

## Development of Toupic (Touch Picture) Applications to Improve Expressive Language in Speech-Delayed Children

Mirawati Mirawati<sup>1</sup>, Ilahiah Rizkiatul<sup>2</sup>

<sup>1</sup> Universitas Lambung Mangkurat, Banjarmasin, Indonesia; [mirawati.plb@ulm.ac.id](mailto:mirawati.plb@ulm.ac.id)

<sup>2</sup> SLB Negeri 1 Martapura, Banjar Baru, Indonesia; [rizkiatulahiah72@gmail.com](mailto:rizkiatulahiah72@gmail.com)

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### ARTICLE INFO

#### Keywords:

Expressive Language;  
Speech Delay;  
Stimulation Media;  
Toupic (Touch Picture)  
Applications

#### Article history:

Received 2023-02-10

Revised 2023-03-08

Accepted 2023-08-30

### ABSTRACT

This study aims to develop a product in the form of a toupic (touch picture) application to help stimulate the increase of expressive language in children with speech delay. This type of research is Research and Development (R&D) using the ADDIE model (analysis, design, development, implementation, and evaluation). This research was conducted at SLB Negeri 1 Martapura, South Kalimantan. Data collection techniques using interviews, tests and questionnaires. interviews are used to get an overview of needs analysis data and product evaluation by users. The test is used to measure speech delay children's expressive language skills in the initial and final conditions after using the product. while the angle is used to measure the level of product validation by the validator. Qualitative data from interviews were analyzed descriptively while quantitative data from tests and questionnaires were analyzed using statistics with the formula  $P = (\sum R) / N \times 100\%$ . The development of the toupic application goes through several stages, namely: 1) the analysis stage as an initial research to determine the conditions and needs of children, 2) the design stage is carried out by compiling a conceptual framework for application development, 3) the development stage, namely developing an application framework by information and technology experts who then validated by experts with a validation percentage of 95% and declared very valid, 4) the implementation stage to test the toupic (touch picture) application on speech delay children with a result of 82%, and 5) the evaluation stage showed an increase in the expressive language skills of speech delay children. From the percentage of results before and after that is 52% to 82% indicates that the application does not require final revision anymore. Thus, it can be concluded that the development of the toupic application (touch picture) can improve the expressive language skills of children with speech delay.

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### Corresponding Author:

Mirawati Mirawati

Universitas Lambung Mangkurat; [mirawati.plb@ulm.ac.id](mailto:mirawati.plb@ulm.ac.id)

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## 1. INTRODUCTION

Special education is an educational unit capable of accommodating all students without exception. Special education is the implementation of education for students with disabilities or students who have extraordinary intelligence, which is carried out inclusively in schools in general or in the form of all special education at the primary and secondary education levels (Amka, 2020). Of course, the orientation of special education itself must also be in accordance with the abilities of students (Mirnawati, 2020). Through this, students are expected to achieve their respective abilities. In this special education environment, of course, there are also children who have various kinds of obstacles, one of which is speech-delayed children or commonly referred to as speech delays. Speech delay is a condition in which early childhood experiences a delay in the process of speaking compared to the speech process of children of their age.

Children with speech delay experience delays in the speaking process compared to the speech processes of children of their age. Children with speech delays will show limitations in articulation, sound, fluency and completeness of letter arrangement (Husna & Eliza, 2021; Alfin & Pangastuti, 2020). Speech delay can also be interpreted as showing a tendency when children have difficulty expressing desires or feelings through words, cannot speak clearly, and have a limited vocabulary (Aisyah et al., 2022; Sunderajan & Kanhere, 2019). Speech delays that parents often complain about are that their children cannot speak yet or do not understand the meaning of the words conveyed by parents.

The main problems faced by speech delay children are difficulties in expression, difficulty in producing words, difficulty expressing thoughts. This condition is also known as expressive language (Taqiyah & Mumpuniarti, 2022; Stock & Fisher, 2006). Expressive language is the ability to convey or express what desires, feelings, ideas, gestures and thoughts are inside that will be conveyed to others. Decree of the Minister of Education and Culture of the Republic of Indonesia No. 146 of 2014 concerning the 2013 Early Childhood Education Curriculum states that expressive language for children aged 5-6 years begins to express their desires, feelings and emotions when communicating in simple sentences. The problem in expressive language is where the child has difficulty expressing himself in speaking/communicating. The child seems to want to communicate, but it is very difficult to find the right words, the words mastered by the child are forgotten and the use of grammatical structures is very below the level of his age (Jullien, 2021; Merdiasari et al (2017). Expressive language skills appear in the form of speaking and writing abilities. The main ability to be developed at an early age is the ability to speak. Expressive language or expressing language for children means not only making sounds or sounds but how children express their desires, needs, thoughts and feelings to others by means of speech.

As the results of the initial field study at SLB Negeri 1 Martapura, researchers found a speech delay barrier child aged 8 years, and the child had no other accompanying obstacles, the child had no hearing loss or even a behavioral barrier. Thus, the child with a speech delay in this study was classified in the functional speech delay category, namely, speech delay caused by a lack of stimulus. The limitations that exist in children are visible difficulties in responding to other people's speech, children having difficulty expressing what they think, and expressive speech with unclear articulation so that children cannot clearly express what they want. However, children can understand an order or a word; it's just that they have difficulty reciprocating in a conversation or communicating with people around them both at school and at home.

Expressive language problems in speech-delayed children will certainly have an impact on various aspects of a child's life. Speech-delayed children will certainly experience problems in learning activities in class, it is difficult to establish mutual interaction in learning activities and in social interaction with the surrounding environment, these limitations will certainly also have an impact on the social and emotional condition of speech delay children. Children with speech delay will lose the opportunity to be involved in social activities with their peers. Expressive language delays can cause problems such as difficulties in early literacy, school achievement, behavior, and relationships with friends and family. Children who experience delays can also pose a risk of being ridiculed by others (Suryana & Nilawati, 2012; Stock & Fisher, 2006). Thus, the problem of limited expressive language development in children with speech

delay needs attention and intervention efforts. According to (Anggalia & Karmila, 2014) that spurring children's speaking ability is something important.

Nevertheless, the initial study's results indicate that parents were preoccupied and unable to provide significant attention to their children with speech difficulties in their household. Consequently, the children mostly engaged in interactions with each other via mobile phone games, with minimal oversight or assistance from their parents. Conversely, educational curricula typically prioritise academic subjects and do not include specific measures to assist individuals with speech impediments in enhancing their ability to express themselves verbally. Conversely, educators promote student engagement by integrating question and answer sessions into academic instruction.

Providing stimulation or stimulation of expressive language development in children needs to be adjusted to the times (Mardhiyanida, 2019). Along with the development of the times, the development of technology is now increasingly sophisticated. One of the real forms of technological development is gadgets. Gadgets are now a basic human need because they can make it easier for humans to carry out daily activities such as getting information, communicating with other people in various places, capturing images, recording images, storing documents, playing games, and so on. Gadget users are not only adults; children can also operate gadgets. With intensive parental assistance, providing stimulation regarding the introduction of gadgets to children can stimulate the development of children's expressive language.

Previous research conducted by (Mardhiyanida, 2019) used the SNOW application to improve children's expressive language where in this application children can adjust their expressions with the stickers or filters they choose. The SNOW application is an application that is built into the gadget and is used to take pictures or videos with various effects and stickers. However, this application still has several weaknesses, namely it does not provide stimulation of vocabulary and pronunciation of words to children, expressive language that is developed is more towards non-verbal expressive language, while in speech delay children expressive language skills that are important to develop are the ability to speak with different pronunciations. Good. Thus, this study aims to develop a product in the form of toupic applications (touch images) to improve children's expressive language in children with special needs with speech delays. Applications that operate offline using Android, display in the form of animation, with voice and video features for pronouncing each noun, which are equipped with guidelines for use and assistance by parents.

## 2. METHODS

This type of research is in the form of Research and Development (R&D), which uses the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). This research was conducted at SLB Negeri 1 Martapura, South Kalimantan. The subjects in this study were children with speech delays. The stages of development research with the ADDIE model are described as follows:

### 2.1 Analysis

The analysis phase is carried out through needs analysis and performance analysis activities. Performance analysis is to find out and clarify whether the problem of expressive language barriers for speech delay children requires a solution in the form of product development in the form of a toupic application. The data collection technique used in the analysis phase used interviews with teachers and parents, the data were analyzed descriptively. needs analysis, namely to determine the abilities or competencies that speech delay children need to learn to improve their expressive language skills, thus a test of expressive language skills is carried out on speech delay children using a test sheet to see the initial expressive language abilities of speech delayed children, the data is analyzed using descriptive statistic  $P = (\sum R) / N \times 100\%$ .

## 2.1 Design

The design stage is carried out by compiling a product design for the toupic application to be developed, the product design is still conceptual and will form the basis for the development process at a later stage. there are several designs that are prepared including determining the learning experience, learning objectives, material, appearance and features in the application.

## 2.2 Development

In the development stage, the conceptual framework is realized into a product that is ready to be implemented. Toupic application product development is carried out in collaboration with partners in the field of information technology who have competence in application development. The application that has been developed is then validated by experts. expert validation data collection techniques are carried out through questionnaires, with descriptive statistical analysis with the following validity criteria.

**Table 1.** Criteria for Validity

Achievement level (%)	Qualification	Description
81 – 100 %	Very good	Very valid/no need for revision
61 – 80 %	Good	Valid / no need for revision
41 – 60 %	Enough	Less valid / need revision
21 – 40 %	Not good	Invalid/ need revision
< 20 %	Very less	Very invalid / need revision

## 2.3 Implementation

At this stage, the product has been developed and declared valid by the validator, and then the product is implemented in real situations in speech delay children.

## 2.4 Evaluation

Evaluation at this stage will get input from users regarding features, usage, language, the usefulness of the toupic application product, input from users will be followed up in product improvements which are carried out through interviews with users. In addition, a test of expressive language skills was also carried out for speech delay children using a test sheet to see whether there was an increase in expressive language skills for speech delay children. The data were analyzed using descriptive statistics  $P = (\sum R) / N \times 100\%$

## 3. FINDINGS AND DISCUSSION

### 3.1. Findings

#### 3.1.1 Analysis

Based on the results of an initial field study conducted at SLB Negeri 1 Martapura with observations and interviews conducted with teachers, the problems that exist at school are classified as related to the obstacles that speech delay children have in grade II including articulation difficulties so that children cannot clearly express their wishes. The score of the test results through practice and filling out the test sheet containing the pronunciation of 26 nouns alphabetically shows a percentage of 52%, the following table shows the results before the trial.

**Table 2.** Preliminary data on expressive language skills of speech delay children (pretest)

Max Score	Score obtained	Percentage
104	54	52%

Another thing is that schools do not have supporting tools or media for speech delay children in improving their expressive language. The analysis of the field conditions requires tools to improve the expressive language of speech-delayed children. Thus, researchers have developed an Android-based application development product that is integrative with sound, text, and images so that it is more interesting and varied.

### 3.1.2 Design

Product design for application development by designing a conceptual design, first related to the appearance of the opening intro, namely the cover which contains the words "Tou-Pic" with animated images, the dominant color is yellow-green. Contains a menu consisting of Start, Tutorial, and About Application. Next, format the content by adding a picture and sound description for each noun. The design of the application involves IT experts agreeing on the appropriate content or the contents of detailed statements to improve the expressive language of class II speech delay children at SLB Negeri 1 Martapura.



**Figure 1.** view of the touch-pic application

### 3.1.3 Development

The development of the resulting application from the design that has been conceptualized is left to Information and Technology experts to develop it. Furthermore, after the product has been successfully developed, namely by conducting an application feasibility test by means of application validation. Validation is carried out by an expert validator by looking at the quality of the application which consists of the feasibility of the content, language, display and use as a tool to improve the expressive language skills of speech delay children. The development of Android-based toupic (touch picture) applications in this study was validated by 3 experts, and resulted in several revisions as follows:

1. The addition of image features that appear in the application is intended to make the image larger so that it looks clearer and matches the sound and the image that appears.

2. Substitution of pictures in nouns, intended for simpler vocabulary. Some of the pictures were replaced, namely the noun feature "ember" was replaced with an "elang" and the noun feature "figura" was replaced with a "fery"
3. The change of noun name through sound is in the noun which was "Al-Qur'an" before being revised after being revised to "Qur'an", intended to conform to the letter of the alphabet Q.
4. The addition of descriptions to picture nouns through sound on all picture nouns, is intended to make it easier for children to know the meaning of the noun pictures displayed.

After revisions were made based on suggestions and comments, the validator gave an assessment on the feasibility aspects of content, language, appearance and use. Here are the results of the three validations:

**Table 3.** Results of expert validation by validators

	Assessment Aspects			Total
	Content Eligibility	Language	Display and Usage	
Score Earned	497	28	30	613
Max Score	525	30	90	645
Percentage	94%	93%	97%	95%
Category	Very worth it	Very worth it	Very worth it	Very worth it

Based on the results of the validation of the three experts, an assessment of 3 aspects was obtained, namely the content feasibility aspect of 94% which was included in the "very worth it" qualification, the language aspect of 93% which was included in the "very worth it" qualification, and the display and use aspect of 97% are in the "very worth it" category. Then the total of all android-based toupic (touch picture) application assessments from the three obtained a presentation of 95% with the description "Very worth it /very valid" this shows that the android-based toupic (touch picture) application has been developed as an application to improve expressive language speech delay in children meets the validity criteria to be tested on children. There are a number of comments and suggestions from the validators for improvements to the application with the aim of making the android toupic (touch picture) based application that has been developed better. Then, the next step after the revision is done is to implement the application product for speech delay children.

### 3.1.4 Implementation

The steps are carried out after fulfilling the eligibility or validity of the validator. Implementation of the toupic (touch picture) application for speech delay children, namely an application aimed at children by touching each part of the pictorial table which will bring up a description sound from the image touched, the child follows each noun description repeatedly sound from "Apel" to the object image "Zebra" and performed using flash cards. At the time of the child's implementation of the speech delay condition as follows:

1. The condition of the child looks enthusiastic and curious when given an initial explanation regarding the contents in the application. This is because toupic (touch picture) applications like this are new for children.
2. The conditions during the trial for speech delay were that children paid attention to the explanation regarding the procedures for using the application and wanted to follow instructions from start to finish.
3. Test Results Expressive language skills after the trial are seen based on the table below.

**Table 4.** Data on expressive language skills of speech delay children through the use of the toupic application (posttest)

Max Score	Score obtained	Percentage
104	85	82%

Based on the table above it is known that children have a percentage of 82% with expressive abilities shown using flash cards. With a very high score of 4 there are 12 nouns "bola, cabe, domba, jam, lemari, nanas, obat, sepeda, topi, uang, vas dan yoyo". With a score of 3 there are 11 nouns "apel, elang, fery, garpu, handuk ikan, kucing pesawat, qur'an, rambut dan wortel". Score 2 is 1 noun "zebra", score 1 has 2 nouns "madu dan xylophone" and there is no score of 0.

### 3.1.5 Evaluation

Based on the evaluation results obtained from the teacher and children at the implementation stage, it is known that the teacher from the homeroom teacher for class II B gave an assessment by submitting comments about the toupic application (touch picture) that this application was very good because the teacher felt that researchers cared about the child's condition, and the application helped teachers in school as one of the media tools to help improve children's expressive language skills. The evaluation results obtained based on the results of the expressive language test sheet showed an increase in percentage. Thus this product does not require further revision.

**Table 5.** Data on improving the expressive language skills of children with speech delay

	Max Score	Score obtained	Percentage
Pretest	104	54	52%
Posttest	104	85	82%

### 3.2 Discussion

The development of toupic (touch picture) applications to improve the expressive language skills of speech delayed children has several procedures and influences from the application itself. Development procedures namely analysis, design, development, implementation and evaluation which are known that the application has a good influence on improving children's expressive language skills.

Children with speech delays sometimes struggle with articulation, delayed speaking, lack of vocabulary, and expressing themselves clearly, all of which highlight the need for application development in this area. Regarding expressive language, Istiqlal (2021) states that children with speech delays have problems with both accurate and imprecise pronunciation, rigid lip motions, and the production of low sounds. In addition, children with speech delays do not yet have access to any learning materials tailored specifically to their needs. As a result, the researchers created a medium for youngsters with speech delays—an app.

Android-based interactive media applications developed to keep up with increasingly sophisticated times with many people using electronic devices are no exception to the subject of research. The product developed is in accordance with the ADDIE development model procedure by Sugiyono (2015), which includes analysis, design, development, and evaluation.

The initial stage of development involves doing an analysis based on the findings of the initial field research. It is important to consider the conditions of children's obstacles and their demands. One of the things that children enjoy is illustrated cartoons, especially those accessible through technological devices such as mobile phones. Evidence gathered from observations and interviews conducted at school indicates that the child's articulation is indistinct, rendering him unable to communicate his desires effectively. In connection with this, the Minister of Education and Culture (2014) asserts that a

kid is considered to possess expressive language skills if they are able to communicate using both verbal and nonverbal means. This aligns with Susanti's (2018) viewpoint that expressive language skills are interconnected with children's proficiency in verbal communication, encompassing facial expressions, intonation, and gestures that contribute to effective language expression. However, the youngsters in the research study did not demonstrate proficient expressive language abilities that align with their age-appropriate developmental milestones.

Furthermore, it is well-established that schools do not offer specific resources for children with speech delays, in addition to the findings from observations and interviews on children's expressive language abilities. Contrary to Sutanto's (2017) viewpoint, the utilisation of interactive multimedia is seen essential for enhancing the stimulation process and capturing the attention of speech-delayed youngsters, according to Sutanto. Considering the field conditions and expert opinions, the product has been built as an android-based application that seamlessly combines image, text, sound, and animation displays. The programme is designed to be user-friendly and visually appealing.

Additionally, the next step involves developing an Android application centred around touch picture technology. The application comprises multiple components, including an initial page labelled "Tou-Pic" with three primary menus: start, tutorial, and about the application. Next, complete the two primary menus by first entering the menu's contents, which include a picture table illustrating 26 nouns aimed at enhancing the expressive language skills of children with speech delay. In accordance with the findings of Poernomo et al.'s (2016) study, multimedia applications that involve manipulating phones can be utilised as a means of support in training and enhancing the letter and word recognition and pronunciation skills of youngsters with speech delays.

The design of this product is based on subject S, who is 8 years old and likes pictures, so that the applications with pictures and bright color backgrounds are dominated by green, yellow and blue. The fill format is also filled with a sound description of the image to be touched. Design based on the background needs or preferences of children to support the application. This is related to the research results of Gusmita (2018) and Nurhanifah (2022) that the use of color image media has a positive impact on stimulus because it is more fun and influences children's active involvement in knowledge and learning experiences.

The third stage is product development that has been designed by researchers and then handed over to a team of IT experts to develop finished product applications. The application for this product is based on Android to make it easier to use. After the initial product has been developed, validation is then carried out by experts to determine the feasibility of the product, which includes an assessment of the feasibility of the content, language aspects, and aspects of appearance and use. This agrees with Firdaus' research (2019) in which his research held validation stages which were carried out as material for consideration and further development of a product to be repaired, without repairs or to be completely overhauled by looking at the media and content aspects.

Furthermore, the fourth stage is implementing the toupic application (touch picture) with product trials. Based on the overall results of the trials on children, it was very good that there was an effect from the application on the results of the test sheet. The percentage before the trial was 52% and after the application trial, was 82%. This is similar to the results of research conducted by Mukhtar, et al (2019) which showed that the design of an expressive language learning system in the developed application can assist speech therapists in teaching people with Asperger's syndrome in learning expressive language and assembling words with usability that meets good criteria standards. At the testing stage, the usability results were "Good" with an average of 80.9%. Some features that might be very helpful in the future if added are the recording feature and adding new verbs to add to the existing vocabulary in the application, so the therapist can continue to add words according to the needs of the speech therapy activities being carried out, as well as improvements to the merging transition. audio to be smoothed out in order to create smoother sentences.

Then the final stage is product evaluation which is based on the results of the teacher's and speech delay child's responses to the application. Researchers know that the application is very valid to use

based on validation and teacher responses that the application developed is very feasible to use and helps the school. The results from the children during the trial showed very good results. The children were enthusiastic and curious, paid attention to explanations about how to use the application, and wanted to follow instructions from start to finish. Thus, based on the results that have been described, the toupic (touch picture) application does not require final revision and is very suitable for use to improve the expressive language skills of speech delay children.

The toupic application product (touch picture) after being implemented shows the effect of increasing the expressive language of speech-delayed children. The toupic (touch picture) application is designed with audio visuals to attract children's attention. In line with the results of research by Ramadania, et al. (2020) that audio-visual media has a significant effect on the learning outcomes of children with special needs with autism, because audio-visual media is not only verbal media that keeps children interested. As in this study, the use of applications in the form of android-based audio-visual for speech delay children makes abstract things more concrete so that it helps children increase their motivation and increase expressive language. This research is limited to knowing the pre-trial and post-trial tests using the ADDIE stage but has not carried out further calculations using data analysis and does not have dissemination or dissemination stages only up to evaluation.

#### 4. CONCLUSION

Based on the results of the research and development, it can be concluded that the process of developing toupic (touch picture) applications in improving the expressive language of speech delay children uses the ADDIE model with analysis, design, development, implementation, and evaluation. So, the stages in the analysis with initial field research to find out their needs and interests. At the design stage in the form of compiling an interactive application framework. The development stage is the stage for developing the application assisted by IT experts who have been designed, and then the application is validated by a validator expert who has several revisions such as adding image features, changing images, changing names and adding descriptions. Obtained with an overall validation of 95% is very valid. The stage for testing the application to children with the implementation test sheet shows that it has an effect with a percentage before the trial of 52% and after the trial of 82%. The final stage is the evaluation stage which is carried out after implementation. At this stage, it is based on the teacher's assessment that it does not require further revision. All stages are used without exception. The influence of the application obtained from the results of the trial test sheet for children shows that expressive language skills have increased based on the results of the test sheet count which shows that before the trial it was 52% and after the trial, it was 82% so based on this percentage it has an increase. The limitations in this study are that the vocabulary contained in the application is still limited to the vocabulary of surrounding nouns. Thus, future research is expected to be able to develop similar applications by including a complete vocabulary including nouns, verbs, and adjectives that can be used as a learning medium to develop expressive language for children with special needs.

**Acknowledgments:** Thanks to the principal and all teachers at SLB Negeri 1 Martapura for administrative support and assistance in product implementation at school.

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