

# Development of Three Dimensional Media for Mentally Retarded Children

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**Abstract:** This study aims to produce three-dimensional media for number and color abilities for mentally retarded elementary school children at special school Tunas Kasih Surabaya. Three dimensionals media to help mentally retarded children recognize numbers and colors. This is based on the research background of mentally retarded children at special school Tunas Kasih Surabaya who have difficulty learning to recognize numbers. So that the impact on children's learning outcomes is low. For this reason, it is necessary to solve the problem using the three dimensionals media that has a visual advantage. The development model used is ADDIE with stages of analyzing, design, develop, implement, and evaluate. The type of research used is non-parametric research. The method of data collection is done by open questionnaires, expert judgment, and tests. Test results were analyzed using expert judgment and the Wilcoxon match pairs test formula. The results show that, validating the feasibility of the three dimensionals media with excellent criteria. The use of three dimensionals media is effectively used for learning mentally retarded children compared to using conventional learning in the material of number and color recognition abilities for mentally retarded children.

**Keywords:** development, three dimension media, mentally retarded mental

## I. INTRODUCTION

In general, children with special needs have a broader spectrum than in normal children. Special needs children are children who are a permanent result of certain disability at the time of conception and also special needs children there are temporary. As for children with special needs a temporary need to get special handling in order not to be permanent [1]. Can also children with special needs are children who were traumatized by the disaster or unrest, trouble concentrating because they are often given a rough attitude at the time of the interaction of the environment.

According to [2] main characteristics of children with intellectual challenges are weak in thinking and reasoning lead to learning and social adaptation is below average. So the need for media to convey the message to the children during the learning process.

States that the instructional media as "the physical means of conveying to the instructional content books, films, videotapes, etc" [3]. Furthermore, [4] media states are "a tool to provide incentives for the students so that learning occurs".

According to [5], instructional media is anything that can convey the message that learning targets can be achieved. According to [6], instructional media are all objects or objects that can be used to convey a message, to provide a good stimulation to student's attention, interest or curious feeling when learning takes place. According to [7], learning media is anything that can be used to channel

the message, so it can stimulate the attention, interest, thoughts, and feelings of students in learning activities to achieve learning objectives. According to [5], learning media is anything that can be used to channel the message to Achieve learning objectives. [8] the National Education Association (2010) defines that media education is the entire spectrum of the object or objects that can be viewed, manipulated, read, heard or discussed along with the instruments used during the activity.

Following the interview on September 17, 2018, conducted in SLB Tunas Kasih Surabaya 1st grade children who amounted to 6 to get on the observation that on average they have not been able to write the numbers but was able to read it and they always have a value below (Criterion Conditions Minimal) 70. This learning problem can hinder the achievement of learning objectives. Thus the need for the media to be able to overcome these problems [9].

Based on the above problems, the need for a media that can help the learning difficulties in teaching students to be optimal. Media selection is tailored to the characteristics of children with mental retardation taxonomic adjusted according to the breast in [10] is a media game Three dimensional media can be classified into non-verbal visual media three-dimensional this is because of the real form of direct experience in an object. Media is meant here that the learner can recognize the form of numbers using real shapes and colors that can help him in know numbers.

Based on the explanation above, the title of the study is a “Development Of Media Three dimensional media Material Capability Introduction Numbers And Colors For Mild Mentally Retarded Children In Class 1 SD At SLB Tunas Kasih Surabaya”. This study aimed to determine the feasibility and effectiveness of the media Three dimensional mediawhich is used in the material number and color recognition abilities in children in 1st grade, mild mental retardation in SLB Tunas Kasih Surabaya.

## II. METHOD

The model of development used in the development of media Three dimensional media is the ADDIE development model by [11]. There are five stages in the development model. process stages ADDIE development model by [11] are as follows:

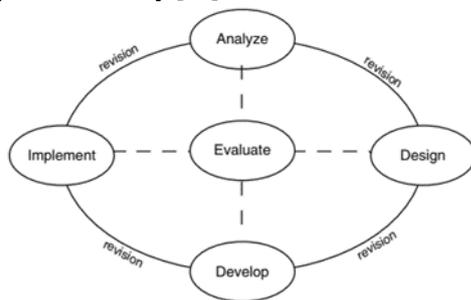


Fig. 1. Model ADDIE Development

### A. Analyze

At this stage, needs analysis or needs assessment. The analysis carried out at this stage include:

- 1) Conducted interviews to tutor related problems experienced by children who learn mild mental retardation.
- 2) Determine the learning objectives to be achieved in learning competencies
- 3) Set goals that will be addressed are mild mental retardation of children in 1st grade in SLB Tunas Kasih Surabaya.
- 4) Identifying the necessary resources can support the achievement of learning goals by using the media D'Match Number.
- 5) Creating a management plan for the product.

### B. Design

At this stage done is to design a media that will be used for the learning process. By processing the initial information that has been obtained through interviews that at this stage there are some steps:

- 1) Investarisasi performs tasks that the material used is material number and color recognition abilities and determine the subject matter experts, media and instructional design.
- 2) This stage is mention of performance goals matter experts and media experts that the experts as a validator,
- 3) Produce a testing strategy.

### C. Development

- 1) Generate content that is a matter of numbers and colors are packaged in the form of media D'match Number.

- 2) Develop accompanying materials for learners. Materials used as a guide accompanying media usage D'match Number.
- 3) Develop accompanying materials for teachers. Accompanying material is used as a guide for teachers to use the media D'match Number.
- 4) Validate the material on that subject matter expert Dra. Hj. Siti Mahmudah, Kes.
- 5) Validate the media on media expert Utari Ibu Dewi, S.Sn, M.Pd.

### D. Implementation

The implementation phase is carried out by experts of media and subject matter experts. This is due to the limited ability of the child mild mental retardation in testing so that the conduct is the subject matter experts that Dra. Hj. Siti Mahmudah, Kes. and Mrs. Citra Fitri Kholidya M.Pd., while media experts are Utari Mother Goddess, S.Sn, M.Pd.

### E. Evaluation

- 1) Determining the evaluation criteria. The evaluation criteria are seen from comparing the pre-test and post-test were tested for mild mental retardation children before and after using the media D'match Number. So they will know the difference.
- 2) Choosing an evaluation tool that is the calculation of data from the test instrument that has been made.
- 3) To evaluate.

## III. DISCUSSION

### A. Analyze

At this early stage do a needs analysis activities (needs assessment) and find data that support of research to be conducted. The initial step is to interview about the problems of learning in SLB Tunas Kasih Surabaya on September 17, 2018. In the interview obtained informs that mild mental retardation of children in 1st grade, can not write the numbers 1 to 10. As well as the only available media such as books sober students, media pickup and LCD. Teacher aide also explained that the average value of them under 70. The KKM which contains 6 students and there is only 1 student a little more familiar than others.

### B. Design

At this stage two activities must be done is making the design of the materials used in the media and designing products that will be used in the learning process.

### C. Development

The next stage is to develop products from the initial design is starting to design using Corel Draw X5, ranging in size, color, and shape. Who then performed the direct manufacture of media such as selecting materials to be used, and paint that will be used and about the writing of typography. If several steps above have been done then the next stage is to design an accompanying material that will be used to guide the use of media. Then there is the preliminary data obtained from media experts, subject matter experts and instructional design experts on the development of media Three dimensional mediaas well as

criticism and suggestions for improvement of instructional media.

Design Media:



Fig. 2. The composition of the Top



Fig. 3. Under the arrangement

1) Expert validation of RPP to Instructional Design

Do the lecturers Curriculum and Educational Technology. In the validation of RPP by expert instructional design, the result of 100%. RPP used in the process of learning to use media Three dimensional media included in both categories once and fit for use without revision.

2) Validation Expert Content

Performed at the faculty of Special Education. At the material validation by subject matter experts, the result 96.86%. The material used in the process of teaching and learning activities using the media Three dimensional media included in either category yet. Of validation material to provide input that in any given test must be following the ability of learners at each meeting.

3) Validation Expert Media

Do the lecturers Curriculum and Educational Technology. In the accompanying material validation by media experts, the result 94.12% and media 100%, both results in the category of very well and do not need to be revised only need to add an exclamation mark on the cover media.

Capabilities Mild Mentally Retarded Children in understanding Figures Introduction Materials and Color. Then from the pre-test and post-test were analyzed using the Wilcoxon the following formula:

$$Z = \frac{T - \mu_T}{\sigma_T} \frac{T - \frac{N(N+1)}{4}}{\sqrt{\frac{N(N+1)(2N+1)}{24}}}$$

The results obtained after calculation as follows: mean () = 10.5 and the standard deviation was obtained (= 4.77), when entered into the formula, will get the following results:  $\mu_T \sigma_T$ )

$$\begin{aligned} Z &= \frac{T - \mu_T}{\sigma_T} \frac{T - \frac{n(n+1)}{4}}{\sqrt{\frac{n(n+1)(2n+1)}{24}}} \\ &= \frac{0 - 10,5}{4,77} \\ &= \frac{-10,5}{4,77} \\ &= -2.201257862 \\ &= -2.20 \\ &= 2.20 \end{aligned}$$

With the above calculation, obtained  $\alpha 5\% = 1.96$ , where n = number of samples, amounting to 6 children are accepted if Zhitung  $2.20 > 1.96$  Ztabel and accepted if Zhitung  $2.20 < 1.96$ . So it can be concluded that by applying the media. Three dimensional media is very effective in the learning process SLB shoots Love Surabaya and learning outcomes of students also increased  $H_a$  and  $H_0$ .

D. Implementation

In this trial conducted by a step test on media expert. This is because of limitations on child mild mental retardation. At this stage the expert judgment techniques used to conduct the application before the media used for mild mental retardation children. So that the activities of this application have been validated by media experts.

E. Evaluation

This evaluation process results in the following data: at this stage of the conformity assessment analyze the topic with the media D'Match Number. In the design phase of proper assessment of the document Three dimensional media inter alia identification programs, lesson plans, and accompanying materials. At this stage of developing a proper assessment of the media element Three dimensional media of the color, shape, texture, and materials. While at the implement stage proper assessment of the use of media Three dimensional media learners disabled 1st grade in SLB Tunas Kasih Surabaya but on this implement, stage testing stage performed by the media because they are not able to validate them.

IV. CONCLUSION

Three dimensional media of media development is included in the area of developing technology that is at the design domain messages. From these statements, we can conclude the development of media Three dimensional media is a design development message that helps in the learning process. Media was selected and developed by the procedures and criteria for the selection of media to

TABLE I. RESULTS OF PRE-TEST AND POST-TEST

No	Name	Pre-Test	Post-Test	Difference	Change of Signs
1	NA	60	80	20	+
2	VN	60	80	20	+
3	NA	50	80	30	+
4	OA	65	85	20	+
5	JC	65	85	20	+
6	F	60	80	20	+
Average Nata Value		60	81.6		

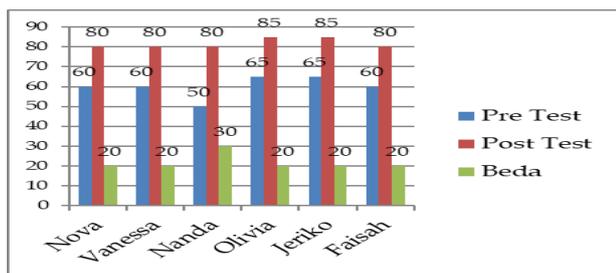


Fig. 4. Results of Pre Test and Post Test

overcome the problems of mild mental retardation in children studying in 1st grade in SLB Tunas Kasih Surabaya.

From the calculation of the data obtained it can be concluded that the media Three dimensional media can be used effectively and efficiently during the learning process for children grade 1 mild mental retardation in SLB Tunas Kasih Surabaya.

#### REFERENCES

- [1] G. S. Becker, *Human capital: A theoretical and empirical analysis, with special reference to education*. University of Chicago press, 2009.
- [2] T. P. Alloway, S. E. Gathercole, H. Kirkwood, and J. Elliott, "The cognitive and behavioral characteristics of children with low working memory," *Child Dev.*, vol. 80, no. 2, pp. 606–621, 2009.
- [3] B. G. Davis, *Tools for teaching*. John Wiley & Sons, 2009.
- [4] A. S. Bryk and L. M. Gomez, "Ruminations on reinventing an R&D capacity for educational improvement," *Futur. Educ. Entrep. Possibilities Sch. reform*, pp. 181–206, 2008.
- [5] A. Kristanto, "Pengembangan Model Media Video Pembelajaran Mata Kuliah Pengembangan Media Video/Tv Program Studi Teknologi Pendidikan Fakultas Ilmu Pendidikan Universitas Negeri Surabaya," *J. Teknol. Pendidik.*, vol. 11, no. 1, pp. 12–22, 2011.
- [6] A. Kristanto, *Media Pembelajaran*. Surabaya: Bintang Surabaya, 2016.
- [7] A. Kristanto, "The Development of Instructional Materials E-Learning Based on Blended Learning.," *Int. Educ. Stud.*, vol. 10, no. 7, pp. 10–17, 2017.
- [8] A. Kristanto, A. Mariono, and D. W. Nuryati, "Developing Media Module Proposed to Editor in Editorial Division," in *Journal of Physics: Conference Series*, 2018, vol. 947, no. 1, p. 12054.
- [9] D. H. J. M. Dolmans, W. De Grave, I. H. A. P. Wolfhagen, and C. P. M. Van Der Vleuten, "Problem-based learning: Future challenges for educational practice and research," *Med. Educ.*, vol. 39, no. 7, pp. 732–741, 2005.
- [10] Y. Munadi, *Media Pembelajaran Sebuah Pendekatan Baru*. Jakarta Selatan. GP Press Group, 2013.
- [11] R. M. Branch, *Instructional design: The ADDIE approach*, vol. 722. Springer Science & Business Media, 2009.