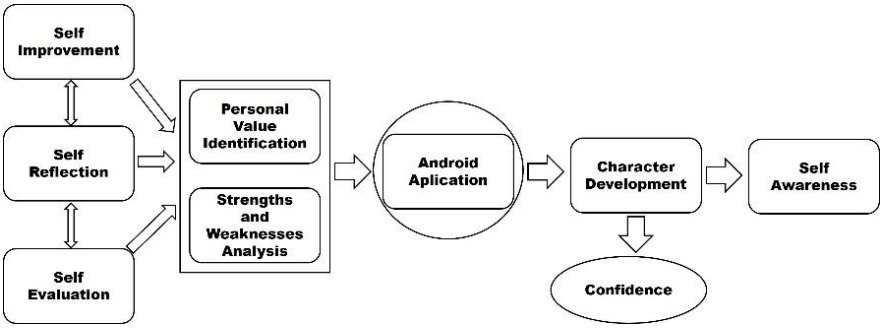

Fig. 1. The relationship between application technology and character education.

3. Method

The study followed five stages: Analysis, Design, Development, Implementation, and Evaluation. Validity was assessed by two expert teams, effectiveness was tested through a limited trial, and practicality was evaluated via student questionnaires and teacher interviews.

4. Results and Discussion

Figure 2 illustrates the application on an Android smartphone. Students download the APK via barcode scanning (No.1), install it (No.2), and access the app for self-reflection (No.3). Before testing, they can review instructions (No.4). The test consists of 50 true-false statements, with results categorized into weak (≤250), normal (251-399), and strong (≥400) character strength (No.5). Research supports mobile applications as effective tools for self-reflection in character education [36, 37]. Android-based self-reflection enhances awareness more effectively than traditional methods [38, 39]. While Serinteron uses true-false assessments, other studies suggest Likert scales for more detailed evaluations [40]. Integrating gamification could further improve engagement [14] Additionally, mobile apps have been used for intelligent diagnosis in education, emphasizing technology's role in character development [41]. Serinteron serves as both an educational tool and strategy for character education [3, 42].

Table 1 presents validation and trial results. Detailed information on how to calculate from statistical data is reported elsewhere [43-45]. Construct validity (language, technology, visual appearance) averaged 86, while content validity (material, evaluation, reflection) scored 75.3, placing Serinteron in the valid category (final score: 80.65). Trial results indicated high effectiveness (91.11), and practicality (77) based on student feedback. Teacher interviews confirmed its ease of implementation. These findings align with research showing that digital tools

enhance learning and classroom assessment effectiveness [46]. This study adds new information, especially when utilizing android for improving education as reported elsewhere [47, 48].

Fig. 2. Serinteron apk product on android smartphone: (1) apk download link (2) apk icon on smartphone (3) Serinteron initial display (4) instructions for use (5) test page (6) measurement results.

Table 1. Research results.

Aspect	Value	Score	Result
Construct Validity	86		
Validity of Content	75.3	80.65	Valid
Application Usage	80		
Implementation of Instruments	93.3	91.1	Very Effective
Test Results	100		
Practicality questionnaire		77	Practical

5. Conclusion

The results of the study showed that the Serinteron instrument had good validity based on expert assessment. Construct validity obtained an average score of 86, while content validity obtained an average score of 75.3. Overall, this instrument was declared valid with a final score of 80.65. The results of the trial showed that this instrument had high effectiveness with an average score of 91.11 and was declared practical with a score of 77 based on the student questionnaire. Interviews with teachers also supported that this instrument was easy to apply in learning.

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