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Development of "Avic"Application as a Basic Level Communication for Autism Students

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ABSTRACT

Autism is a neurological disorder during development that results in a child having barriers, one of which is communication barriers, so that they require special guidance and services. An autistic person is also a visual learner, they receive information more easily visually than verbally or otherwise. Assistive technology has been widely used as a tool to help children with special needs, including autism. The Research use a TEACCH Method of PECS stage 1 until 3. Research and development of this application uses the RnD model (in Sugiyono) which consists of 10 stages, and researchers only took 9 stages, namely (1) Potential and Problems, (2) Data Collection, (3) Product Design, (4) Design Validation , (5) Design Revision, (6) Product Trial (7) Product Revision (8) Usage Trial (9) Potential and problems. The validation subjects in this research were material experts, media experts and practitioners. The validation technique uses Aiken V. The data analysis technique uses non-parametric tests, quantitative percentage techniques, descriptive techniques for qualitative data. The results of the analysis produced application validation results with an average above 0.8, which means it is very feasible, and there is an increase in value when using the application by autistic students with basic communication

INTRODUCTION

According to J.A. Devito (Damayani, 2021:2) communication is an action by one or more people who send and receive messages that are distorted by interference that occurs in one context, has influence and there is an opportunity for feedback. Communication also has several obstacles, especially for autistic children. According to Kauffman and Hallahan (2011) Autism is a comprehensive disorder that results in obstacles in communication, social and behavioral abilities.

From the explanation above, the obstacles for autistic children are obstacles in communicating. Communication barriers in autistic children are a problem that can hinder humans' role as social creatures. Autistic children have a unique communication development profile, some of them can use verbal communication as a way of communicating, and even non-verbal.

Communication tools with visual support really help autistic children in communicating, because autistic people are visual learners. This visual support is very helpful for autistic children's communication, especially for those who use nonverbal language. Delivery using visual support can help them understand orders from other people, especially expressing their wishes.

Communication aids using visual support are an alternative that has been used in the TEACCH method or Treatment and Education of Autistic and Relate Communication-Handicapped Children. There are various stages in the structured teaching method in the TEACCH method, one of which is using the PECS method or Picture Exchange Communication System, which has several stages in it according to the abilities of autistic children.

Most of the autistic children who use non-verbal language are children with low functioning, or those who have an IQ < 70. Autistic children have difficulty in interpreting language, both receptive and expressive language, therefore in the early stages of PECS, namely in PECS Stage 1 will teach you the use of expressive and receptive language using one picture. If you are able, it will be developed in PECS stages 2, 3a and 3b1 up to the communication board.

Currently providing images for PECS phase 1 communications is done conventionally. If this is done using conventional methods, such as printing, it requires a lot of paper, entering images one by one and editing. This will consume a lot of energy and materials and is not environmentally friendly, because there is a lot of paper and plastic laminating waste if the visuals are no longer suitable for use. Conventional methods can be transferred to digital methods, namely via smart phones.

Learning phase PECS 1-3b1 requires a lot of images, especially of functional surrounding objects. Using this application really helps teachers and parents in looking for children's wishes or carrying out commands that children have just learned. For example, a child really likes a new cake, or a new toy. By using this application, teachers or parents can directly photograph the objects that students want while teaching them the names of the objects they like. You don't have to wait to photograph, edit and print first. Can use HP effectively and efficiently.

The systematic writing in this development research is divided into six chapters, each chapter has its own sub-chapter.

METHODS

This research was conducted at SLB River Kids Malang using the research and development (RnD) method. Sugiyono (2015:297) states that research and development (RnD) is a research method used to produce certain processes and test the effectiveness of the product. The product resulting from this research is media in the form of an application for communication using the PECS method stages 1 and 2 for elementary level ASD students.

According to Sugiyono (2015:297), steps for using research and development. There are 10 steps in using research according to Sugiyono but, researchers only took 9 stages, namely (1) Potential and Problems, (2) Data Collection, (3) Product Design, (4) Design Validation, (5) Design Revision, (6) Product Trial (7) Product Revision (8) Usage Trial (9) Potential and problems.

The procedures carried out in this development research include several stages as stated by Sugiyono (2012: 409). The initial step in this stage is analyzing needs to find out potential and problems as well as appropriate solutions such as (1) analysis of student needs (2) data collection (3) product design, (4) design validation, (5) design revision, (6) product trials (7), product revisions, (8) and product trials.

The data used in this research are qualitative and quantitative data. In accordance with development research needs, quantitative reports are combined with qualitative. Qualitative data is in the form of input, responses, criticism and suggestions through open questionnaire questions, while quantitative data is collected using closed questionnaire questions in the form of answer choices on a Likert scale, which are prepared by providing answer choices regarding product assessment and tests of achievement results before and after treatment.

The research instruments used to obtain data from this research are questionnaires and tests. Questionnaires are used to collect data on assessment results from material experts, media experts and learning media experts.

This research obtained results in the form of a Validity coefficient table with Aiken's V calculations based on the results of a panel of n people's assessment of an item regarding the extent to which the item represents the construct. The Aiken's V test is formulated by:

$$V = \frac{\sum S}{n(c-1)}$$

The test used to measure data is not normally distributed or the amount of data tested is small, and the data level is nominal or ordinal. The data in this study contain 5 samples that will be tested. So the non-parametric test used is the Friedman non-parametric test. Because the treatment given to the object is more than 2 times and is interconnected.

$$\mathrm{Fr} = \left[\frac{12}{Nk(k+1)}\sum_{j}^{k} = 1\left(\mathrm{R_j}\right)^2\right] - \{3\mathrm{N}\ (\mathrm{k}+1)\}$$

Information :

k = Number of categories tested

N = Number of individuals tested

R_J =Number of devices in the jth column

Hypothesis:

H_0: There is no increase in receptive and expressive communication between before and after using the "ÄVIC" communication application

H_1: There is an increase in receptive and expressive communication between before and after using the "ÄVIC" communication application

RESULTS AND DISCUSSION

Results

In this chapter, development results will be discussed including, (A) Development results, (B) Presentation of validation data, and (C) Presentation of trial data. Development of learning media in the form of the "AVIC" communication application which uses 6 development steps adapted based on the Borg and Gall research and development method in Sugiyono (2012).

Based on the results of observations of the learning process of basic autistic students at the PECS 1-3b1 stage and interviews with River Kids Malang Autism SLB class teachers who are currently in the process of learning PECS 1, PECS 2, PECS 3 and 3b1 communication, it is known that mildly autistic children have several stages of communication , students are able to communicate through the basic stages to the final stage of communication, namely conversation. However, in the learning process, children with basic autism who are in the severe category experience communication problems such as difficulty focusing on what they are learning.

Data collection was carried out for planning the design of the "AVIC" communication application product in the form of analyzing the curriculum, conducting literature studies regarding student characteristics, communication applications, as well as analyzing research studies relevant to communication applications for basic autistic children, found in curriculum analysis, basic competencies, study analysis Libraries, Product

Design, Material preparation, product manufacturing process, and application design results.

In studying, students can learn according to the level of student communication skills according to the student's PECS level. Teachers can provide learning from students' daily activities.

The teacher carries out learning stages such as PECS using plain paper visuals. During sensory activities, students are given smartphones. For students who are at Level 1 or PECS stages 1 and 2, use the PECS stages as usual, the only difference is that in conventional PECS, learning uses exchanging images for objects that students want, but in this application students press the image in the application and will get what they want. what he wants.

In this chapter, data is presented from the results of material expert validation by validators consisting of 2 validators who have a background as part of the SLB curriculum, 1 media expert validator from a media developer in the IT field, 1 validator, namely a teacher who has been caring for elementary autistic children for at least 2 years, each validator has good competence in their field, and the last one is the results of the pre-test post-test in the product trial process from 5 basic autistic students with communication levels PECS 1, PECS 2, PECS 3a and 3b1.

From these three experts, their validity can be tested using the Aiken's V validity test

Validation Test Testing using Aiken V:

$$V = \frac{\sum S}{n(c-1)}$$

S=e-lo

r= the number given by the assessor

lo: low validity assessment figures

n= number of assessors

c= highest validity assessment number

Validity Criteria:

0.8-1 = Very high validity

0.6-0.79 = High validity

0.40-0.59 = Medium validity

0.20-0.39 = Low validity

0.0-0.19 = Very low validity

It was found in the research that the average value was above 0.8. The lowest value obtained was 0.833333, and the highest value obtained was 0.916667. The conclusion from the validation results is that validity is very high.

Students get 1 pretest opportunity and 5 opportunities to give and posttest.

To find out whether there is an effect of a treatment carried out on the research object, researchers use a non-parametric test with a significant level using the average ranking of the pre-test post-test data that has been carried out. In presenting non-parametric test data, the post-test data used is the results of the fifth post-test as the final post-test and is the peak achievement of the test results carried out by students.

Step 1:

Make H_a and H_0 in sentence form

H_a: There is a significant difference in the learning outcomes of basic autistic students at Autism River Kids Malang SLB between before and after using the AVIC communication application.

H_0: There is no significant difference in the learning outcomes of elementary autistic students at SLB Autism River Kids between before and after using the multimedia shopping game.

Step 2: Create H_a and H_0 in statistical form

H_a : $\mu_1 \neq \mu_2$ (different)

H_a : $\mu_1 = \mu_2$ (not different)

Discussion

Development research is a process of observing and developing a product carried out by a researcher in a systematic way which aims to formulate a problem discovered by the researcher and solve the problem with a product that has been developed which is carried out scientifically. In this development research, the product produced is an application that is presented by providing PECS

communication material using the TEACCH method.

The application entitled "Autism Visual Communication (AVIC)" is the final result of the development of a communication application whose development process was carried out using the research and development method developed by Sugiyono (2015). As for the development procedure, researchers used 6 development steps including potential and problems, data collection, product design, design validation, design revision and testing.

Research and development can start from potential and problems (Sugiyono, 2015). Potentials and problems were obtained from observations of basic autistic students whose communication learning stages were at PECS 1, PECS 2, PECS 3a and 3b1 at SLB River Kids Malang. Researchers carry out observations using participant observation, namely the researcher is only an independent actor (Sugiyono, 2015).

When collecting response data using interviews, researchers used the Guttman assessment scale, namely "yes" and "no" in selecting answers to each instrument item (Sugiyono, 2015). This scale was chosen to make it easier for teachers to answer and avoid feelings of doubt so that they get a firm answer in accordance with the opinion of Sugiyono (2015) that using the Guttman scale is done if you want to get a firm answer to a problem being asked. The following is the explanation: In the aspect of ease of obtaining media, the accompanying teacher was asked the question "Can the AVIC communication application be obtained easily?". The teacher's response stated that yes, the AVIC communication application can be obtained easily on the smartphones owned by teachers and students because it can be downloaded on Playstore.

In the media implementation aspect, the teacher was asked the question "Does the use of AVIC communication applications such as navigation buttons and answer buttons run smoothly?" The teacher's response stated that yes, the navigation buttons and answer buttons on the AVIC communication application had no problems and ran smoothly.

In the aspect of media being able to provide motivation, the teacher was asked the question "In your opinion, are you motivated to learn by using the AVIC communication application?" The teacher's response stated that yes, using the AVIC communication application gave students enthusiasm for learning.

In the aspect of image clarity, the teacher is asked the question "can the images on the media be seen clearly? "The teacher's response stated that yes, the pictures were clear and easy for students to understand.

In the aspect of clarity regarding the features in providing the application, is it clear? The teacher's response was quite clear and helped the teacher in learning student communication effectively and efficiently.

In the aspect of media use, teachers were asked the question whether teachers felt it was easier to teach communication using media? The teacher's response stated that yes, it would be more helpful for teachers to teach basic communication to students through this communication application.

In the aspect of clarity of audio use, the teacher is asked the question: does the audio sound on the media sound clear? the teacher's response stated that yes, the sound was heard clearly

In the aspect of student interest, the teacher is asked the question whether students like using media? The teacher's response stated that yes, students were very happy in using media

In the aspect of students' understanding after using media, the teacher is asked whether students understand and are able to understand basic communication material after using media? The teacher's response stated that yes, by using media students become capable of expressive and receptive language communication material.

Based on the responses of classroom teachers for basic autistic students, it can be concluded that the AVIC communication application makes it easy to help students learn about basic communication learning and enjoy the AVIC communication

application with smooth navigation buttons, clear audio, clear questions or instructions, clear images, easy to install and increases student motivation to learn the material

CONCLUSION

AVIC's communication application products received appropriate criteria from media experts, material experts and class teachers, each of whom gave an assessment, namely the media expert received 4.9 with very appropriate information, the material expert 4.3 with very appropriate information and the learning teacher 4.7 with very appropriate information so that with this feasibility it can be concluded that the AVIC communication application is very suitable for use as basic autism learning media.

The AVIC communication application product obtained effective criteria from student learning outcomes, namely the posttest with an average acquisition of 689 and from the results of hypothesis testing with the acquisition of H_a, it was accepted with the statement that there was a significant difference in the basic communication abilities of basic autistic students between before and after using the AVIC communication application, so that It can be concluded that the AVIC communication application is effective in improving basic communication understanding of expressive and receptive language for autistic students.

Suggestion from reasercher In teaching basic autism, it is easier to manage applications so that students with basic autism can truly be independent in applying applications to support student independence, so that applications can be used functionally in everyday life.

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