Journal of English Language and Education
ISSN 2597- 6850 (Online), 2502-4132 (Print)
Journal Homepage: https://jele.or.id/index.php/jele/index

OPEN ACCESS Article

Development of an English Learning Model for Early Childhood Education (ECE) Using Multimedia-Based Interactive Media

https://doi.org/10.31004/jele.v10i5.1452

*Afdhalina, Nurmala Sridewi[ab]
[12]Battuta University, Indonesia.
Corresponding Author: afdhalinakahar@gmail.com

A B S T R A C T

This study explores effective English language learning strategies for early childhood, emphasizing the importance of early exposure to prepare children for the global era. The research employs a Research and Development (R&D) method using the Borg & Gall model, which includes five stages: Preliminary Research, Product Development, Product Validation, Product Trial, and Product Dissemination. This approach focuses on designing and implementing an interactive, multimedia-based learning model. The goal is to create a fun, creative, and engaging learning experience through interactive media, helping children better understand and master English. The findings are expected to offer new insights into effective teaching methods that significantly improve children's English language skills.

Keywords: *Learning Model, English Language, Early Childhood, Interactive Media, Multimedia*

Article History:
Received 18th August 2025
Accepted 09th September 2025
Published 12th September 2025

INTRODUCTION

ECE Ibunda Sayang, located in Medan City, is an early childhood education institution dedicated to providing a safe, enjoyable, and developmentally appropriate learning environment for children. The school has recently introduced basic English learning as part of its daily thematic activities. Through songs, stories, and simple classroom activities, children are gradually introduced to English vocabulary. However, the current learning process is still conventional and has not yet integrated multimedia-based interactive media. As a result, some children experience difficulties in understanding the material. This condition highlights the need for innovative teaching strategies that utilize engaging and developmentally appropriate interactive media to enhance comprehension, interest, and active participation.

The importance of Early Childhood Education (ECE) has been emphasized by various experts. According to Susantini (2021), ECE plays a fundamental role because meaningful stimuli provided at an early stage significantly influence a child's later development. Similarly, Dhieni (2020) argues that early childhood is a golden phase where proper educational interventions determine growth outcomes. Furthermore, Law No. 20 of 2003 on the National Education System defines ECE as nurturing efforts for children from birth to six years old through educational stimuli. The aim is to support both physical and mental development so that children are optimally prepared to pursue higher levels of education (Afdhalina, 2022).

The introduction of English at the early childhood level has sparked different perspectives among educators and parents. Penfield's brain mechanism theory suggests that early childhood is the most effective stage to introduce a second language, as children's brains are more flexible and adaptive to linguistic input (Dewi, 2020). In the modern era, young children are already exposed to English-based digital media through games, songs, and videos. This creates both opportunities and challenges in fostering language skills. To maximize the benefits, strategies that stimulate and optimize children's English development are essential (Na'imah, 2022).

Another phenomenon observed is the rapid emergence of tutoring institutions and language courses that even target ECE-level children. This reflects the strong aspirations of parents who wish for their children to achieve proficiency in a foreign language, particularly English. The demand for early English learning continues to grow in Indonesia, showing how deeply embedded the obsession with foreign language mastery has become in society. This parental expectation further strengthens the urgency for ECE institutions to adopt effective and engaging methods in teaching English.

Despite this growing demand, Indonesia's overall English proficiency remains relatively low compared to other countries. According to the EF English Proficiency Index (2017), Indonesia ranked 39th out of 80 countries with a score of 52.15, categorized as low. This condition is attributed to the lack of balance and consistency in English teaching methods across educational institutions. Dja'far (2017) highlighted that most students' English proficiency was still unsatisfactory, with only 50% showing improvement in speaking skills and 30% in writing, mainly to prepare for job applications. This data reflects the gap between expectations and outcomes in English education.

In practice, ECE English teaching methods often rely heavily on traditional approaches. Pertiwi (2021) reported that the singing method accounted for 62% of teachers' strategies, followed by imitation or drilling methods at 25%, and games at 13%. While singing and drilling can help with memorization, these methods may not fully engage children or encourage deeper understanding. The lack of interactive and multimedia-based tools also limits the effectiveness of English learning. Therefore, there is a pressing need for ECE institutions like Ibunda Sayang to innovate by adopting more visual, interactive, and play-based media that align with children's developmental needs and learning styles.

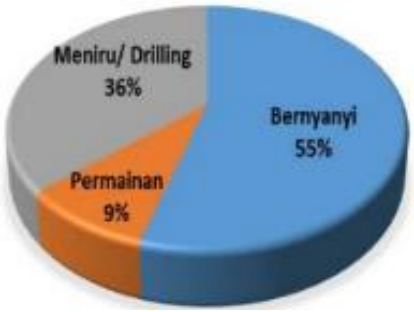

Figure 1. English Vocabulary Learning Method for Early Childhood Education
Source: Kumara Cendekia Journal (Pertiwi, 2021)

Early Childhood Education (ECE) plays a crucial role in a child's development, including in English language proficiency. However, many schools face limitations in interactive learning tools that can capture children's interest. To overcome this, a viable solution is to develop multimedia-based learning media that combines images, audio, and video. This media will leverage fun learning methods, such as singing, games, and drilling, to enhance children's understanding of English. After the media is piloted and evaluated, training for teachers and socialization for parents should be conducted to optimize the learning process. With this approach, it is hoped that interactive multimedia-based learning media can be an effective solution to improve English language skills in early childhood in a more engaging and effective way, helping them to be better prepared for further education with improved language abilities.

METHOD

Development

This research uses the Research and Development (R&D) method developed by Borg and Gall (Sutanto, 2021). The product is an English language learning media for Early Childhood Education (ECE) that uses interactive multimedia. This method's concept will provide easily accessible information through attractive visuals (Audio-Visual) and multimedia graphics (Schunk, 2012). The research stages are as follows:

Development of an English Learning Model for Early Childhood Education (ECE) Using Multimedia-Based Interactive Media

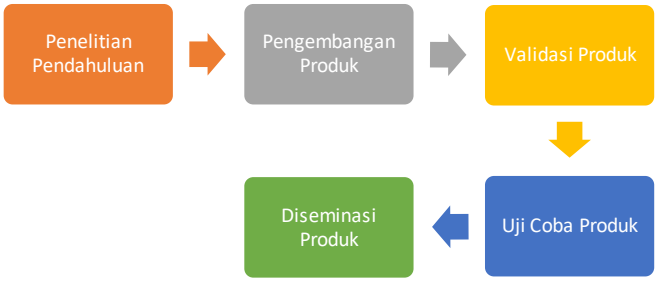

Figure 2. Multimedia-Based R&D Method

Preliminary Research

This initial phase focused on needs analysis and a literature review. The researcher used questionnaires and observations to identify the gaps in effective interactive media at Ibunda Sayang Preschool. Simultaneously, the researcher conducted a comprehensive study of relevant theories in early childhood English learning, interactive media, and R&D methodology.

Product Development

In this stage, the research concept was transformed into a tangible product. The activities involved:

Design: Creating the concept and storyboards for the interactive media, including determining the topics (e.g., colors, numbers, animals), characters, and flow.

Production: Building the multimedia-based interactive media product, such as an application or software, in accordance with the established design.

Product Validation

This phase aims to assess the product's feasibility from an expert perspective before testing it with users. This includes:

Material Expert Validation: Researchers consult subject matter experts in education or English to evaluate the accuracy of the content, appropriateness of vocabulary, and learning sequence.

Media Expert Validation: A multimedia expert is consulted to assess the quality of the visual design, navigation, and overall functionality of the media

Product Trial

This stage aims to test the effectiveness and practicality of the product in a real-world setting. Key activities were:

Limited Trial: Conducting a trial with a small group of children to observe their responses and engagement.

Outcome Measurement: Using a pre-test and post-test to compare the children's vocabulary mastery before and after using the media.

Evaluation: Gathering feedback from teachers and children to identify areas for improvement.

Product Dissemination

The final stage focuses on disseminating the product and research findings to a wider audience. This involved:

Implementation: Integrating the interactive media into the curriculum at ECE Ibunda Sayang.

Publication: Writing a final report and an academic paper for submission to a journal or conference, allowing the findings to serve as a valuable reference for other educational institutions.

Research Data

Conducting field surveys Aims to collect data according to parameters and indicators of the main concepts within a specific theoretical framework. The data sought and collected must be aligned with "answering the research questions" to achieve the research objectives.

Observation Aims to obtain data or information from an observed object. This data or information will then be shared with other parties in the form of a scientific or non-scientific work.

Literature Study

The data collection methods used in this research include:

Reference Data: includes literature related to interactive learning media, early childhood learning style theories (Schunk, 2012), instrument validity and reliability (Putra, 2024), and relevant previous research findings.

Instrument Development: instruments such as questionnaires and observation sheets are developed based on theories and validity standards (Putra, 2024) from the literature, and are adapted to the research objectives.

Research Design: uses a quasi-experimental design (Creswell, 2017) with control and experimental groups in field trials; it also includes statistical analysis to test the effectiveness and reliability of the instruments.

Research Process and Stages

The aim is to develop and test the effectiveness of multimedia-based English learning media for early childhood (ECE). The R&D method follows a systematic and structured process (Wahyuni, 2020), consisting of the following steps:

Stage	Description
Problem Identification	Identifying the challenges and needs of English learning in ECE.
Planning & Design	Designing the concept of multimedia-based learning media suitable for a child's age.
Prototype Development	Creating a prototype of the learning media with interactive elements (audio, images, video).
Trial & Evaluation	Testing the prototype in ECE and evaluating its effectiveness and the responses from teachers and children.
Refinement & Revision	Perfecting the prototype based on feedback and evaluation results from the trial.
Implementation & Widespread Use	Implementing the learning media more widely in ECE and providing training for teachers.
Ongoing Monitoring & Evaluation	Monitoring the use of the media and evaluating its long-term impact.

FINDING AND DISCUSSION

Identification Stage

This stage involves a deep analysis of the problem to formulate the right solution.

Needs Analysis:

Identifying the most relevant basic English topics and vocabulary for ECE children, such as recognizing letters, numbers, colors, names of days, animals, and body parts.

Analyzing the learning styles of early childhood children, which tend to be visual, kinesthetic, and auditory. This emphasizes the need for media that combines elements of images, sounds, and interaction in the form of videos.

Identifying appropriate technologies and software for media development. In this research, Figma is used because it is easy to use and accessible, and the resulting product is licensed for Google Play.

Interviews and Observations:

Conducting socialization with students' parents so the learning process can be more optimal.

Conducting interviews with the headmaster and teachers of ECE Ibunda Sayang to understand the teaching challenges they face and get input on the required materials.

Directly observing the learning process in the classroom to see children's responses to existing methods and identify areas for improvement.

Design Stage

Designing the prototype of the learning media.

Concept Design:

Storyboard

The interactive learning module "Learning English for ECE Children" is designed with the objective of helping children recognize the names of basic colors in English—red, yellow, and blue—through engaging and developmentally appropriate media. The first scene serves as the opening screen (intro), displaying a bright and cheerful background with illustrations of happy children reading together. At the center of the screen, the title "ECE IBUNDA SAYANG" is shown along with the subtitle "Learn English for Kindergarten", accompanied by an automatic Start button at the bottom to begin the program.

The second scene presents the main menu selection, set against a colorful natural landscape background with the welcoming text "Hello, Little Friends." In front of this background, several menu options appear, each representing a different English learning module. These include Alphabets, Numbers, Body Parts, Colors, Days of the Week, and Animals. Each menu is paired with animated visuals and distinct colors—for example, the Alphabets menu shows a letter A with arms in red, the Numbers menu displays a number nine with legs in purple, the Body Parts menu shows a smiling child in yellow, the Colors menu presents a rainbow, the Days of the Week menu displays a calendar in red, and the Animals menu features an owl in brown. Clicking on each option directs children to the respective learning module.

In the third scene, children enter the basic English learning modules, where the display and interactions adjust depending on the chosen topic. For the Alphabet Module, the first screen shows the entire alphabet from A–Z. When a child moves the cursor over a letter button, a new screen appears with uppercase and lowercase letters, an animated picture, the English word associated with that letter, a microphone icon button, and a person icon button. Clicking the microphone button plays a voice pronouncing the letter and a related English word (e.g., "A for Apple"), while clicking the person button provides the Indonesian equivalent. Similarly, the Colors Module displays three main objects (a child, a fruit, and a color) along with microphone and person icons. The microphone button pronounces the color in English ("RED," "YELLOW," "BLUE"), and the person button explains its meaning in Indonesian. Through this design, children can actively engage by listening and repeating both English and Indonesian pronunciations.

Finally, the fourth scene is the closing section, where the screen automatically ends when the application is exited. An Exit button is provided as an interactive element to close the program. This structured flow—from the cheerful introduction, engaging main menu, interactive learning modules, to the simple closing—ensures that children learn English vocabulary, especially basic colors, in an enjoyable and memorable way.

Figure 3. Prototype Design of the English Application for ECE (Audio, Images, Video)

Licensed by Google for each learning module. This storyboard will visualize the plot, text, images, and interactions that will be in the media. Choosing a theme with attractive colors for children.

Selection of Visual and Audio Design:

Choosing bright, child-friendly, and relevant characters, illustrations, and animations.

Recording narration by a speaker with a clear accent and selecting cheerful sound effects for children.

Figure 4. App Display on Google Playstore

Development Stage

This stage involves developing the prototype into a final product.

Media Production:

Using Figma to create interactive modules. Each module will contain a combination of images, text, audio, and interactive activities.

Integrating interactive features such as clickable buttons, audio, and visual responses.

Module Creation:

Developing thematic modules:

Colors Module: Children can click an audio button to hear the color's name in English and Indonesian, and click a person icon to practice pronunciation based on the audio they hear.

Numbers Module: Children can identify objects and click the corresponding number to hear its name in English and Indonesian, and click a person icon to practice pronunciation based on the audio they hear.

Animals Module: Children can click an audio button to hear the animal's name in English and Indonesian, and click a person icon to practice pronunciation based on the audio they hear.

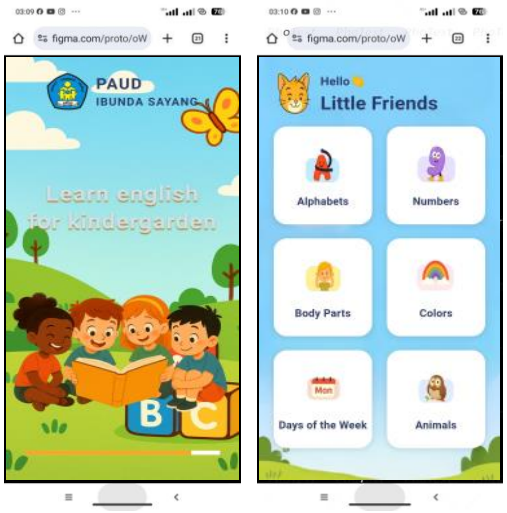

Figure 5. Development of the English ECE Application Prototype (Audio, Images, Video)

Trial Stage

This stage aims to test the effectiveness and feasibility of the developed media.

Product Validation by Experts: Assessing the feasibility of the English learning product for early childhood education (ECE) using interactive multimedia, as evaluated by material and media experts.

Table 1. Validation Results from Material Experts, Media Experts, Child Observation, and Teacher Questionnaire

Validator	Score	Percentage (%)	Category
Media Expert	4	74	Very High
Material Expert	4	72	Very High
Child Observation	4	70	Very Feasible
Teacher Questionnaire	3	68	Very Feasible

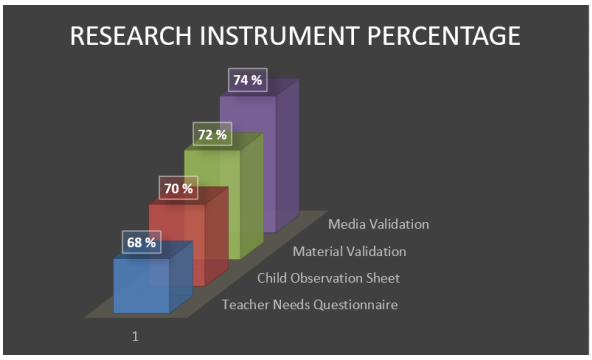

Figure 6. Validation Results of Material Experts, Media Experts, Child Observation, and Teacher Questionnaire Instruments

Based on Table 1, the validation and trial results of the research instruments show that the multimedia-based English learning media at ECE Ibunda Sayang has high feasibility. Here are the details:

Expert Validation The experts' assessments show a very positive response to the developed media.

> *The Media Expert gave a score of 4 with a percentage of 74%, which falls into the Very High category. This indicates that in terms of display, functionality, and interactivity, the media is highly suitable and attractive for early childhood.*
>
> *The Material Expert also gave a score of 4 with a percentage of 72%, which is in the Very High category. This proves that the learning content, such as vocabulary, pronunciation, and material flow, is accurate and appropriate for the developmental stage of ECE children.*

Field Trial The trial conducted directly in the field also yielded satisfying data.

> *The results of the Child Observation received a score of 4 with a percentage of 70%, which is categorized as Very Feasible. This number shows that children have very good engagement and response when using the media, such as enthusiasm, active participation, and understanding of instructions.*
>
> *From the Teacher Questionnaire, a score of 3 was obtained with a percentage of 68%, which also falls into the Very Feasible category. This indicates that the teachers consider this media to be very helpful and suitable for implementation in daily teaching and learning activities.*

Overall, the data from this table concludes that the developed learning media is highly feasible, effective, and well-received by experts, children, and teachers at ECE Ibunda Sayang.

Revision Stage

Based on the trial results, the media will be improved to enhance its quality.

Feedback Analysis:

> *Analyzing the data collected from the trial to identify the media's weaknesses. For example, are the instructions unclear, the animations too slow, or the sound not crisp enough?*

Product Improvement:

> *Making improvements and refinements to the media according to the analysis results. This could include design changes, the addition of interactive features, or content revisions.*

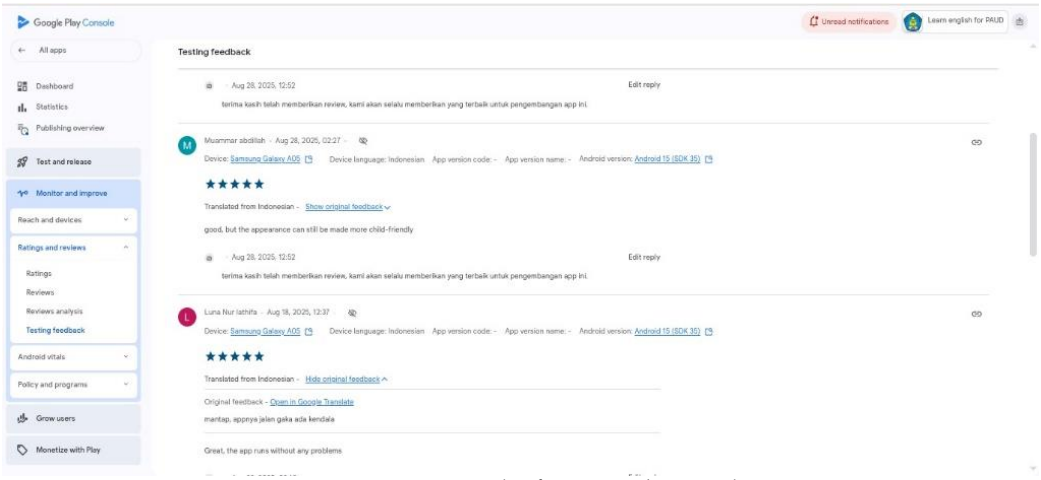

Figure 7. User Review Results from Media Quality Improvement

Dissemination Stage

The final stage where the media is ready for widespread use and its results are published.

Implementation:

Implementing the revised interactive media in all English classes at ECE Ibunda Sayang.

Providing training to teachers on how to use this media optimally in their daily activities.

Publication:

Publishing the research findings through an educational scientific journal to share the experience and findings with the wider educational community. The goal is for this media to be adopted by other ECEs facing similar challenges.

Based on the data collected from various research instruments, here are the specific findings regarding the children's responses to the developed English learning media.

Vocabulary and Pronunciation Improvement

The pre-test and post-test results showed a significant increase in the children's mastery of basic English vocabulary. This proves that the interactive media is effective in helping children learn new words.

According to the Material Expert validation, the media was rated as very good in supporting the improvement of basic vocabulary.

Motivation and Active Participation

Child observation results indicated that the majority of children (in the 'Very High' and 'High' categories) showed happy expressions, enthusiasm, and active participation while using the media.

They appeared interested, listened to instructions, and actively followed the activities within the media. This indicates that the media successfully increased the children's learning motivation.

Material and Language Mastery

The Material Expert validation showed that the vocabulary used was appropriate for the

children's developmental stage and that the media effectively supported vocabulary acquisition.

Nevertheless, a minor note was made that the narrative language and material repetition should be improved to be more easily understood by the children. This is an important input for the product revision phase.

Teacher's Response

The teacher questionnaire showed that teachers rated the media as 'Very Feasible' and felt that it was highly helpful because the children became more enthusiastic about learning.

Overall, these findings conclude that the interactive media is not only academically effective (inincreasing vocabulary) but also successfully created an enjoyable and participatory learning experience for the children.

CONCLUSIONS

This study successfully developed and validated a multimedia-based interactive English learning model for early childhood education. The research, conducted at ECE Ibunda Sayang, utilized the Research and Development (R&D) method following the Borg & Gall model, which included five systematic stages: Preliminary Research, Product Development, Product Validation, Product Trial, and Product Dissemination. The results from expert validation and field trials were highly positive. Both media and material experts rated the product as "Very High" (74% and 72% respectively), confirming its quality, suitability, and effectiveness. Likewise, child observations and teacher questionnaires indicated the media was "Very Feasible" (70% and 68% respectively). This demonstrated a high level of student engagement and strong teacher support. Overall, the developed interactive multimedia learning media is a highly effective, feasible, and well-received solution for enhancing English language skills in early childhood. Its success demonstrates the potential of technology to create an enjoyable and participatory learning experience for young children, helping them to better understand and master English.

REFERENCES

Afdhalina. (2022). The Effect of Reading Strategies and Learning Styles on The Students' Achievement in Reading Comprehension. Jurnal Scientia, 10(2), 172–186.

Creswell, J. W. , & C. V. L. P. (2017). Designing and Conducting Mixed Methods Research.

Dewi, W. A. F. (2020). Dampak Covid-19 Terhadap Implementasi Pembelajaran Daring Di Sekolah Dasa. Edukatif: Jurnal Ilmu Pendidikan, 2(1), 55–61.

Dhieni, N. (2020). Panduan Penegerian Satuan Pendidikan Anak Usia Dini. Kemendikbud RI.

Ginting, N. H. S., & Wahyuni, D. (2024). Implementasi Program Edukasi Gadget pada Anak Usia Dini Berbasis Multimedia di Sanggar Keadilan SMH-Indonesia. JIPITI: Jurnal Pengabdian Kepada Masyarakat, 1(2), 15–20.

Kurnia, R. (2022). Aplikasi Pembelajaran Bahasa Inggris Berbasis Multimedia Pada Sekolah Dasar Negeri Depok 01. 7(2).

Na'imah, N. (2022). Urgensi Bahasa Inggris Dikembangkan Sejak Anak Usia Dini. Jurnal Obsesi : Jurnal Pendidikan Anak Usia Dini, 6(4). https://doi.org/10.31004/obsesi.v6i4.1916

Pertiwi, A. B. , R. A. , H. R. (2021). Metode Pembelajaran Kosakata Bahasa Inggris Pada Anak Usia Dini. Jurnal Kumara Cendekia, 9(2), 95–106.

Putra, J. A. , N. E. A. , F. N. S. , W. (2024). Design and Develop Interactive Multimedia Applying Problem-Based Learning to Enhance Problem-Solving Skills. Bit-Tech, 6(3), 229–339.

Putu, N., Oktapiani, G., Asril, M., Gede, D., Wirabrata, F., Pendidikan, J., Anak, P., & Dini, U. (2021). Upaya Meningkatkan Kosakata Bahasa Inggris Pada Anak Usia Dini Dengan Media Wayang Melalui Video Pembelajaran. Jurnal Pendidikan Anak Usia Dini Undiksha, 9(2), 285–293. https://ejournal.undiksha.ac.id/index.php/JJECE/index

Schunk, D. H. (2012). Learning Theories, an Educational Perspective (6th ed). Boston, MA: Pearson Education Inc.

Susantini, N. L. P. (2021). Media Flashcard Berbasis Multimedia Interaktif untuk Pengenalan Kosakata Bahasa Inggris pada Anak Usia Dini. Jurnal Pendidikan Anak Usia Dini Undiksha, 9(3), 439–448.

Sutanto, H. & S. F. (2021). Pengembangan Media Pembelajaran Bahasa Inggris Berbasis Multimedia Interaktif untuk Anak Usia Dini. Jurnal Ilmiah Pendidikan Dan Teknologi, 10(4), 200–215.

Wahyuni, D. , S. R. (2020). Application of Acupressure Techniques for Breastfeeding Mothers Using Multimedia Based on Computer Assisted Learning (CAL). IMADe (International Conference on Multimedia, Architecture and Design), 497–503.