

Development of a Digital Assessment Model for Evaluating Early Childhood Emotional Readiness for Elementary School Entry

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Abstract: This study aimed to develop a Digital Assessment Model for evaluating early childhood emotional readiness before primary school entry. The model was designed to assess five dimensions of emotional readiness, namely self-awareness, self-regulation, self-control, self-confidence, and self-esteem, while providing teachers with a systematic, efficient, and technology-supported assessment tool. This study employed a Research and Development (R&D) approach using the ADDIE model, which consists of Analysis, Design, Development, Implementation, and Evaluation stages. The developed model can be applied in early childhood education institutions, kindergarten settings, school readiness assessment programs, educational technology development, and child development monitoring. It can support teachers, school administrators, educational researchers, and policymakers in conducting systematic and efficient emotional readiness assessments before children transition to primary school. A practical technological solution that enhances assessment efficiency, improves documentation quality, and supports educational decision-making in early childhood education.

Keywords: *Digital Assessment Model, Emotional Readiness, Early Childhood Education, School Readiness, ADDIE Model*

A. Introduction

Early Childhood Education (ECE) plays a fundamental role in supporting children's holistic development and preparing them for successful participation in formal schooling. In Indonesia, ECE is recognized as an essential educational stage that provides developmental stimulation for children from birth to six years old, enabling their physical, cognitive, social, and emotional growth before entering primary education. Recent educational policies, including the Merdeka Curriculum and the Foundation Phase Learning Outcomes, emphasize the importance of developing children's self-identity, social-emotional competence, independence, and character as key foundations for lifelong learning.

Among the various dimensions of school readiness, emotional readiness has emerged as a critical factor influencing children's successful transition from kindergarten to primary school. Emotional readiness refers to children's ability to recognize emotions, regulate emotional responses, control behavior, develop self-confidence, and maintain positive self-esteem when encountering new learning environments and social situations. Studies have consistently demonstrated that children with stronger emotional competencies

adapt more effectively to school routines, establish positive peer relationships, and achieve better academic outcomes than children who experience difficulties in emotional regulation and social adjustment (Sheean et al., 2014; Kalinde et al., 2024).

Despite its importance, school readiness assessments in many educational settings remain predominantly focused on academic competencies such as literacy and numeracy (Hachem et al., 2022). Consequently, children who appear academically prepared may still encounter substantial challenges during school transition due to inadequate emotional maturity. Previous studies have also reported that many ECE institutions lack comprehensive assessment instruments capable of systematically evaluating children's emotional readiness before primary school entry (Garon-Carrier et al., 2024).

Another challenge concerns the limited integration of digital technology in early childhood assessment practices. Assessment activities are frequently conducted manually, resulting in lengthy administration procedures, fragmented documentation, and increased potential for recording errors (Mahyuddin et al., 2025). Such limitations reduce teachers' ability to monitor children's emotional development continuously and to provide timely interventions when emotional difficulties are identified. Although educational technology has been increasingly adopted in learning environments, the development of digital assessment systems specifically designed to evaluate emotional readiness in early childhood remains limited.

Several previous studies have investigated social-emotional development, school readiness, and digital assessment separately. However, research integrating these three domains into a validated and practical digital assessment model for evaluating emotional readiness prior to primary school entry is still scarce. Furthermore, existing instruments generally focus on broad developmental outcomes and often lack automated scoring, structured reporting features, and teacher-friendly interfaces that support assessment implementation in everyday classroom settings.

To address these gaps, this study develops a Digital Assessment Model for Evaluating Early Childhood Emotional Readiness for Primary School Entry. The model is designed to assess five key dimensions of emotional readiness, namely self-awareness, self-regulation, self-control, self-confidence, and self-esteem. The digital platform enables teachers to conduct assessments more systematically, efficiently, and accurately through integrated data collection, automated scoring, and structured reporting features.

The novelty of this study lies in the development of a digital assessment model for evaluating early childhood emotional readiness prior to primary school entry. Unlike conventional assessment practices that rely on paper-based instruments and manual data processing, the proposed model integrates observation-based assessment, automated scoring, and structured digital reporting within a single platform. This integration enables teachers to assess children's emotional readiness more systematically, efficiently, and accurately. By facilitating data collection, score calculation, and interpretation of assessment results, the model is expected to support early identification of children's emotional readiness and provide a practical tool for planning appropriate educational interventions before the transition to primary school.

B. Methods

Research Design

This study employed a Research and Development (R&D) approach using the ADDIE model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation (Branch, 2009). The model was selected because it provides a systematic framework for developing educational products that are valid, practical, and effective. The product developed was a Digital Assessment Model designed to evaluate early childhood emotional readiness for primary school entry based on five dimensions: self-awareness, self-regulation, self-control, self-confidence, and self-esteem.

The study was conducted at RA Ruwas Indah, Padang City, Indonesia. Participants included one media expert and one assessment expert for product validation, seven kindergarten teachers for practicality testing, and 25 children aged 5–6 years for field testing. Participants were selected using purposive sampling (Lenaini, 2021; Sugiyono, 2021).

The Analysis phase identified the need for a systematic and technology-supported assessment model through literature reviews, observations, interviews, and document analysis. The Design phase involved developing assessment indicators, observation checklists, rating scales, scoring rubrics, assessment reports, and application specifications. During the Development phase, the assessment framework was transformed into a digital application featuring assessment forms, automated scoring, data storage, and report generation. The product was then validated by experts and revised based on their feedback.

The Implementation phase involved testing the revised application in a real educational setting. Teachers were trained to use the application and subsequently employed it to assess children's emotional readiness. Practicality data were collected through questionnaires, observations, and interviews. Finally, the Evaluation phase was conducted continuously throughout the development process. Product quality was assessed in terms of validity, practicality, and effectiveness, and the evaluation results were used to refine the final version of the digital assessment model before broader implementation.

Instruments and Data Collection

Data collection was conducted using multiple techniques to ensure the comprehensiveness, credibility, and triangulation of research findings. The instruments employed in this study included semi-structured interview guides, observation sheets, documentation records, and questionnaires. These instruments were designed to obtain both qualitative and quantitative data related to the development, validation, practicality, and effectiveness of the Digital Assessment Model for Evaluating Early Childhood Emotional Readiness for Primary School Entry.

Following implementation, additional interviews were conducted to explore teachers' experiences using the digital assessment application, perceived benefits, usability issues, technical challenges, and suggestions for future improvements. The interview process

enabled researchers to gain a deeper understanding of user needs and product acceptance within authentic educational settings. Table 1 presents the major themes explored during the interview process.

Table 1. Interview Indicators

Dimension	Indicators
Existing Assessment Practices	Current assessment procedures, assessment instruments used, documentation systems
Emotional Readiness Assessment	Teachers' understanding of emotional readiness indicators
Assessment Challenges	Difficulties in conducting emotional readiness assessment
Technology Integration	Experience using digital assessment tools
Product Evaluation	User satisfaction, strengths, weaknesses, and recommendations

Observations

Observation was employed to obtain direct evidence regarding children's emotional behaviors and teachers' implementation of the digital assessment model. The researcher conducted non-participant observations during classroom learning activities. Observational data focused on two primary aspects:

1. Children's emotional readiness behaviors, including emotional recognition, emotional regulation, self-control, confidence, and self-esteem.
2. Teachers' interaction with the digital assessment application, including ease of use, navigation, scoring procedures, and report generation.

Observation data were recorded using structured observation sheets developed from emotional readiness indicators identified in the literature.

Table 2. Observation Indicators of Emotional Readiness

Dimension	Observable Behavior Indicators
Self-Awareness	Recognizes and expresses feelings appropriately
Self-Regulation	Manages emotions when facing challenges
Self-Control	Controls impulsive behaviors during activities
Self-Confidence	Participates confidently in classroom activities
Self-Esteem	Demonstrates positive self-perception and pride in achievements

Documentation

Documentation was used to complement and validate data obtained from interviews and observations through data triangulation (Amane, 2020). The collected documents included assessment instruments, children's developmental reports, observation records, field notes, photographs of learning activities, screenshots of the digital assessment application, expert validation forms, practicality and effectiveness questionnaires, and assessment reports generated by the application. These documents served as supporting evidence throughout the development and evaluation process, ensuring the credibility and accuracy of the research findings.

Questionnaires

Questionnaires were used to collect quantitative data regarding the validity, practicality, and effectiveness of the developed product. All items employed a five-point Likert scale ranging from 1 (Strongly Disagree) to 5 (Strongly Agree) (Riduwan, 2009). The questionnaires were administered to experts, teachers, and users involved in the implementation process to evaluate whether the digital assessment model met the expected quality standards and user needs.

Expert Validation Questionnaire

The expert validation questionnaire was administered to educational assessment and educational technology experts before field implementation. The instrument evaluated four aspects: content validity, language and readability, interface design, and technical quality. The validation results were used to revise and improve the digital assessment model before implementation.

Table 3. Expert Validation Questionnaire Indicators

Aspect	Indicators
Content Validity	Relevance of indicators, suitability with emotional readiness constructs
Language	Clarity, readability, grammar accuracy
Interface Design	Layout, navigation, visual appearance
Technical Quality	Functionality, responsiveness, system stability

Practicality Questionnaire

The practicality questionnaire was administered to teachers after the implementation of the product. The purpose of this questionnaire was to evaluate teachers' perceptions regarding the usability and applicability of the product in classroom settings. Several aspects were assessed, including the ease of use of the product, its user-friendliness, time efficiency during implementation, clarity of the instructions provided, and its suitability for conducting classroom assessments. The results of the questionnaire were used to determine the practicality level of the product and its potential effectiveness in supporting teaching and assessment activities.

Table 4. Practicality Questionnaire Indicators

Aspect	Indicators
Ease of Use	Ease of navigation and operation
Usefulness	Contribution to assessment activities
Efficiency	Time-saving features
Interface Quality	Visual clarity and attractiveness
Compatibility	Suitability with classroom assessment needs

Effectiveness Questionnaire

The effectiveness questionnaire was designed to evaluate whether the digital assessment model successfully facilitated the assessment of children's emotional readiness. The effectiveness assessment focused on five dimensions of emotional readiness.

Table 5. Emotional Readiness Dimensions and Indicators

Dimension	Sample Indicators
Self-Awareness	Identifies and communicates emotions appropriately
Self-Regulation	Controls emotional responses during activities
Self-Control	Demonstrates behavioral control in social situations
Self-Confidence	Expresses opinions confidently
Self-Esteem	Shows positive attitudes toward self and achievements

Data Analysis

Both quantitative and qualitative approaches were employed to analyze the collected data.

Validity Analysis

Product validity was determined through expert judgment. The percentage of validity was calculated using the following formula:

$$P, = \frac{\sum X}{\sum Xi} \times 100\%$$

P = validity percentage

$\sum X$ = total score obtained

$\sum Xi$ = maximum possible score

Table 7. Validity Criteria

Percentage Interpretation	
81-100%	Very Valid
61-80%	Valid
41-60%	Moderately Valid
21-40%	Less Valid
0-20%	Invalid

C. Results and Discussion

Analysis Stage

The analysis stage was conducted to identify the needs and challenges related to the assessment of emotional readiness among early childhood children before entering primary school at RA Ruwas Indah, Padang City. Data were collected through literature reviews, classroom observations, interviews with teachers and the school principal, and analysis of assessment documents currently used in the institution. The purpose of this stage was to obtain a comprehensive understanding of existing assessment practices and determine the specifications required for the development of a Digital Assessment Model of Emotional Readiness.

The development of the **Digital Assessment Model for Evaluating Early Childhood Emotional Readiness for Primary School Entry** followed the ADDIE development framework comprising Analysis, Design, Development, Implementation, and Evaluation. Each stage generated empirical evidence supporting the feasibility of the developed model. During the **analysis phase**, classroom observations, interviews, and document analysis revealed that emotional readiness assessment at RA Ruwas Indah remained

predominantly manual, relying on anecdotal records and teacher observations without standardized digital support.

Teachers experienced considerable challenges in maintaining assessment consistency, documenting developmental progress, and producing systematic reports. These findings indicate that existing assessment practices were inefficient and lacked objectivity, confirming the need for an integrated digital assessment model. The **design phase** translated these needs into a digital assessment framework incorporating five dimensions of emotional readiness: self-awareness, self-regulation, self-control, self-confidence, and self-esteem. The application architecture included observation instruments, automated scoring, digital reporting, and an electronic guidebook to improve usability and facilitate implementation.

During the **development phase**, the prototype was validated by experts in educational assessment and instructional media. The validation process resulted in an overall feasibility score of **88.67%**, categorized as **Very Valid**, indicating that the application met acceptable standards regarding content relevance, language clarity, functionality, and interface quality. Expert recommendations concerning wording clarity and interface consistency were incorporated before field implementation.

The **implementation phase** demonstrated satisfactory practicality, with teachers reporting that the application simplified assessment activities, reduced administrative workload, and improved documentation efficiency. Practicality testing achieved **70.54%**, classified as **Practical**. Product trials also showed measurable improvements in assessment outcomes, increasing from **73.61%** during pretest assessment to **81.11%** during posttest assessment. Broader effectiveness testing further indicated improvement from **75.16%** to **83.16%**, representing an overall increase of **8.00%**.

The results of the initial observations revealed that emotional readiness assessment was still conducted conventionally through direct observation during daily learning activities. Teachers recorded children's emotional behaviors manually using observation sheets, anecdotal notes, and simple checklists. Although these assessment practices provided useful information regarding children's development, the process lacked systematic procedures and comprehensive indicators for measuring emotional readiness. Assessment activities were generally conducted based on teachers' subjective observations without the support of standardized instruments or digital technologies.

Several challenges were identified during the needs analysis process. Teachers reported difficulties in conducting emotional readiness assessments consistently and objectively across different children and situations. Manual recording procedures required considerable time and effort, particularly during data collection, documentation, and result compilation. Furthermore, assessment records were often stored in paper-based formats, making it difficult to retrieve, analyze, and monitor children's developmental progress over time. Another major issue was the absence of a practical digital assessment tool capable of evaluating all dimensions of emotional readiness comprehensively.

The interview findings also indicated that teachers needed an assessment application that was easy to use, practical, and capable of simplifying the assessment process. Teachers expected a digital system that could facilitate data entry, automate scoring procedures,

store assessment records securely, generate assessment reports automatically, and support continuous monitoring of children's emotional development. In addition, teachers emphasized the importance of having a user-friendly interface that could be operated without extensive technical training.

Design Stage

The design stage focused on translating the findings obtained during the analysis phase into a comprehensive blueprint for the Digital Assessment Model of Emotional Readiness. At this stage, assessment dimensions, behavioral indicators, assessment formats, application structures, and user interface components were systematically designed to ensure alignment with the identified needs of teachers and educational institutions.

The developed product was designed as a digital assessment application accessible through computers and smartphones. The application was intended to assist teachers in evaluating children's emotional readiness before entering primary school while simultaneously facilitating data management and assessment reporting. The design process emphasized simplicity, practicality, and usability to ensure that teachers could operate the application efficiently within daily classroom activities.

Five dimensions of emotional readiness were incorporated into the assessment framework: self-awareness, self-regulation, self-control, self-confidence, and self-esteem. Each dimension was operationalized into observable behavioral indicators that could be assessed through teacher observations during classroom interactions. These indicators served as the foundation for constructing assessment instruments and scoring procedures.

Several assessment components were designed within the application, including observation checklists, rating scales, automated scoring systems, and digital assessment reports. The assessment process was designed to be conducted over a period of one to two weeks through natural observations of children's behavior during classroom learning activities. This approach enabled teachers to obtain authentic information regarding children's emotional development while minimizing assessment pressure on the children.

Overall, the design stage produced a detailed blueprint that served as the foundation for developing a digital assessment system capable of supporting teachers in conducting efficient and comprehensive emotional readiness assessments.

Development Stage

The development stage involved transforming the conceptual design into a functional Digital Assessment Model of Emotional Readiness. The application was developed using Canva, Google Sheets, and Smart Creator to create an integrated digital assessment platform. Assessment indicators, scoring systems, reporting mechanisms, and user interfaces were incorporated into the application according to the design specifications established in the previous stage.

The assessment instrument was developed based on five dimensions of emotional readiness. Each dimension consisted of three observable behavioral indicators, resulting in a comprehensive framework for evaluating children's emotional development. The assessment system was integrated into Google Sheets to enable automatic score calculation and real-time data processing. This feature eliminated the need for manual scoring and significantly reduced teachers' workload during assessment implementation.

Following product development, expert validation was conducted to evaluate the quality and feasibility of the application. Validation involved media experts and assessment experts who reviewed content relevance, language clarity, interface design, functionality, and overall usability. The validation results indicated a total score of 133, with an average score of 8.87 and a validity percentage of 88.67%.

Table 10. Validation Results

Validation Aspect	Result
Total Score	133
Average Score	8.87
Validity Percentage	88.67%
Category	Very Valid

The high validity score demonstrates that the developed application meets the criteria for educational assessment products. Experts indicated that the content was relevant to early childhood emotional readiness assessment, the language was understandable, and the application design was visually attractive and easy to navigate.

Implementation Stage

The implementation stage aimed to examine the practicality and effectiveness of the developed Digital Assessment Model in real educational contexts. The implementation was conducted at RA Ruwas Indah, Padang City, from May 20 to June 2, 2026. During this phase, teachers used the application to assess children's emotional readiness while researchers observed the implementation process and collected user feedback.

Practicality Testing

Practicality testing involved teachers participating in Focus Group Discussion (FGD) activities after using the application. The results indicated a total score of 194 with a practicality percentage of 70.54%, which falls within the practical category.

Table 11. Practicality Testing

Component	Result
Total Score	194
Average Score	17.63
Percentage	70.54%
Category	Practical

The findings suggest that teachers perceived the application as useful, easy to operate, and supportive of classroom assessment activities. Teachers reported that the application simplified observation recording, reduced administrative workload, and improved assessment efficiency. Furthermore, the automatic scoring and reporting features were considered particularly beneficial for monitoring children's emotional development.

Product Trial

The product trial was conducted with Group B2 children. Results demonstrated an increase in emotional readiness assessment outcomes following application use. The pretest percentage score of 73.61% increased to 81.11% during the posttest assessment.

Table 12. Pretest and Posttest Results

Assessment	Percentage
Pretest	73.61%
Posttest	81.11%
Improvement	7.50%

This improvement indicates that the application effectively supported teachers in conducting more systematic and comprehensive emotional readiness assessments.

Evaluation Stage

The evaluation stage was conducted throughout the entire development process using both formative and summative evaluation approaches. Formative evaluation occurred during the analysis, design, and development phases through needs assessments, expert reviews, and product revisions. Summative evaluation was conducted after implementation to assess the overall quality of the developed application.

Evaluation findings demonstrated that the Digital Assessment Model successfully addressed the problems identified during the analysis stage. The application provided teachers with a structured assessment framework, automated scoring procedures, systematic data storage, and accessible reporting functions. Validation results categorized the product as very valid, while practicality testing indicated that the application was practical for classroom use. Furthermore, effectiveness testing demonstrated consistent improvements in assessment outcomes after implementation.

The overall evaluation results indicate that the Digital Assessment Model of Emotional Readiness for Early Childhood School Entry is valid, practical, and effective. The application supports teachers in conducting emotional readiness assessments more systematically, objectively, and efficiently while facilitating communication between schools and parents regarding children's emotional development. Therefore, the developed product is suitable for wider implementation in early childhood education settings.

Discussion

This study aimed to develop a Digital Assessment Model for Evaluating the Emotional Readiness of Early Childhood Children Entering Elementary School using the ADDIE model, which consists of the Analysis, Design, Development, Implementation, and Evaluation stages (Branch, 2009). The findings indicated that the developed model met the criteria of validity, practicality, and effectiveness for assessing children's emotional readiness.

These findings are consistent with Branch (2009), who emphasized that educational products developed through the ADDIE framework achieve higher implementation quality because each development phase is systematically evaluated. Similarly, recent studies by Garon-Carrier et al. (2024) and Kalinde et al. (2024) highlight that school readiness assessment should extend beyond cognitive domains to include social-emotional competencies that influence successful transitions into formal schooling.

Despite these promising findings, several limitations should be acknowledged. The implementation involved only one early childhood institution, limiting the generalizability of the findings across different educational contexts. Moreover, effectiveness evaluation focused primarily on teachers' perceptions and assessment outcomes without examining long-term impacts on children's school adjustment. Future research should therefore employ larger samples, multiple educational settings, and longitudinal designs to examine the sustainability of digital assessment implementation and its influence on children's academic and socio-emotional development.

The development stage resulted in a digital assessment application equipped with assessment instruments, an automated scoring system, and assessment reporting features. Expert validation yielded a score of 88.67%, categorized as highly valid. This result indicates that the product met the required standards in terms of content, language, and interface design. These findings are in line with Ahmad, et.al (2026), who found that digital assessment applications can improve the quality of child development data management and facilitate teachers in conducting educational evaluations.

At the implementation stage, the practicality test showed a score of 70.54%, indicating that the application was practical to use. Teachers reported that the application was easy to operate and helped make the assessment process more systematic. Furthermore, the effectiveness test revealed an increase in children's emotional readiness scores from 75.16% in the pre-test to 83.16% in the post-test. This improvement demonstrates that the digital assessment model not only assists teachers in conducting assessments but also provides more accurate information regarding children's emotional development. These findings support the study by Sakinah et al. (2026), which concluded that the use of digital technology in assessment enhances the effectiveness of educational decision-making through automated data storage and processing.

D. Conclusions

This study successfully developed a Digital Assessment Model for Evaluating Early Childhood Emotional Readiness for Primary School Entry using the ADDIE development model. The developed model integrates five dimensions of emotional readiness, namely self-awareness, self-regulation, self-control, self-confidence, and self-esteem, into a digital

assessment platform equipped with automated scoring and reporting features. The results demonstrated that the product achieved a validity score of 88.67% (very valid), a practicality score of 70.54% (practical), and showed positive effectiveness through improvements in children's emotional readiness assessment outcomes from pretest to posttest. The model effectively supports teachers in conducting emotional readiness assessments in a more systematic, objective, efficient, and well-documented manner compared to conventional manual procedures. Therefore, the Digital Assessment Model can serve as an innovative and practical tool for assessing early childhood emotional readiness before primary school entry, while also facilitating data management, monitoring children's emotional development, and supporting educational decision-making in early childhood education settings.

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