Jurnal Pendidikan Anak Usia Dini Undiksha
Volume 12, Nomor 2, Tahun 2024, pp. 272-280
P-ISSN: 2613-9669 E-ISSN: 2613-9650
Open Access: https://doi.org/10.23887/paud.v12i2.77180

Stimulating Early Childhood Digital Literacy Through the Innovative Kiddyfun Platform

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ARTICLE INFO

Article history:
Received April 07, 2024
Accepted July 05, 2024
Available online August 25, 2024

Kata Kunci:
Literasi Digital, Stimulasi, Anak Usia Dini

Keywords:
Digital Literacy, Stimulation, Early Childhood

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ABSTRAK

Arus globalisasi memberikan dampak signifikan terhadap perilaku sehari-hari termasuk juga dengan pendidikan. Hal ini sebagai pertanda bahwa manusia harus selalu siap beradaptasi agar tidak tergerus oleh perkembangan zaman. Kenyataan di lapangan menunjukkan bahwa penggunaan literasi digital belum begitu optimal, karena guru hanya mengandalkan buku sebagai sumber belajar, sehingga anak mudah merasa bosan Ketika melihat kalimat yang panjang. Tujuan penelitian ini adalah menghasilkan Platform Kiddyfun yang efektif, efisien, dan menarik untuk menstimulasi kemampuan literasi digital anak usia 4-6 tahun. Subjek penelitian ini adalah 2 validator ahli materi, 2 validator ahli media, 4 pengguna (guru), 40 anak (usia 4-5 tahun) dan 40 anak (usia 5-6 tahun). Metode yang digunakan adalah penelitian pengembangan dengan model ADDIE. Teknik pengumpulan data menggunakan lembar observasi dan kuisioner kemudian di analisis menggunakan kuantitatif deskriptif. Hasil uji validitas ahli media memperoleh skor 89% (sangat layak), uji validitas materi memperoleh skor 94% (sangat layak), uji pengguna memperoleh skor 97% (sangat layak), hasil uji kelompok kecil memperoleh skor 100% (sangat layak), dan uji kelompok besar memperoleh skor 96% (sangat layak). Berdasarkan hasil tersebut dapat disimpulkan bahwa, inovasi Platform Kiddyfun sangat layak dan sangat menarik digunakan. Implikasi dari pengembangan media ini adalah dapat menambah referensi media pembelajaran berbasis digital untuk menstimulasi kemampuan literasi anak usia 4-6 tahun.

ABSTRACT

The globalization era significantly impacts daily behavior, including the field of education. This highlights the necessity for individuals to continuously adapt to avoid being left behind by rapid advancements. However, in practice, the utilization of digital literacy remains suboptimal, as teachers often rely solely on books as learning resources, which can lead to student disengagement when faced with lengthy texts. This study aims to produce the Kiddyfun platform, designed to be effective, efficient, and engaging in stimulating digital literacy skills among children aged 4–6 years. The study subjects included two material expert validators, two media expert validators, four teacher users, 40 children aged 4–5 years, and 40 children aged 5–6 years. The research employed a development method based on the ADDIE model. Data collection techniques involved observation sheets and questionnaires, analyzed using quantitative descriptive methods. The results showed that the media validity test scored 89% (highly feasible), the material validity test scored 94% (highly feasible), the user test scored 97% (highly feasible), the small group test scored 100% (highly feasible), and the large group test scored 96% (highly feasible). Based on these results, it can be concluded that the innovation of Kiddyfun platform is highly feasible and engaging. The implication of this media development is its potential to enrich digital learning resources to stimulate literacy skills in children aged 4–6 years.

1. INTRODUCTION

The rapid development of globalization 4.0 has resulted in progress in the field of Science and Technology (IPTEK) which has had a major impact on aspects of life in society, one of which is education (Rahayu et al., 2023; Latip, 2020). Several previous studies have stated that society is becoming smarter and more skilled at using technology (Fauziah et al., 2023; Cahyarini, 2021). This shows that Indonesian

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people are increasingly skilled in using digital technology in daily activities, including in the learning process.

This increase in digital literacy has a significant impact on increasing the accessibility and effectiveness of learning. With better digital literacy, children can access online learning resources more easily. They can also utilize various digital applications and platforms to deepen their understanding of various concepts and subject matter. Therefore, the development of globalization 4.0 and increased digital literacy provide great potential in improving the quality of education in Indonesia, because basically, education is an effort to enable adults to develop the potential of students to have spiritual strength, personality, intelligence and noble character and have skills (Sumiati & Tirtayani, 2021; Zeptyani & Wiarta, 2020; Elan et al., 2017). However, to be able to optimize this potential, there needs to be continuous efforts in developing technological infrastructure, improving teacher competence in using technology.

Indonesia's increasing digital literacy index is inversely proportional to the still low level of literacy skills. Several previous studies have stated that Indonesian students' literacy is still relatively low.(Navida et al., 2023; Anisa et al., 2021). The gap between high internet usage and low reading interest rates brings potential vulnerability to children being exposed to negative content or less productive internet usage, resulting in wasted time and resources. There needs to be positive content development as part of the digital literacy movement (Terttiaavini & Saputra, 2022; Rahmawan et al., 2019).

Digital literacy has great relevance to children's reading interest, especially in the context of developing interactive media to stimulate digital literacy, with digital literacy children can more easily access various types of interesting digital reading materials, making it easier for children to understand content critically and analytically with the help of images, sounds, as well as introduction to letters, syllables, and simple words in children. In terms of early childhood education, technology plays a role in enriching children's learning experiences with the availability of various interactive applications, as well as providing many very varied and interesting digital learning resources (Mulyani & Haliza, 2021; Sutama et al., 2021). This makes learning more fun and is able to provide an understanding of abstract concepts in a more concrete way through animated visualization (Aryani & Ambara, 2021; Kurnia, 2020). IPTEK can provide positive impacts that are felt in the field of education, as well as PAUD. The positive impacts include improving the quality of learning; facilitating access to find learning references that can support children's learning, developing children's creativity through the development of interactive websites and games, as a means to facilitate communication, and to stimulate children's digital literacy (Monalia, Asfiyanti, & Putri, 2022; Pasys, 2023; Syahroni, 2020). In addition, pLearning can be said to be successful if it has an impact on changes in behavior and knowledge that occur in children.(Rodiah & Watini, 2022; Syawaluddin, Siregar, Megawati, & Samsir, 2021; Anida & Eliza, 2020). Digital literacy is an individual's ability to access, understand, evaluate, and use information digitally (Anisa, 2023; Naufal, 2021). The Ministry of Education and Culture defines digital literacy in early childhood as the attitude, knowledge, and skills of children in using digital media around them to search for and utilize information, learn, play, or get entertainment in a healthy way with guidance from adults around them (Ulfah & Yusriyyah, 2025; Hasanah, 2023).

Based on this, it can be concluded that digital literacy is very important for children because it helps them develop the skills needed to succeed in this digital era, with digital literacy children can learn how to use technology effectively and responsibly, access information more easily, and develop critical skills needed to understand and evaluate information online. In addition, digital literacy also helps children prepare for a future that is increasingly dependent on technology. Meanwhile, the situation in the field shows that children aged 4-6 years have a low level of interest in reading. It can be seen through children feeling bored quickly when reading printed story books because they experience limitations in the ability to read long sentences and limited stimulation from educators, but children are very enthusiastic when they see the pictures in them. Therefore, effective learning is needed so that children can easily map concepts and analyze the material received. Learning must be designed in such a way that children can actively participate so that children will be involved in taking action based on the choices they make. This will not only make the learning experience more interesting, but will also increase the effectiveness of the child's learning process. This kind of action can not only instill digital literacy but also as an effort to develop cognitive skills to sharpen children's thinking skills (Pahenra, 2020; Tatminingsih, 2019). Based on the above problems, an innovative solution is needed in the form of developing integrated digital literacy services that include learning materials and educational games. This service must be equipped with interactive and interesting audio visuals, so that it can optimally stimulate the digital literacy skills of children aged 4-6 years. The development of the Kiddyfun Platform is adjusted to 21st century skills, namely the ability to use digital technology in learning while still paying attention to the learning achievements of the independent curriculum and efforts to fulfill digital learning media according to children's learning styles.

This solution is in line with the statement that explains that digital media supports children to see, hear, create, manage information and follow the directions given and is in line with Payton & Hague's theory

which states that digital literacy is an individual's ability to apply functional skills to digital devices so that they can find, select information, think critically, be creative, collaborate with others, communicate effectively, and still pay attention to electronic security and the developing socio-cultural context (Naufal, 2021; Mustofa & Budiwati, 2019). Several other research results also explain that the website-based digital platform "Literacy Cloud" can increase children's interest or culture of reading digitally (Yuliati et al., 2022; Basar, 2021). In stimulating children's digital literacy, interesting, effective and efficient means and facilities are needed (Gani & Hidayat, 2023; Hamidatussholihat & Rohmalina, 2023).

The advantage of the Kiddyfun Platform media is that it is packaged in digital form that can be accessed on PC, Tablet, iPad, iOS, or Android. In addition, this platform contains several spaces, namely a reading room (containing the latest information related to children, parenting, and the world of PAUD), a storytelling room (containing audio visuals for children), a singing room (containing a collection of children's songs), an exploration room (containing STEAM learning content), and a playroom (a place for children to create projects that lead to strengthening digital literacy). Several previous studies have revealed that the use of Literacy Cloud can be a fun alternative and can be a source of safe and interesting digital reading for children, in addition, children's literacy skills can stimulate children's abilities in terms of understanding, acceptance, and interpretation through visual and audio verbal symbols (Sary & Indah, 2023; Basar, 2021). It's just that in previous research, digital literacy media developed for children was still one-way, namely children only received and understood information from the videos presented.

Based on this, the novelty of the development of the Kiddyfun Platform is the media developed to contain STEAM-based exploration space and play space that allows children to actively participate in learning. This study aims to develop the Kiddyfun Platform while also determining the level of feasibility and attractiveness of the Kiddyfun Platform. The results of this study are expected to add references to digital-based learning media to stimulate the literacy skills of children aged 4-6 years.

2. METHOD

This study uses the type of development (research and development) with the ADDIE model. The reason for choosing this model is because the ADDIE model has a simpler, more complete, and easier to understand research flow, so using this ADDIE model is suitable for developing game media. In this study there are 5 stages according to the ADDIE model including: a) the needs analysis stage (analyze), at this stage the researcher conducts initial observations to the kindergarten that is the target of the research object to analyze the needs of the Institution; b) design planning (design), at this stage the researcher plans a solution while making a storyboard related to the appropriate media to answer the problems in the field; c) development (development), at this stage the Kiddyfun web is developed; d) implementation (implementation), at this stage the researcher asks for an assessment from the media expert validator, material expert, and user trial; e) evaluation (evaluation), at this stage the researcher evaluates the shortcomings of the media based on suggestions from the validators for further improvements.

The subjects involved in this study were two material experts, two design experts, children aged 4-5 years with a small group test classification of 10 children and a large group of 30 children, children aged 5-6 years with a small group classification of 10 children and a large group of 30 children. The data collection technique used a questionnaire given to experts, while for the achievement of children's abilities in playing games, the questionnaire and observation sheets of the children were filled in by the researchers themselves. This questionnaire was used to obtain data related to the feasibility of the Kiddyfun platform that was developed. The data that had been collected was analyzed using descriptive quantitative to obtain measurable data accompanied by a clear explanation of the data. The Kiddyfun platform, which was designed for children aged 4-6 years, was declared successful and could be used as an alternative media for digital literacy if it met the criteria of being very interesting, very effective, and very efficient with a percentage value between 80% and 100%, then the Kiddyfun platform was considered very feasible for further testing.

3. RESULT AND DISCUSSION

Result

The results of this study will discuss two things in general, namely the concept of game media and the validity of the Kiddyfun platform. The concept of this game media was developed using the ADDIE model which consists of 5 stages, namely needs analysis (analyze), design (design), development (development), implementation (implementation), and evaluation (evaluation). Some things that are developed in this platform include the Kiddyfun Platform being developed into several centers. First, a storytelling room containing a compilation of children's stories that contain meaning and as daily life learning, this room can be useful for training children's understanding of the contents of the story presented. Second, a playroom

that provides opportunities for children to play guessing words, write, and color the pictures that have been provided. Third, a singing room containing a compilation of early childhood songs. Fourth, an exploration room containing a compilation of STEAM-based videos that can stimulate children's analytical skills and curiosity. Fifth, the reading room contains a compilation of simple stories that can be a source of digital-based reading for children. provides various compilations of children's songs. Researchers have provided various content as learning resources, so that users can choose which content they want to learn. Meanwhile, validity is used to determine the feasibility of the Kiddyfun platform carried out by early childhood material experts, children's game media experts, and children aged 5-6 years from two institutions.

The first stage of needs analysis, researchers conducted observations at the UM Laboratory Kindergarten regarding the implementation of overall learning along with the integration of the use of technology in learning. Observation results show that IT has been implemented, but it still tends to be one-way and monotonous so that children often feel bored. Therefore, it is necessary to develop game media that is specifically designed so that children can interact with IT. The Kiddyfun platform in this study was designed with several rooms, namely a reading room, singing room, exploration room, and playroom. The goal is for children to be able to learn gradually and provide a more interactive learning experience, stimulate creativity, and develop children's skills, while still considering relevant educational values. The second stage is design. At this stage, the researcher develops a design (planning) or blueprint for the Kiddyfun Platform, which includes a platform story board, state transition diagram design, learning content, games, and sound. This story board will be used as a guideline for developing the product. The third stage is development, which is creating a product based on the story board that has been prepared. At this stage, the researcher also tries to find references for animations and transitions to support the attractiveness of the media. Then, select the elements contained in the media such as determining the color, contrast, images, animations, font types, font sizes, and audio used. The results of the Kiddyfun platform development can be presented in Figure 1.

Figure 1. Design Kiddy Fun Platform

The fourth stage is implementation. At this stage, the researcher asked for validation from two lecturers who are material experts and two lecturers who are media experts. This validation is useful for getting feedback in terms of the suitability and meaningfulness of the content according to the material experts as well as feedback on the attractiveness and efficiency of the media according to the design experts. After being declared feasible, the researcher continued the direct trial to 40 children aged 4-5 years, and 40 children aged 5-6 years. The fifth stage is the evaluation stage which plays a role in assessing the success or suitability of development. Kiddy fun platform that has been planned. Evaluation aims to improve the product by utilizing feedback from experts obtained through expert testing of learning materials, expert testing of learning designs, and user trials. The evaluation process does not only take place at the final stage of development, but is also integrated into each stage of the ADDIE development model. The evaluation results include the validity of the development Kiddy fun platform based on the assessment of learning content experts, learning design experts, learning media experts, and the results of product trials with child participation. In short, the results of product validation and trials can be presented on Table 1.

Based on the results of the table above, it is known that the overall validation data of the Kiddyfun Platform achieved a total empirical score (Tse) of 418 with a percentage of 93% which has the criteria of being very interesting, very effective, and very efficient. This means that the Kiddyfun platform is considered very suitable for use in interactive learning for early childhood because it provides various videos, games, songs, stories and worksheets for early childhood, making it easier for teachers to carry out learning in class and make students excited and enthusiastic about participating in learning activities in class. The results of small group trials can be presented at Table 2.

Table 1. The Percentage of Validation Results

No.	Expert Validation Statement	Tse	Tsh	P
1.	Media Expert Validator	117	128	89%
2.	Subject Matter Expert Validator	68	72	94%
3.	User Expert Validator	233	240	97%
	Total scores obtained	**418**	**440**	**280%**
	Average			**93%**

Table 2. The Small Group Trial Results

No.	Rated aspect	Tse	Tsh	P
1.	Attraction	60	60	100%
2.	Effectiveness	100	100	100%
3.	Efficiency	60	60	100%
	Total scores obtained	**220**	**220**	**300%**
				100%

Based on the table above, it can be seen that the results of the small group trials show that in terms of attractiveness, effectiveness and efficiency of the media Kiddy fun platform get 100% results so from these results it is proven that Kiddy fun platform very interesting, very effective, and very efficient to stimulate digital literacy of children aged 4-6 years. Based on the results of expert validation, there are rKiddyfun Platform product revision as a suggestion for media improvement. Some of the optional suggestions include: (1) The need for a symbol/figure/mascot on a platform will be more easily recognized by children for brand development on the platform or other activities; (2) Adding a gallery space as a place for children's work, product usage documentation, and best practice videos; (3) Reviewing the activities and materials available on the Kiddyfun Platform according to the learning ability goals to be achieved; (4) The Kiddyfun Platform is already good, innovative, and creative, but learning materials must continue to be developed according to interesting learning topics in order to meet user needs over time so that the product continues to provide newness and benefits on an ongoing basis. The results of large group trials can be presented at Table 3.

Table 3. The Large Group Trial Results

No.	Rated aspect	Tse	Tsh	P
1.	Attraction	180	180	100%
2.	Effectiveness	287	300	95%
3.	Efficiency	169	180	93%
	Total scores obtained	**636**	**660**	**288%**
				96%

Based on the table above, it can be seen that the results of the large group trial show that in terms of attractiveness it gets a percentage of 100% (very interesting), in terms of effectiveness it gets a value of 95% (very effective), and in terms of efficiency it gets a value of 93% (very efficient). Thus, it can be concluded that Kiddy fun platform very interesting, very effective, and very efficient to stimulate digital literacy in children aged 5-6 years.

Discussion

Based on the data presentation above, it can be said that the Kiddyfun Platform is very interesting and very suitable to be applied to children aged 4-6 years to stimulate digital literacy in the midst of this technological globalization. Digital literacy is very important to be developed as a need that can participate in the digital world as with reading, writing, arithmetic and other sciences. Digital literacy is important to pay attention to in children. The importance of introducing digital literacy helps students to gain the technical knowledge and skills needed to operate digital media effectively, be skilled when using digital media, and foster a positive attitude regarding readiness to keep up with the development of the digitalization era.

There are several factors that influence the success of this media development. First, the Kiddyfun Platform media is very feasible/effective for stimulating digital literacy skills, early literacy skills, analytical skills and creativity in children aged 4-6 years. This is because the Kiddyfun platform provides a STEAM-based exploration space that is useful for stimulating children's curiosity and critical thinking skills. At the

end there is also a slide that gives children the opportunity to color pictures and guess animals according to the theme provided. This will encourage children to have good reasoning so that children's thinking skills will be more complex (Wirasasmita & Putra, 2018; Nugraha et al., 2017; Purwati et al., 2016). In addition, the freedom to create through the images provided also allows children to convey their unique ideas, collaborate with others, solve problems, and understand different perspectives (Hayati & Na'imah, 2022; Dyah & Setiawati, 2019).

In the playroom, children are also invited to write simple words that aim to stimulate phonological awareness so that children are able to detect, combine, or summarize words, because the quality of literacy stimulation in the foundation phase will determine the quality of children's understanding in the next phase. This opinion is in line with the statement that one of the literacy skills is reading and children's early reading skills predict academic achievement later in life. Early literacy skills include important indicators of word reading, such as letter knowledge (i.e., being able to recognize and name letters), knowledge of letter-sound correspondence (e.g., being able to match the sound /m/ with the letter "m"), phonemic awareness (e.g., dividing the word "mat" into /m/ /a/ /t/), and concepts about print (i.e., knowledge of reading conventions, text direction, book structure), and handwriting or writing letters and words (Satriana et al., 2022; Fatimah, 2020).

Second, the Kiddyfun Platform can attract attention and foster children's enthusiasm for learning while playing. This is because this media is equipped with animations for children, eye-catching colors, interesting audio according to the child's age, and a simple and easily recognizable playroom design for children. In addition, a simple and easily recognizable playroom design is also important because it can help children feel comfortable and focused while learning. Learning will run well and effectively if learning is well designed and in accordance with the characteristics of learning and students (Susantini & Kristiantari, 2021; Kukuh et al., 2017; Jiwaningrum & Suryono, 2014). With the combination of all these elements, the Kiddyfun Platform may be an effective tool to facilitate children's learning in a fun and interactive way. Basically, media as a means of conveying information plays an important role in the success of the learning process (Ayu & Manuaba, 2021; Wulandari & Ambara, 2021; Syafruddin, 2019).

This is in accordance with the opinion that states that the criteria for media that can attract children's attention are media that are equipped with writing, audio, color, and funny animations or do not tend to be stiff when used in kindergarten. In addition to adding to the aesthetics of the media, children's interest in playing the media will affect the child's emotional state so that children will find it easier to understand the material with the help of image visualization (Fransisca et al., 2020; Fithri & Setiawan, 2017). This is also supported by the results of previous research which states that attractive media design will provide positive stimulation to children so that it can improve children's learning outcomes (Nirwanto, Murtono, & Fathurrohman, 2021; Widyatmoko, 2019; Ciptaningrum & Mintohari, 2018). In addition, early childhood children tend to have characteristics of getting bored easily and having difficulty focusing on the learning process, so the use of media that can increase the active role of students is very much needed to support the success of the learning process (Wulandari et al., 2022; Wondal et al., 2020).

Third, in terms of efficiency, the Kiddyfun Platform is very easy and practical to use anywhere and with any device ranging from laptops, tablets, iPads, iOS, or Android, it is also equipped with instructions and steps for use that make it easier for teachers and parents who accompany children, so that children will be more helped to understand the concept of this digital media. Through a combination of easy access and good usage guides, the Kiddyfun Platform has been designed to ensure that users, both children and adults, can optimally utilize this platform to learn efficiently and effectively. The results of this study are in line with previous studies which reveal that digital media can stimulate children's literacy skills (Rihlah et al., 2022; Satriana et al., 2022).

The innovation of the Kiddyfun Platform has implications for the addition of alternative media or variations of learning resources based on strengthening digital literacy for children aged 4-6 years that are interesting, effective, efficient, and economical for adults, especially PAUD practitioners as controllers of child learning policies. The limitations of the Kiddyfun Platform media are that it is only available online, so it requires a stable internet network and only focuses on digital literacy skills starting from listening, processing, and expressing the information received. Further research can provide Kiddyfun Platform media in offline form such as applications or can be downloaded. In addition, games can also be expanded by providing games that can hone STEAM or problem-solving skills, so that they can improve children's high-level thinking skills.

4. CONCLUSION

Based on the findings and data analysis presented above, it can be concluded that the Kiddyfun Platform innovation is very feasible and very interesting to be developed and applied in early childhood learning. This is because the media can stimulate children's digital literacy, considering its significant benefits in supporting literacy needs in the midst of globalization. Therefore, this media helps children

adapt more easily to changing times. This success is also influenced because the design of the Kiddyfun Platform media in its development has been in accordance with the ADDIE procedure, so that optimal results are obtained.

5. ACKNOWLEDGE

Acknowledgements are given to the Early Childhood Education Teacher Education Study Program, State University of Malang and the place where the research was conducted, namely UM Laboratory Kindergarten. Not to forget all parties involved in the implementation of this research.

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