

Development of Mobile Application-Based Early Childhood Education and Elementary School Transition Guidelines for Parents

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ABSTRACT

This study addresses the critical transition from Early Childhood Education (PAUD) to Elementary School (SD), focusing on the development of a mobile application to support parents during this phase. The transition significantly impacts children's social, emotional, and cognitive readiness. Conducted in Babakan Ciparay, Bandung, the study employs the Research and Development (R&D) method using the ADDIE (Analysis, Design, Development, Implementation, Evaluation) framework. The sample consists of 150 parents of children in group B kindergarten/RA/equivalent and grades 1-2 SD/MI/equivalent, representing the transition phase. In-depth interviews were conducted with six parents to gather qualitative insights. Over 50% of parents demonstrated awareness of the PAUD-SD transition, but their understanding highlighted a need for accessible digital guidance, often sourced from the internet. These insights informed the creation of the PAUD.int application. Evaluation using the Technology Acceptance Model (TAM) and System Usability Scale (SUS) indicated high usability and acceptance of the app, confirming its effectiveness in supporting parents during this transition. The PAUD.int application has the potential to improve children's readiness and enhance parental engagement during the transition. However, challenges such as device compatibility and registration processes suggest opportunities for technical and functional enhancements. The development of the PAUD.int application demonstrates the value of digital tools in facilitating smoother PAUD-SD transitions. Future studies should explore further technical improvements and interactive features to expand its impact on parental support and child readiness.

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1. INTRODUCTION

In Indonesia, the transition from Early Childhood Education (PAUD) to Elementary School (SD) has gained significant attention from educators, policymakers, and parents. The Ministry of Education and Culture, in its 24th episode released on March 24, 2023, emphasized this transition as a critical phase that helps children adapt to a new environment. The initiative underscores the need for strategies

to ensure children's readiness and adaptability as they move from a play-based, flexible setting to a structured, academically demanding environment. Despite these efforts, a notable gap persists in resources available to parents, who play an essential role in supporting their children through this transition. Research highlights the importance of equipping children with foundational life skills before entering elementary school to ease this process (Hálfdanardóttir et al., 2021). Additionally, studies emphasize the role of early childhood teachers in facilitating successful transitions. While teachers often receive targeted training, parents frequently lack access to practical tools and resources needed to guide their children during this crucial period. To address this gap, this study focuses on the development of digital guidelines in the form of a mobile application, as proposed by Steed et al. (2022), to empower parents in preparing their children for the challenges of this developmental milestone.

The transition period has been recognized as a challenging time that can cause anxiety in some parents and children, thus emphasizing the need for support for parents during this phase (Liu et al., 2022). Parental involvement and home-school relationships are important predictors of children's learning outcomes during the early years of education (Lau & Lee, 2020). Families, especially parents, have a greater influence on the success of the PAUD-SD transition process felt by a child. It is hoped that the provision of assistance and parental treatment to children is not only based on habits, but parents need to have knowledge about providing assistance for children in facing the transition period (Kirby et al., 2020). Harmonious perception and knowledge of parents and teachers is important to create a strong bridge between families and schools in building a positive transition experience for children entering elementary school (Tobin et al., 2022). Providing adult treatment to children during the transition period of early childhood education and elementary school is recognized as supporting children, especially those at risk of poor transition, and preventing them from detaching themselves from academic life and supporting their mental health (Donaldson et al., 2023). While these findings highlight the importance of adult intervention, there is limited exploration of practical tools for parents to bridge this gap. By addressing this need, the present study seeks to contribute to the literature by offering a digital solution that equips parents with the knowledge and resources needed to support their children during the PAUD-SD transition, thus filling a critical gap in existing research and practice.

A quality transition process is a transition that involves cooperation between families, schools and communities. The family in question includes parents, guardians, and caregivers who interact directly with the child. The opinions, needs, and choices expressed by families need to be appreciated and integrated into the transition process of PAUD-SD (Dunlop, 2021). The need for involvement from various parties in the transition process gives an idea that the "smooth" transition process of PAUD-SD has an important influence on children's lives (Schürer et al., 2022). With the understanding possessed by parents, teachers and the community in providing treatment to children in the transition age can reduce the anxiety phenomenon that children may feel.

The Ministry of Education, Culture, Research, and Technology in 2023 issued the Booklet on Strengthening the Early Childhood Transition, which defines the transition from early childhood education to elementary school as the process of aligning learning between the two levels to minimize students' adjustment challenges. As part of this initiative, the Ministry released six guideline modules and a dedicated website targeting teachers, education offices, and partners. However, these resources primarily focus on educators, leaving a critical gap in guidance materials specifically designed for parents. This lack of resources for parents underscores the need for more inclusive support to ensure all stakeholders, especially families, are equipped to assist children during this crucial transition period.

Given the importance of the role of parents in this transition process, this study is designed to provide assistance and facilitate access to information for parents on how to accompany their children during the transition period from early childhood to elementary school. Initial surveys show that 40% of parents have never received information or participated in counseling activities about the transition of early childhood education and elementary school organized by schools. Although information about mentoring during the transition period is widely available online, both on websites and on social media,

many parents express difficulty in finding reliable and easy-to-understand sources. This is often exacerbated by the presentation format on some ad-filled news sites, requiring extra patience from parents to sift through and understand relevant information. This indicates an urgent need for more structured and accessible resources that can effectively guide parents through this critical period.

In Indonesia, no research has succeeded in developing digital guidelines based on mobile applications aimed at helping parents accompany their children during the transition period from Early Childhood Education (PAUD) to Primary School (SD). Previous research on the transition of PAUD-SD generally focused on teachers and students as the main subjects (Ariyanto et al., 2023; Hasanah et al., 2023; Hasmalena et al., 2023; Maulani & Mutiara, 2023; Musanna, 2012; Reza & Asbari, 2024; Wijaya, 2023). In contrast, studies that explore the role of parents during this transition are still limited to activities such as mentoring (Lestari, 2023), focus group discussions (Sri Rika Amriani.H et al., 2023), or analysis of parents' perspectives regarding the transition (Yuli Supriani, 2023). Meanwhile, the research of Intang Sappaile et al (2023) investigated the potential of mobile applications in increasing parental participation, their study was limited to a literature review without advancing practical digital solutions. This gap highlights a critical oversight: the lack of tools to empower parents with practical, accessible guidance to actively support their children's transition. By developing digital guidelines tailored to parents, this study seeks to address this unmet need, providing a novel approach that complements existing efforts targeting educators and students.

Research on the development of easily accessible digital guidelines through mobile applications to support parents during the transition from Early Childhood Education (PAUD) to Primary School (SD) remains scarce. This transition is a critical phase where effective parental support is essential to ensure children's smooth adaptation to a more structured academic environment. To address this gap, the study in the development of digital guidelines for early childhood and elementary school transition based on mobile application for parents was conducted. Its primary goal is to design interactive, user-friendly digital guidelines that enhance parental involvement in their children's education. Utilizing the systematic ADDIE framework (Analysis, Design, Development, Implementation, and Evaluation), this research contributes to expanding theoretical insights into the role of parents during the PAUD-SD transition and its impact on children's readiness and academic outcomes. It also provides practical tools to empower parents with actionable resources for effective support during this crucial phase. Furthermore, the study demonstrates the methodological value of the ADDIE framework in developing technology-based educational solutions tailored for parents. By addressing these objectives, the research seeks to enrich theoretical understanding, offer practical solutions, and support families navigating this important educational transition.

2. METHODS

This study uses the Research and Development (R&D) method with the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) approach (Branch, 2009). This approach was chosen because it is suitable for a project that aims to develop a new product in the form of a digital guideline based on a mobile application to accompany parents during their children's transition from early childhood to elementary school. This method allows researchers to systematically analyze needs, design and develop products, implement them, and then evaluate their effectiveness.

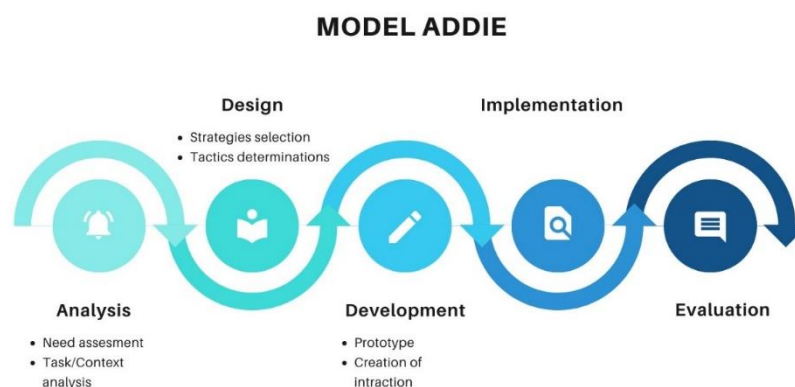


Figure 1. ADDIE Research Procedure (Branch, 2009)

The ADDIE model is a systematic instructional design framework consisting of five interconnected phases: Analysis, Design, Development, Implementation, and Evaluation. The Analysis phase focuses on identifying needs, assessing tasks, and analyzing the context to establish goals. In the Design phase, strategies are selected, and tactics are determined to create a structured plan. The Development phase involves creating prototypes and interactive content based on the design plan. The Implementation phase ensures the developed solutions are deployed effectively, often involving testing and training. Finally, the Evaluation phase assesses the effectiveness of the entire process and identifies areas for improvement. The model emphasizes iterative feedback loops, ensuring continuous refinement throughout the phases.

In a study conducted to develop mobile app-based PAUD-SD transition guidelines for parents, four main types of data were collected using various techniques:

- 1) **Needs Analysis Data:** This data was gathered through interviews and questionnaires to understand the actual needs of parents during the transition from early childhood to elementary school. The sample consisted of 150 parents, selected through purposive sampling to include those with children in kindergarten (group B) and grades 1–2 of elementary school. Qualitative data was derived from open-ended interview responses, while quantitative data came from structured questionnaires. This combination of data provides comprehensive insights into parents' challenges and expectations during the transition.
- 2) **Transition Guidelines Development Blueprint Data:** This data focuses on the design of the mobile application, including its user interface (UI), user experience (UX), and desired features. The development process involved collaboration with UI/UX experts, educators, and parents to ensure the design aligns with user needs and pedagogical objectives. Evaluation criteria included usability, accessibility, and aesthetic appeal, informed by expert input and the findings from the needs analysis.
- 3) **Implementation Data on the Use of Transition Guidelines:** Observational data was collected to assess how parents interact with the application in real-world settings, such as at home or during school-related activities. Observations spanned a two-week period, allowing researchers to record user behavior, spontaneous feedback, and any difficulties encountered. This qualitative data provided in-depth insights into the practical application of the app.
- 4) **Technology Acceptance Evaluation Data:** This data was collected using a validated Technology Acceptance Model (TAM)-based questionnaire, which assessed perceived usefulness, ease of use, and intention to use the app. The questionnaire was pilot-tested with a smaller group of parents to ensure its validity and reliability before full

deployment. The resulting quantitative data was critical for evaluating the app's effectiveness in meeting user needs and its potential for widespread adoption.

Through this structured approach, the research aims to develop an application that not only meets the information needs of parents but is also easy to use and accept in the user community. In the research on the development of mobile application-based digital guidelines for parents, data collection techniques are divided into two types: qualitative and quantitative. Qualitative data is obtained through needs analysis, product development, and expert validation using interview and observation guidelines, providing in-depth insights into user experiences and reactions. Quantitative data is collected through a needs analysis survey and user acceptance evaluation, which is analyzed using descriptive and inferential statistics with the SPSS 25.0 application. Descriptive statistics, such as mean, standard deviation, and percentage distribution, are used to summarize the data, while inferential analysis, including correlation and regression, is employed to identify relationships between variables such as perceived usefulness, ease of use, and user intention. For evaluation, the Technology Acceptance Model (TAM) and System Usability Scale (SUS) are employed. TAM assesses perceived usefulness and ease of use, providing a theoretical foundation for understanding user acceptance. SUS, consisting of ten questions rated on a Likert scale from "strongly agree" to "strongly disagree," is used to measure the usability of the application. This scale is particularly effective for small sample sizes, offering a straightforward yet reliable method for evaluating usability. The SUS evaluation focuses on parents in Bandung involved in the development process, ensuring practical feedback and actionable insights to refine the application..

3. FINDINGS AND DISCUSSION

3.1 Factual Conditions of Parental Understanding Related to Early Childhood Education-Elementary School Transition

Data on parental understanding of the PAUD-SD transition was gathered through a questionnaire involving 150 respondents and interviews with 6 respondents. The questionnaire respondents consisted of parents with children in group B kindergarten/RA/equivalent (35.8%), grade 1 SD/MI/equivalent (33.8%), and grade 2 SD/MI/equivalent (30.5%). For the interviews, the participants included two parents from each category: group B kindergarten/RA/equivalent, grade 1 SD/MI/equivalent, and grade 2 SD/MI/equivalent.

Factual data shows that more than 50% of parents know about the term PAUD-SD transition. Based on the results of the interviews, parents have a diverse understanding of the transition period from PAUD-SD. MS, AR, and CM are respondents who have similar opinions regarding the transition period from PAUD to SD, which is the period of level transfer experienced by children from PAUD to SD which requires children to be able to adapt to a new environment. The results of the interview are in line with the bio-ecological theory put forward by Bronfenbrenner (1986) stating that the transition to school is the first and main form of bio-ecological transition in a child's life (Nurhayati, 2018). Therefore, children not only change levels of education but are also required to adapt to their new environment. The new environment includes the physical environment and the social environment of children. Ecological theory sees the transition period as a process of interconnection and mutual influence between the social world of children and the adults around them.

Respondents argued that the transition period is a period that children will instinctively be able to face without the need for special assistance from parents. This was revealed in an interview with the following quote "... the transition from PAUD to elementary school will automatically mean that the children are ready to enter elementary school...". This opinion is contrary to the opinion put forward by Chen (2024); Garrity et al. (2021); and Lloyd et al. (2022) who have the view that a quality transition process is a transition that involves cooperation between families, schools, and communities. So that children cannot be left alone in facing the transition period. There needs to be a stimulus provided by the surrounding adults that can encourage children to be better prepared to face the transition from PAUD-

SD. With the understanding that parents, teachers, and the community have in providing support to children during this transition period, the anxiety that children may feel can be reduced (Kowalski et al., 2021).

3.2 Analysis of the Needs for the Development of Digital Guidelines for Early Childhood and Elementary School Transition Based on Mobile Applications for Parents

The needs analysis was carried out in April 2024 through surveys and interviews. The respondents in the survey amounted to 150 with the distribution of parents in group B as much as 36%, parents in grade 1 of elementary school as many as 34% and parents in grade 2 of elementary school 30%. Meanwhile, the respondents to the needs analysis interview amounted to 6 parents with details of 2 parents of group B, 2 parents of grade 1 of elementary school, 2 parents of grade 2 of elementary school. The results of surveys and interviews show that parents obtain information related to the transition of PAUD-SD from various sources. One of the main sources for parents to know the term PAUD-SD transition is through the internet. As stated by CM "information about the transition of PAUD SD is usually just searched on the internet, especially now that internet technology has advanced, so just search for it on the internet on Google".

CM respondents made the internet the main medium in seeking information about the transition from PAUD-SD. CM is a mother who has a career so she cannot participate in parenting activities held at school. The same thing was also stated by TS, AR, and MT, the internet is the main source of information search. Furthermore, AR said that he used to look for information related to children's development through youtube and tiktok channels by looking at short videos.

Survey data shows that 40.4% of parents seek information through websites, 31.8% through Instagram, 15.9% TikTok, 11.3% Facebook and 43% through other sources. Based on the results of interviews with parents, the internet is used as a means of finding information, namely the ease of finding information, can be done anywhere, and the cost efficiency incurred by parents. As stated by MT "just Googling, yes, it makes it very easy to see and also what information we need or what we want is available completely". In addition, according to IYA, the use of the internet in finding information about the transition from PAUD-SD is considered more effective, easy and helpful in increasing parents' knowledge. The content or information needed by parents on the platform includes topics related to the basic concept of the early childhood-elementary school transition, child psychology, children's social-emotional and mental development, adaptation skills, how parents provide an overview to children related to the learning process in elementary school, procedures for registering for elementary school and so on. The results of the survey show in detail related to the need for information, which is presented in the following diagram:

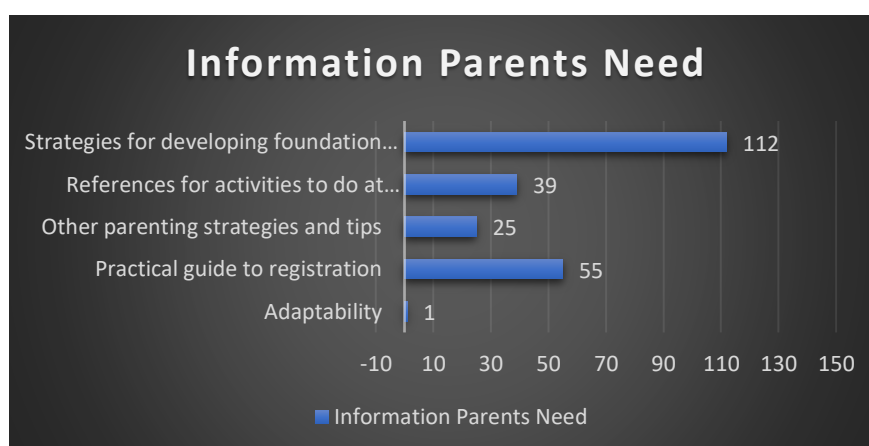


Figure 2. Information Parents Need

Figure 2 shows the interest and needs of parents regarding several sub-concepts of the transition of PAUD-SD. A total of 112 parents felt that they needed a discussion on strategies for developing foundational skills, numeracy and literacy; 39 parents felt the need for discussion regarding references to activities carried out at home with their children; 25 parents felt that they needed a discussion about strategies and tips from other parents who had experienced it, 55 parents felt that they needed a discussion about practical guidelines for registering new participants in elementary school and 1 parent felt that they needed a discussion about their children's adaptability.

Some parents expect content in a combination format, namely writing, audio and visual. CM and AR convey information presented in the form of visual videos that are considered easier to understand. In more detail, MS said:

"Yes, there is audio visual writing and it can make it easier for us, so so far the available media is only written and it is not interesting, especially if the font is too official, the language is too formal, sometimes it is also confusing to digest the information"

In addition to using easy-to-understand language, MS stated that the use of typefaces affects whether a reading is easy to understand or not. Therefore, the letters and language used should not be too standard and do not use terms that are rarely heard by parents.

3.3 Design and Development Stage of Digital Guidelines for Early Childhood and Elementary School Transition Based on Mobile Application for Parents

The development stage is divided into two parts, namely the development of PAUD.int application and the development of content that will be presented in the application. Therefore, the following is presented in more detail related to the stages of development:

3.3.1 Application development stage PAUD.int

During the development phase of the PAUD.int application, the researcher collaborated with a team of software development experts to bring the designed application to life. The process began with the creation of a mockup or conceptual design using the Canva application. This mockup served as a foundation for detailed discussions with the development team to refine the application's design. The PAUD.int development was divided into two components: a website and an Android-based application.

The PAUD.int website was designed as a platform for uploading content to be displayed in the application, while the Android-based PAUD.int application was intended for installation on parents' devices. The application was developed using Android Studio, utilizing the Java programming language, XML, and third-party tools like the YouTube API. The website was built with the Laravel framework, employing the PHP programming language and a MySQL database for content management and storage. This structured approach ensured the development of an integrated and functional system to support the needs of parents during the PAUD-SD transition.

Digital guidelines for the transition of PAUD-SD were developed based on a mobile application for parents, which is named PAUD in this study.int through various stages, namely needs analysis and application mockup design. The needs analysis was carried out on the basis of finding out the essential information that parents need to accompany their children during the transition period of PAUD-SD. So that the content of the application that will be designed is expected to be in accordance with the needs of parents who are directed to provide appropriate scaffolding for children.

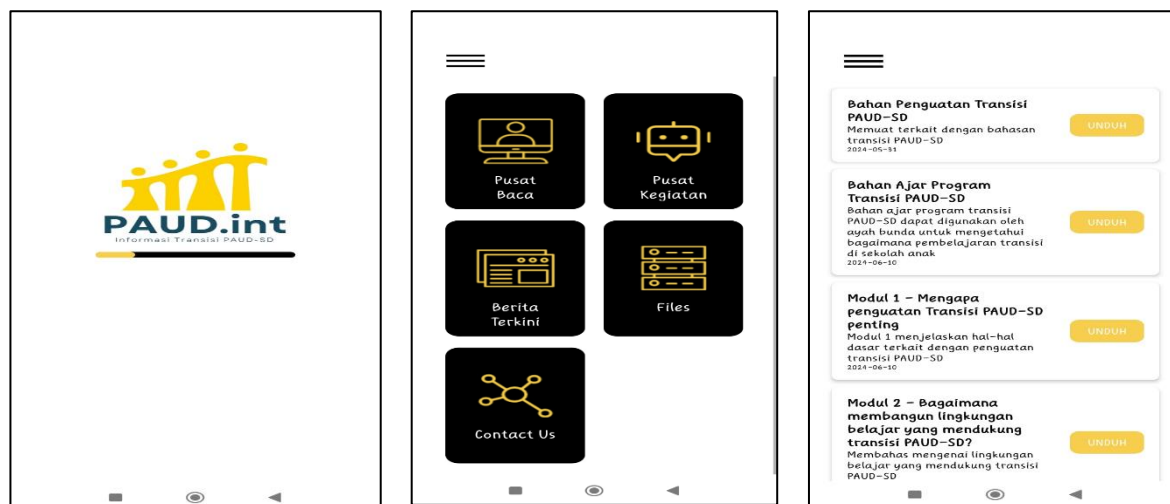


Figure 3. PAUD.int Application Web View

The development of PAUD.int is partly based on Vygotsky's theory of the Zone of Proximal Development (ZPD) (Langford, 2004). The core concept of ZPD refers to a set of skills or abilities that a child may struggle to master independently but can achieve with guidance or support from adults or more skilled individuals in their environment. Therefore, parents, as the primary adults supporting their child's growth and development, need to educate themselves to provide appropriate stimulation and guidance.

3.3.2 The content development stage of the application PAUD.int

The PAUD.int application is a forum for various content related to the transition from PAUD-SD. The content presented in the application PAUD.int refers to the results of the analysis of parental needs. Therefore, there are several menus and forms of PAUD.int content, namely:

Table 1. Menu on the PAUD.int App

No.	Menu	Explanation	Content Form
1.	Information Center	Contains guidelines for assistance during the transition period of PAUD-SD for parents	Writing in PDF form
2.	Reading center	A collection of news written by teachers, parents, and students	In-app writing
3.	Activity center	Inspirational videos for activities that can be done with children at home	Video
4.	Files	A collection of policies, teaching materials and so on that are related to the transition from PAUD-SD	PDF
5.	Contact Us	Email where you can contact us to send suggestions and criticism related to app development PAUD.int	Writing
6.	About Us	PAUD.int app description and developer identity	Writing

The content of the PAUD-SD transition guidelines for parents compiled in the information center menu is based on several related references. The sub-discussion in this section consists of an introduction; the basic concept of the transition of PAUD-SD; the role of parents during the transition period from PAUD-SD; children's rights during the transition period of PAUD-SD; stages of child development at the transition age of PAUD-SD and administrative preparation for elementary school.

The presentation of the PAUD-SD transition guidelines for parents is assisted using the canva application with the aim that the guidelines are less rigid and more beautiful to look at.

3.3.3 Implementation and Evaluation of the Introduction of Digital Guidelines for Early Childhood and Elementary School Transition Based on Mobile Application for Parents

The implementation of the introduction of digital guidelines for the transition of PAUD-SD based on mobile applications for parents is explained in accordance with the stages carried out as follows:

One-on-One Test

One-on-one testing on three parents with different educational backgrounds provides insight into the clarity, ease of use, and performance of PAUD.int app. DCW, a housewife with a 6-year-old child, has no difficulty installing or using the app, enjoying a simple and intuitive interface. In contrast, RTR, a mother working with 2nd graders, faced technical obstacles related to the login process because she did not have an active email, which highlighted the need to consider the design of the login page. The results of this test, which combines interviews and observations, show generally positive responses to the app, although there are some technical hurdles that require further attention in the next small group test to ensure that the app is easily accessible and usable by all users.

Small Group Test

In a small-group trial conducted on 19 parents from kindergarten and 11 from elementary school in Babakan Ciparay, between June 19-21, 2024, the PAUD.The int app was tested for effectiveness after an initial evaluation. This activity involves initial instructions on the use of the application, followed by assistance in installation, with the aim of identifying and addressing any issues that have not been revealed in the one-on-one test and verifying that the user can operate the application independently. Although there were some technical obstacles such as slow load times and the app suddenly shutting down, which happened to three users, this issue was resolved after the second attempt. Users expressed ease of use thanks to the user-friendly interface, including large navigation and clear text, which makes it easy to read and understand the content of the PAUD-SD transition, so they can use the app without further assistance.

Field Trial

The field trial was the final stage in the implementation of the PAUD.The application was conducted after a revision of the small group test and involved 56 parents of children in groups B, 1st grade, and 2nd grade of primary school. The field trial stage is part of the initial research project so that it uses a weak experimental design with the one-shot case study design model. This is adjusted to the use of The Technology Acceptance Processes (TAM) instrument to evaluate products before they are implemented massively. In addition, percentages based on TAM dimensions are presented in the following table:

Table 2. Percentages based on TAM dimensions

PU	83.31%	Strongly agree
PEU	82.94%	Strongly agree
IU	83.75%	Strongly agree

In the evaluation of the PAUD.int application, the Perceived Usefulness (PU) indicator recorded a very high number with 83.31% of users stating that this application helped and made it easier to find information about the transition from early childhood to elementary school. PU defines how users subjectively assess the app's potential to improve their performance in understanding their children's educational transition. The high level of approval on this aspect shows that the majority of users consider PAUD.int app to be an effective and useful tool, which supports them in accessing vital information necessary to accompany their children during this transition period.

Furthermore, the Perceived Ease of Use (PEU), which measures how easy an app is to use, also recorded a high score, with 82.94% of users who strongly agreed that the app was easy to use. The direct link between PEU and sustainable use decisions is illustrated in the concept of Behavior Intention to Use, where these two aspects significantly affect the user's tendency to continue using the system. Thus, PAUD.int applications are not only accepted for their high functionality but also for their ease of operation, which in turn, facilitates wider adoption and continued use by parents who need them.

The data obtained from the System Usability Scale (SUS) instrument scored the calculation results, the average final score was 75. The interpretation of the score of the calculation results is in the acceptable category at a good level.

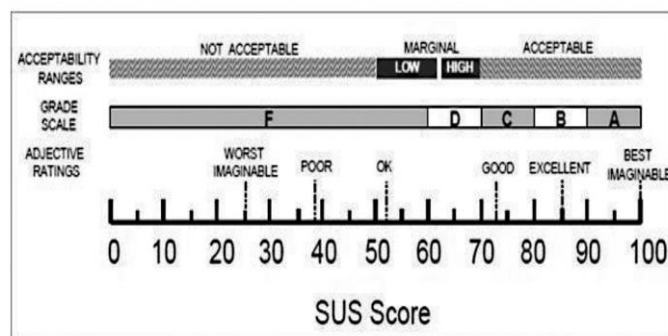


Figure 4. SUS Results

Figure 4 explains in more detail the position of the calculated value in the interpretation. Based on the usability evaluation that was carried out on the application PAUD.int the system usability scale method, an SUS score of 75 was obtained. The adjective rating is included in the good category, with a grade scale of C, and is included in the acceptable category for acceptability ranges. This data means that PAUD.int application can be accepted with a high acceptance rate.

Discussion

Understanding the transition from preschool to primary school is essential for parents as it has a significant impact on their children's educational journey. Parents who understand the challenges and adjustments involved in this transition can provide better support to their children, helping them navigate change effectively (Karuppiah, 2022). Research shows that parental involvement and awareness of the transition process play an important role in preparing children for the academic and social demands of primary school (Suoth, 2022). By understanding the importance of this transition, parents can actively engage with teachers and schools to ensure a smooth and successful transition for their children, ultimately contributing to their overall well-being and academic success (Çobanoğlu & Kumlu, 2020).

In 2023, Indonesia's Ministry of Education, Culture, Research, and Technology launched the "Early Childhood Transition Strengthening Booklet," which defines the transition from early childhood education to elementary school as the process of aligning learning between levels of education. The main goal of the initiative is to reduce the adjustment difficulties faced by learners, by developing and releasing six guidance modules designed specifically for teachers, and a website that provides guidance materials and relevant information. However, there is a lack of availability of specific materials to help parents accompany their children during this transition, creating gaps in support that should involve all stakeholders. Therefore, it is important for the Ministry to expand the focus of its resources to include not only educators and administrators, but also parents, in order to create a holistic and inclusive education ecosystem that supports all learners both in school and at home.

Many parents lack a comprehensive understanding of the transition from preschool to primary school and its profound impact on children. Some parents are of the view that the transition period is a period that children will instinctively be able to face without the need for special assistance from

parents. This misconception contradicts the opinion of Liu et al (2022) who state that the transition from preschool to primary school is a critical period for children, which often causes anxiety in children and parents. The research of Çobanoğlu & Kumlu (2020) even emphasizes the importance of parental understanding and support during this transition to facilitate smooth adjustment for children. Similarly, Lim et al (2021) emphasized that parental guidance and involvement play an important role in children's well-being and successful adaptation to the new school environment. Therefore, it is important to provide easy-to-access guidelines or guidelines to help parents navigate this transition effectively and ensure a positive experience for their children.

This knowledge gap underscores the need for accessible guidelines or guidance to assist parents in navigating this critical period effectively (Robayanti & Djoehaeni, 2024). Providing parents with clear and informative resources can empower them to better support their children through the transition process, ensuring that they are adequately prepared for the academic and social challenges of entering primary school. By offering accessible guidance, parents can play a more active role in facilitating a smooth and successful transition for their children, ultimately contributing to their overall well-being and academic success. Intang Sappaile et al., (2023) emphasized that the preschool-primary transition program requires understanding, transparency, and a reasonable period between preschool and elementary school organizations.

Researchers developed an application PAUD.int, which is a digital solution developed to assist parents in accompanying their children during the transition from Early Childhood Education (PAUD) to Elementary School (SD). Designed as a digital guideline that can be accessed via mobile devices, the app offers a variety of modules and information that parents need to understand and manage this transition process effectively. The app provides access to a wide range of information resources and practical guidelines specifically designed to increase parental involvement in their children's education, and has been tested for effectiveness through a series of evaluations involving the use of the Technology Acceptance Model (TAM) and the System Usability Scale (SUS), demonstrating high acceptance rates and significant usefulness for users.

The development of the PAUD.int platform is rooted in Vygotsky's theory of Zones of Prolonged Development (ZPD), which is particularly relevant to the transition from Early Childhood Education (PAUD) to Primary School (SD). Vygotsky's Zones of Proximal Development (ZPD) is a core concept in cognitive development theory that describes areas of learning that occur when a child is able to solve problems with adult guidance or through collaboration with more capable, but not yet independently peers (Mushtaq et al., 2024). Vygotsky's theory emphasizes the importance of social interaction and guidance from more knowledgeable individuals in facilitating the child's learning and development. By incorporating ZPD theory into PAUD.int platforms, parents can access tools and resources that align with the child's developmental readiness level, providing tailored support and guidance throughout the transition process (Xi & Lantolf, 2020). This approach ensures that parents can effectively accompany their children through this critical time, fostering supportive and enriching educational experiences that enhance children's growth and success as they transition to primary school.

Apps can play an important role in helping parents during the transition period from Early Childhood Education (PAUD) to Primary School (SD). These tools can provide parents with valuable resources, guidance, and support, helping them understand the complexities of the transition process and effectively accompany their children (Khuluqo et al., 2024). By offering easily accessible information and interactive features, such apps can empower parents to actively engage in their children's educational journey, improve communication with teachers and schools, and ensure a smoother transition experience for their children (Urbina-Garcia, 2020). In addition, Karuppiah (2022) asserts, apps can offer practical tips, strategies, and activities to help parents support their children's cognitive, social, and emotional development during this critical time, ultimately contributing to a successful transition and positive outcomes for children.

PAUD.int app plays a crucial role in supporting parents during their children's important transition from Early Childhood Education (PAUD) to Primary School (SD). By providing easily

accessible information and interactive features, the app allows parents to better understand the transition process and effectively accompany their children. This includes tools and resources tailored to help support children's cognitive, social, and emotional development during this critical period. The app also has the potential to strengthen communication between parents, teachers, and schools, ensuring a smoother and more successful transition experience for children. However, the app has limitations such as compatibility issues with tablet devices and a lack of registration features that reduce user interactivity, which indicates the need for further development and refinement to maximize its benefits to the parent community.

4. CONCLUSION

The development of the PAUD.int application is an initiative designed to assist parents in managing their children's transition from Early Childhood Education (PAUD) to Primary School (SD). This development process goes through five main stages: analysis, design, development, implementation, and evaluation. From the needs analysis, it was identified that parents need access to information online regarding the transition from early childhood to elementary school, with content that includes basic concepts of transition, child psychology, social-emotional development, adaptation skills, and elementary school enrollment procedures. Based on this analysis, the application is designed and developed to meet these specifications. The implementation of the app was tested through a series of tests including one-on-one tests, small group tests, and field trials, all of which showed a high level of acceptance from the users' parents. While the app is well-received and useful in supporting parental engagement, there is room for further improvement, especially in addressing technical issues such as compatibility with tablet devices and integration of registration features to improve interactivity and personalize the user experience.

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