THE EFFECTIVENESS ON THE USE OF MULTIMEDIA TO IMPROVE BASIC READING SKILL OF HEARING-IMPAIRED STUDENTS

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Abstract:

Hearing-impaired individual experiences a great obstacle in their hearing system. One characteristic of hearing-impaired people is regarding the inability to receive the information verbally. Thus, the information which comes to them should be transferred to the front of them. In addition, hearing-impaired people tend to receive the information through visual, tactile, a kinaesthetic approach. This study aims at examining the improvement of reading ability of hearing-impaired students using multimedia learning. This study employed single subject research approach using multielement-design. The subject of this study was five hearing-impaired students. This study was conducted in 19 meetings and consisted of baseline and intervention stages, by imposing 100 vocabularies. The results of this study showed that (1) the use of three-dimensional learning media improves the reading ability of the subject. (2) The use of two-dimensional learning media improves the reading ability of the subject. (3) The use of word guessing animation improves the reading ability of the subject. (4) The use of multimedia learning in the form of artificial and original object, three-dimensional media, and word cards and word guessing animation improves the reading ability of the five subject tested.

Keywords: learning media, basic reading, hearing-impaired students

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1. Introduction

Hearing-impaired students are students with hearing impairment. The levels of hearing impairment are diverse. Hearing-impaired people have obstacles that occur in language development (Meadow, 1980). The size of the obstacles of language development of hearing-impaired children depends on the type of impairment, during hearing loss and the level of hearing loss (Slavin, 2009). Hearing-impaired students have difficulty in receiving sound stimuli or sounds that surround them. Thus, they are also difficult to respond or adapt to the environment. Hearing-impaired children completely receive information through visualization. These auditory barriers have an impact on the development of spoken language.

The difficulties and inability in following learning process for hearing-impaired students require facilities that assist their learning. The Role of Learning Technology, in this case, is to find a solution to how students can learn easily. Learning Technology is the study and practical ethics to facilitate learning and improve performance by creating, utilizing, and processing the appropriate technology and learning resources (Januszewski & Molenda, 2007). Technology should be used as a means of constructing knowledge that students learn "by", not "from" (Jonassen, Carr, & Yuch, 1998). To facilitate the learning activity can use technology or learning resources.

The availability of media is essential to stimulate student activities (Degeng, 2013). Similarly, according to Seels and Richey (1994), the use of media in learning is very important because the use of media is a systematic use of learning resources. This utilization is an activity using process and learning resources. This means that those involved in utilization have a responsibility to match students with specific materials and activities.

There are numerous learning media that support the precision of the learning process. The role of learning technology in conditioning learning media places in the development stage. Seels and Richey (1994) organize in four categories. The four categories are printed technology, audiovisual technology, computer-oriented technology, and integrated technology. Setyosari and Sihkabudin (2005) classify by their physical form and character, the type and level of experience gained, the sense perceptions obtained, their use, and based on the hierarchy of their use. In accordance with the above-mentioned opinion, the conditioning of instructional media will be adjusted with the material to be submitted. In addition to adjustments to the material, the prospective recipient of the material or information, in this case, the student is also taken into account.

The determination of learning media is closely related to the goals to be achieved in learning. Learning media should be compatible with learning materials. To convey the material, it must be in accordance with the conditions of the students receiving the learning materials. This media will be very useful in the learning interaction. The interaction between students with the media is actually a manifestation of the act of learning (Degeng, 2013). When choosing instructional media it is important to remember that to whom the media will be used; How the condition of the students who receive it; Whether they have abnormalities or deficiency; and how the abnormalities or deficiency that happened.

Two-dimensional media is a media which its appearance without using the projection medium and it consists of the length and the width. This media can only be observed from one direction only. For instance of two-dimensional media such as maps, pictures, charts, and all types of media which are only seen from the flat side only. The utilization of word card media in research conducted by Surani and Mas'udah (2012), a result that teacher activity in managing learning using picture card is very good. Another case in research conducted by Chamdani, et al (2013) state that the use of word cards can improve mastery of English vocabulary. Supplementary, Scrolls, et al (2012) state that using the word card media can improve the reading ability of the first-grade students of elementary school. The result of learning accomplishment in cycle I was from 60% to 80%. While the student's reception obtained in cycle I from 63% to 74%. The results of research conducted by Bangun (2012) states that the ability to read on hearing-impaired students increased between 40% and 100% by using a card word (flash card).

Three-dimensional media learning is a media that looks without using media projection. This learning media has length, width and height or thickness and can be observed from any point of view (Setyosari & Sihkabudin, 2005). Learning media based on experience according to Thomas in Setyosari and Sihkabudin (2005) divide it into three levels of experience. The three levels are the real life experiences, the substitution of the real experiences and the experience of the words only. Some studies have been conducted to examine the effectiveness of learning media using artificial objects or models that are three-dimensional media (Ailarasati and Nurhenti, 2013). In the research, it was obtained that the utilization of three-dimensional model media or artificial objects has a significant influence on the vocabulary ability. Other researches were conducted by Krisnawati and Supriyono (2013). Based on their research, the utilization of three-dimensional media or artificial objects improves students' learning achievement by 26% on learning with a thematic approach.

The next learning media is animated media. This media is an interactive multimedia which contains animation. Munir (2012) states that animation is a display that combines text, graphics and sound media in a single movement activity. The animation is basically a series of drawings or writings that are processed in such a way as to form movements. In this animation is presented image object, then raised the name of the object in the hand gesture, then followed by the alphabet finger that forms the name of the object, followed by the symbols of the alphabet that form the name of the object. The results of previous research conducted by Sari and Samawi (2014) obtained the result that there is the influence of the use of animation media to the results of science learning for low achiever students in V graders. The results obtained by using the media animation were 61.6. While after using the animation media obtained results of 80.0, meaning there is an increase of 18.4 points. Other researchers are Margarita and Wahyuno (2014). The result of this research is the increase of science learning activity of Class II SDLB-Tunarungu equal to 22,67%, and learning result equal to 8,84%. While Taufik (2012), obtained student learning results increased 14% after using the media presentation power point.

Hearing-impaired students experience obstacles in reading learning. This means that these students require special needs and treatments. In other words, these students need an action that can change their reading ability by providing special services according to their needs. Similarly, as suggested by the results of research Junaidi (2005), namely students who have a hearing impairment impacts on reading ability should get special services for students' reading ability increases.

A field study has been conducted by observation in 2nd Grader of Elementary School for Exceptional Children (SDLB-B for hearing-impaired students) Malang in January 2014. In the 2nd grader, there are four male students and one female student, with different hearing impairment and different level of intelligence. The observation followed by interviewing classroom teachers. The results of observation and interviews obtained information that to improve students' knowledge about the objects that are used every day is by utilizing picture learning media.

The pictures installed in observations class were images of objects that are often used in everyday activities. The pictures are installed by function. For instance, for the things related to the eatery, it was used kitchen and meal utensils pictures. As well as for bathing necessity, it was used bathroom utensils. The picture also shows several things such as transportation, animals, school utensils, and weather and condition. The picture had no name of the things.

Students know the function of the utensils or have seen the animal whose picture is attached to the class wall. When asked about the name of the object, students shook

their heads indicating that the student did not know the name of the object. Likewise, if they are shown the name of the things was wrong to pair it. The answer given them is by giving hand gestures about the function of the object. Students do not know the name of the object.

The approach chosen to contribute in order to improve the reading ability of these hearing-impaired students are learning media in the form of three-dimensional objects of both original and artificial objects, two-dimensional media in the form of word cards, and power point presentation media in the form of animation. The choice of three-dimensional media is because the object is real and can be seen or touched. While the two dimensions of a word card can make it easier to recall what the names of objects that have been known. Media presentation power point in the form of animated guess words selected for viewing the students in the present is enjoying playing with multimedia. Students can better understand the explanation if it is delivered in words and images rather than if presented only in words (Mayer, 2009).

According to the aforementioned description, in order to improve the quality of learning, teachers should be able to choose the right learning media. This means that the selection of instructional media should be based on learning objectives, learning materials and to whom the learning media will be used. Learning media used in assisting the learning of hearing-impaired student is a learning media dealing with visual and kinesthetic media. The author will try the learning by adding learning media.

In this study, the authors used learning media in the form of artificial materials, word cards (flash cards) and guessing game animation for basic reading learning. The authors were intrigued at knowing to what extent the effectiveness of the use of multi-media, the original or artificial materials, word cards (flash cards) and animation game guess words can improve the reading ability of 2nd Graders of Elementary School for Exceptional Children. The design of service provision of learning in this study is individual. Therefore, this research is a single subject research.

To understand further the issues regarding basic reading skill on a hearing-impaired student should be started from the development of their language acquisition. Myklebust in Bunawan and Yuwati (2000) opine that the language acquisition of the children begin from what he or she heard at the very first beginning from the mother of the closest person in the family. In accordance with the experience of the children regarding first language acquisition, children will more likely learn by connecting the experience and language sign obtained through their hearing. Then, children will further understand to connect a thing with the language they acquire. This condition is called as receptive auditory of language. Further, children will express it through words

and it called by expressive auditory language or speaking. After reaching a school age, children will develop their language ability through the vision or visual approach, by reading (visually receptive) and writing (visually expressed). The development of children's language is in line with the Vygotskian's zone of proximal development.

Further, Myklebust in Bunawan and Yuwati (2000), develop the pattern in children with hearing impairment. He applies the achievement of children with hearing impairment as well as children with no hearing impairment. However, hearing-impaired children do not obtain language without visual or tactile, or a combination of both. Thus, the available three alternatives, in this case, are gestures, reading, and reading utterances.

Other experts argue that the introduction of the concept of an object or an event in children with hearing impairment occurs through the reception of individual vision (Marschark and Wauters, 2008). In daily life, hearing-impaired children receive information through vision, tactile and kinesthetic. Then, communicate it verbally to the hearing-impaired children who is still able to talk and through cues for the hearing-impaired who cannot talk. Thus, the development of language and communication ability of children with hearing impairment should be done through vision and utilize the remaining hearing.

How is the development of reading ability in hearing-impaired children? As long as hearing-impaired children live with their hearing-impaired parents, they are able to follow the language development. This happens as normal hearing children with normal hearing parents (Anderson & Reilly in Marschark, Marc, and Hauser, Peter C, 2008). It is further said that hearing-impaired children who are nurturing by hearing-impaired parents will also have an early language as commonly used by fellow hearing-impaired. Similarly, the language used by the normally hearing children living with the parent or the environment without hearing impairment. This is in line with the emergent literacy concept and Vygotsky perspective which emphasizes social and cultural aspects of learning (Krauss, 1996).

To solve the problems of phonological processes in reading within children with hearing impairment can be conducted through visual phonics. Visual Phonics is a system of forty-six hand signals on symbols of writing. This gesture is used in relationships between spoken languages, to represent the phonemic aspects of language and the relationship of phoneme imagery (Trazek et al. in Marcshark, 2008). In research conducted by Trazek and colleagues on kindergarten students and first-grade elementary school students, they did not use the comparison group. The results of the study indicated that hearing-impaired students are difficult to make progress in the ability basic reading.

2. Methodology

This study was conducted to contribute to hearing-impaired children. This research requires information to measure individual reading capability. The appropriate research method for special education is the single subject design (SSD) (Cakiroglu, 2012). This research method was designed by using single-subject research or SSR with group model that focus on data input from the individual group. The purpose of this study is to determine the effectiveness of the use of multi-media learning given repeatedly at a certain time in order to improve the reading ability of the 2nd Graders of Elementary School of Exceptional Children.

This research design used Multielement-Baseline Design (MBD) (Kratochwill, 1978). In his explanation, experimental research using individual group model has two related variables which are dependent variable and independent variable. The dependent variable in this study is a basic reading skill. In this research, basic reading skill deals with the ability to understand a vocabulary. The independent variables in this research are multi-media in the form of three-dimensional objects of both original and artificial, two-dimensional objects in the form of word cards (flash cards) and animation words guessing.

The multielement-baseline design is a design that uses several alternative conditions. As an alternative condition, here is some learning media, namely three-dimensional objects, two-dimensional objects and animated guess words. The researchers linked the initial condition as a baseline to the condition after the subjects were given an action or intervention. The MB design in terms of the Response to Intervention Model (RTI) is at -3 level (figure 3.1). At the level of -1 and 2 is not important in using the full experimental approach. Level-1 is called the response to learning and refers to a group of intervention procedures. In level-1 with experimental controls focused on the whole school will become unfocused. Feasibility will be the spotlight. In contrast to level-3, experimental control is very important, thus a single subject design (SSD) method requires incorporation of each baseline step.

In accordance with the effectiveness level, at level-1 by 20%, the effectiveness rate is 85%, while the 3rd-level effectiveness is 95%. From the three levels, the most effective are level-3, since it is the best systematic concept of analysis on variables related to the deficiencies of the invisible target and identifies each individual (Barnett et al., 2004 in Riley-Tillman, 2009). Multielement-baseline Design and similar designs are the best measurements to use.

The best level-3 can be conceptualized as a systematic analysis of the appropriate incontructional variables to isolate the deficit of target skills and identify interventions

for each subject. It is best done through SCD analysis (Barnett et al., 2004 in Riley-Tillman, 2009). The main analysis at Level-3 is to identify the causal relationship between the deficit and the intervention in order to develop appropriate interventions.

According to 2006 Curriculum KTSP of Indonesia for 2nd Graders of Elementary School for Exceptional Children, the students' ability is to accomplish 10-15 short sentences reading in a text, to be able to answer questions from the text. The target of vocabulary enhancement in this study is 100 vocabularies. This study was conducted 19 times meeting. Baseline required for the subject I am 1 meeting and 18 intervention meetings; subject II is 2 meetings and 17 intervention meetings; subject III is 3 meetings and 16 intervention meetings; subject IV is 4 meetings and 15 intervention meetings, subject V is 5 meetings and 14 intervention meetings to accomplish 100 vocabularies.

3. Findings

Multielement-design using visual graphic analysis was used to improve vocabulary enhancement. The analysis of this study is to understand and discover the progress of vocabulary enhancement and was conducted through two steps as which include size effect and increasing level. The results of vocabulary acquisition in each subject are presented in the following figure.

In accordance with Figure 1, within intervention stage using learning media animation words guessing, the Subject I was able to read and understand 75 vocabularies. In the intervention using multimedia learning in 6 meetings with the increasing level of 21.5, Subject I can acquire 25 vocabularies. Thus Subject I can read 100 vocabularies or 100% of target 100 vocabularies. From 100 vocabularies which are expected to be read, Subject I can read and understand all vocabulary through 19 times meeting.
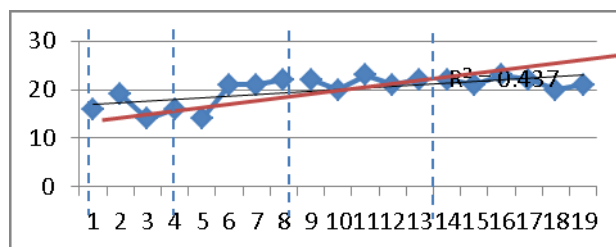

Figure 1: Multielement-Design of Subject I

During the intervention using learning media of words guessing animation, the Subject II was acquiring 58 vocabularies. Intervention given to Subject II increased 21 vocabularies in five meetings conducted. The following Figure 2 exposed the level of increase in intervention stage. It shows that the level of increase was decreasing in 12.6.

Subject II could understand 79 vocabularies or accomplished 79% from 100 target words of accomplishment.
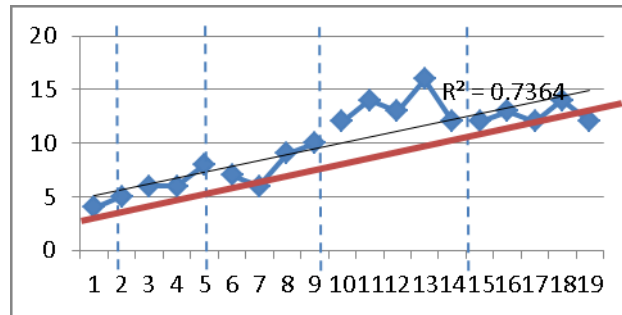

Figure 2: Multielement-Design of Subject II

During intervention stage, subject III acquired 66 vocabularies. In this intervention stage using multimedia learning model, Subject III obtained an increasing point on the figure of 13.5 and confirmed acquiring 34 vocabularies. Hence, It proved that the Subject III has succeeded 100 vocabularies and accomplished 100% from the target.
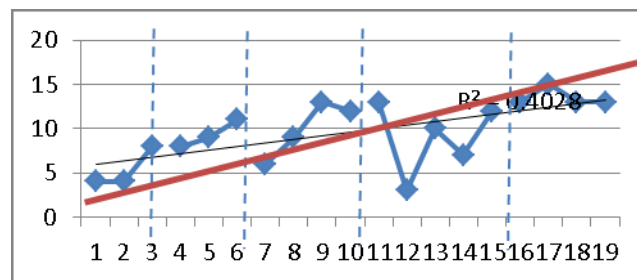

Figure 3: Multielement-Design of Subject III

While Subject IV, during the intervention stage using words guessing animation, Subject IV accomplished 63 vocabularies. Subject IV experiences 15 new vocabularies during the treatment in three meetings. The following figure 4 exposes the increasing result of the Subject IV. It obtained 12.67 points of decreasing. The subject IV could read 78 vocabularies or accomplished 78% from 100 the target imposed.
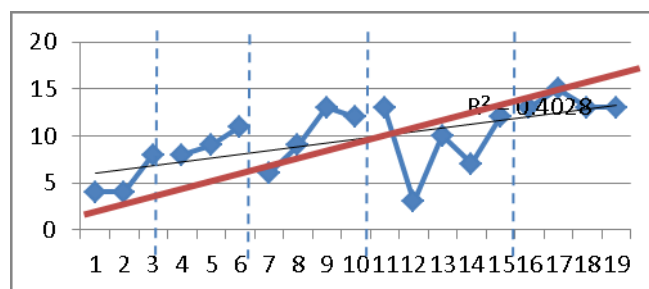
Figure 4: Multielement-Design of Subject IV

During the intervention treatment using multimedia learning, Subject V accomplished 75 vocabularies. In this intervention stage using multimedia learning Subject V moderately significant which obtained 25 vocabularies and reached 19 points in figure 5. It means that Subject V accomplished 100% from the target imposed.
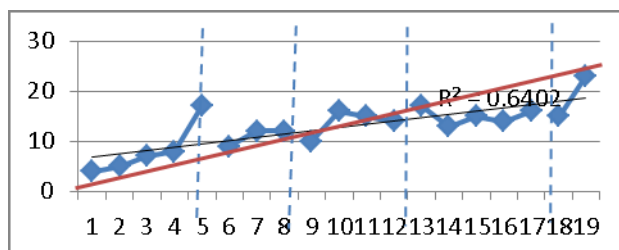

Figure 5: Multielement-Design of Subject V

The changes in the basic reading ability of the five subjects based on the data analysis obtained the value of d = 0, 5736. The obtained value 0.5736 is considered as a large effect size. This value indicates that the intervention data conducted in this study experienced a major change to the five subjects, i.e. 57% were above the baseline. The average result of 0.5736 R 2 has a large effect size or can be defined as a significant change of 57% on the basic reading ability using multimedia learning.

4. Conclusion

Pursuant to the results of data analysis above, several points can be drawn as a conclusion, they are: (1) the use of three-dimensional learning media, both artificial or original object, improves the reading ability of the five subject tested; (2) the use of two-dimensional learning media also improves the reading ability of the five subject tested; (3) the use of learning media in the form of word guessing animation improves the reading ability of the five subject tested; (4) The use of multimedia learning in the form of artificial and original object, three-dimensional media, and word cards and word guessing animation improves the reading ability of the five subject tested. In addition, this study suggests that hearing-impaired students are more likely to be able to receive and acquire learning through a visual approach. Thus, it is suggested for (1) future researcher in conducting more study on the use of visual media learning in order to develop the learning media for hearing-impaired students. (2) For the teacher who teaches hearing-impaired students, it is suggested to conduct more learning activity using multimedia learning model in order to make the learning outcomes becomes more effective in regard to the hearing-impaired student's condition.

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