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Needs Analysis of Innovative Visual Learning Media for Special School Teachers in Mathematics Learning for Deaf Students

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Abstract

The purpose of the study was to determine the need for media, especially innovative visual media in learning mathematics for deaf students in Surakarta. The method used in this study was qualitative and quantitative. The subjects of this study were 35 teachers from several special schools in Central Java. The data collection technique using a questionnaire with a Likert scale refers to the aspects of the need for mathematics learning media, namely the interesting media aspect, the media convenience aspect and the media suitability aspect. The data analysis technique used a descriptive analysis approach. The results obtained an average of 3.27 (very high) for the attractive media aspect, 3.33 (very high) for the ease of media aspect and 3.31 (very high) for the media suitability aspect. Towards innovative visual media is included in the very high category.

Keywords: deaf; innovative visual media; mathematic

Abstrak

Tujuan penelitian untuk mengetahui kebutuhan media, khususnya media visual inovatif dalam pembelajaran matematika siswa tunarungu di Surakarta Metode yang digunakan dalam penelitian ini adalah kualitatif kuantitatif. Subyek penelitian ini adalah 35 orang guru dari beberapa SLB di Jawa Tengah. Teknik pengambilan data menggunakan angket dengan skala likert mengacu pada aspek kebutuhan media pembelajaran matematika yaitu aspek media yang menarik, aspek kemudahan media dan aspek kesesuaian media. Teknik analisis data menggunakan pendekatan analisis deskriptif. Hasil penelitian diperoleh rata-rata 3,27 (sangat tinggi) untuk aspek media yang menarik, 3,33 (sangat tinggi) untuk aspek kemudahan media dan 3,31 (sangat tinggi) untuk aspek kesesuaian media, Dapat disimpulkan bahwa tingkat kebutuhan guru SLB terhadap media visual inovatif termasuk dalam kategori sangat tinggi.

Kata kunci: media visual inovatif; matematika; tunarungu

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INTRODUCTION

Every Indonesian citizen has the same rights in terms of obtaining education, this is stated in the UUD 1945 pasal 31 ayat 1 dan UU Nomor 20 tahun 2003 tentang Sistem Pendidikan Nasional bab IV pasal 5 ayat 1. Children with special needs as citizens have the right to obtain educational services with the same opportunities as normal children. According to Alimin (2012) children with special needs are children who have developmental and learning barriers, including children with disabilities. Meanwhile, Desiningrum (2016) stated that children with special needs are children who require special treatment because of developmental disorders and abnormalities experienced by children. This can be interpreted that these children with special needs actually require special handling and attention in their education so that they can develop their potential.

Deafness is a state of hearing loss covering all levels, both mild, moderate, severe, and very severe which will result in communication and language disorders (Fidiawati, 2012). Sholihah (2015) stated that deaf children have a deficiency in hearing which results in difficulty in communicating. Lack or loss of hearing ability either partially or completely faced by deaf students results in them not being able to use their hearing aids in everyday life which can have an impact on their lives in a complex way, both in receiving lessons, and in interacting in society. This causes deaf students to lag behind in terms of education compared to other normal students. The low level of student mastery is due to students' lack of understanding in understanding the concepts given by the teacher (Darmiyati, 2009).

Deaf children generally need educational facilities that are relatively the same as normal children. Because of the obstacles in hearing and speaking, special aids are needed, for example: audiometer, hearing aids, audiovisual (in the form of films, video tapes, and television), tape recorders, spatels, mirrors, and pictures. The fact that occurs in the learning process the teacher only explains the concepts accompanied by examples then students only memorize the subject matter. Besides, the questions presented in most books also do not relate mathematics to the context of students' daily lives. Teachers have not been able to create a pleasant learning climate for students and have not been able to think creatively. Learning will be meaningless and tend to be boring. This means that to understand a concept, children still have to be given activities related to real objects or real events that can be accepted by their minds. Mainly in mathematics (Mariyah, 2015). This statement further strengthens that the use of appropriate media is very important for the deaf which can help facilitate the learning process of mathematics subjects. This audio-visual media is very useful for students who are deaf, because through audio-visual media, deaf students can pay attention to something that is displayed, even though their hearing ability is limited.

Today, the development of educational services for children with special needs has begun to show progress. Not apart from deaf children, they have the right to education like other children, Law Number 20 Undang-Undang Nomor 20 Tahun2003 tentang Sistem Pendidikam Nasional pasal 5 ayat 2explains that "citizens who have physical, emotional, mental, intellectual, and/or social disorders have the right to receive special education".

The constraints that have been previously disclosed certainly cause difficulties for teachers in delivering learning material because deaf students have problems in hearing, besides that students' limitations in vocabulary also become obstacles in delivering subject matter. This requires the creativity of teachers in developing innovative and creative learning media to deal with these obstacles. Teaching will run more effectively if the object of teaching can be visualized realistically to resemble the actual situation (Khaer, 2008). Students will more easily understand learning through visualization of learning materials.

Research says that learning environments that use technological media can improve students' grades, their attitudes towards learning, and the evaluation of their learning experiences. the use of media using audio-visual or computer media can help students get useful lessons. Learning strategies

must be chosen to motivate learners, facilitate the learning process, form a whole person, serve individual differences, promote meaningful learning, encourage interaction, and facilitate contextual learning.

Effendi, et. al (2006) in his research on "The Use of Picture Story Media Based on a Total Communication Approach to Improve the Language Skills of Low-Class Deaf Children in SLB B YPTB Malang" suggests the use of illustrated story media through total communication in improving the language skills of deaf children. The sense of sight plays a very important role in the interaction and communication of deaf children, as well as in the process of gaining visual perception experiences. Learning through visual media can stimulate deaf children who are limited in terms of their auditiveness in receiving learning materials.

Several studies have been conducted on mathematics learning for deaf students, including (1) Sediyono and Malatista (2010) researched on the mathematics learning model for fourth grade students of SDLB with hearing and speech impairments using the computer-assisted komtal method. The results showed that the komtal method through computer assistance can be used for learning models, because it is able to improve student achievement in learning based on the scores obtained by students. (2) In learning mathematics for deaf students at SLB N 2 Bantul, it is necessary to develop attractive realistic mathematics learning designs (Sulisetiawati et al., 2018). (3) Research by Desak Putu Eka Nilakusmawati. et al, (2015) revealed that with audiovisual science and mathematics learning models can be made more interesting so that students can concentrate and better understand the intent of the learning material presented, and can help students understand the concepts of the teaching material. Mulyadi (2015) stated that there is still little research in the field of education, especially mathematics for children with special needs. Meanwhile, children with special needs are different from general students, so the learning process is also different. Therefore, researchers are interested in analyzing the need for innovative visual learning media in learning mathematics for deaf students**.**

METHOD

The method used in this research is quantitative qualitative. Quantitative data were obtained in the form of scores from the teacher's response questionnaire assessment which contained the variables of learning media needs in mathematics subjects (Arsyad, 2013), there are 3 indicators, namely attractive media with a total of 8 items, ease of media with 6 items and media suitability with 6 items. Which is then analyzed and described, the teachers who became the subject of this study amounted to 35 teachers in Surakarta.

Sugiyono (2012: 128), states that the research instrument is a tool used to measure the observed natural and social phenomena. With this instrument, it will be easier for researchers to conduct development research in order to achieve good results. This research uses a teacher response questionnaire instrument. The teacher's response questionnaire was used to assess the need for innovative visual learning media based on the teacher's responses and responses. Student response

questionnaires were compiled with 4 alternative answers, namely Very Need, Need, Don't Need, and Really Don't Need.

Quantitative data analysis in this study aims to obtain the value of validity, practicality, and effectiveness of innovative visual learning media based on the assessment of teacher respondents. Here is more explanation further on data analysis in the development research conducted.

a. Data Analysis of Response Questionnaire Results

The teacher's response questionnaire or questionnaire aims to find out their responses as well as a basis for knowing the need for innovative visual media. This questionnaire consists of four answer choices with the assessment categories in Table 2.

Table 2. Grading Scale criteri

Category	Score	
	Positive statement	Negative statement
Very Need	4	1
Need	3	2
Don't Need	2	3
Really Don't Need	1	4

The steps to get the results of the teacher response questionnaire analysis are as follows.

1) Calculate the average score with the following formula.

$$\chi = \frac{\Sigma \chi}{n}$$

with = mean score; = total score of each component; n = number of raters.

2) Convert the mean score of the instrument into a qualitative value
The scores obtained are then used as qualitative data using a Likert Scale. Referring to the table of 4 scale values according to Mardapi (2008) the reference value conversion is as follows:

Tabel 4. Likert scale according to Mardapi

No	Score	Category
1	X >	Very positive/very high
2	3 > X ≥	High/positive
3	2,5 > X ≥	Negative/low
4	X <	Very negative/very low

RESULTS AND DISCUSSION

This research was conducted with the object of research 35 SLB teachers in Surakarta. In this trial the teacher was given a questionnaire and asked to fill out the questionnaire by giving a checklist in the column Really Need, Need, don't need, and Really don't need on the questionnaire sheet provided by the researcher. The following is a table of questionnaire results for the needs of mathematics learning media for teachers of deaf students.

Tabel 5. Result From Teacher

No	Indicator	Score	Criteria
1.	Learning mathematics requires media learning that can attract students' attention	3,2	Very Need
2.	Media is needed in conveying material	3,4	Very Need
3.	Teachers need innovative visual media that easy for students to understand	3,1	Very Need
4.	Innovative visual media are needed by students in learning mathematics	3,1	Very Need
5.	Mathematics subjects need effective media	3,0	Need
6.	Media is needed to help students understand mathematics learning	3,0	Need
7.	Learning mathematics requires learning media that can attract the attention of deaf students	3,0	Need
8.	Learning mathematics requires innovative visual media for learning that can attract the attention of deaf students	3,4	Very Need
9.	Media is needed to improve mathematics learning achievement	3,5	Very Need
10.	Media is needed to improve the mathematics learning achievement of deaf students	3,5	Very Need
11.	Innovative visual media are needed to improve mathematics learning achievement of deaf students	3,5	Very Need
12.	Teachers need media to increase the interaction of deaf students	3,2	Very Need
13.	Teachers need media to increase the learning motivation of deaf students	3,4	Very Need
14.	Teachers need media to increase the interest of deaf students	3,0	Need
15.	Media is needed in low grade mathematics learning for deaf students	3,4	Very Need
16.	Innovative visual media is needed in low grade mathematics learning for deaf students	3,3	Very Need
17.	I need the right innovative visual media to be used in learning mathematics for deaf students	3,6	Very Need
18.	Teachers of deaf students need to develop the use of innovative visual media	3,5	Very Need
19.	The practice of using innovative visual media is needed by the teacher	3,1	Very Need
20.	Innovative visual media with the help of gadgets is needed by students	3,5	Very Need

Based on the assessment questionnaire table above, it was obtained data that 35 respondent teachers stated that innovative visual learning media in mathematics learning were needed. This can be seen from the average score (x) of the assessment of the need for innovative visual learning media of 3.3 which is in the very good category. The data was obtained from the conversion according to the four scale Mardapi (2008). Furthermore, the researchers conducted product trials which were categorized into several aspects as shown in Table 6.

Table 6. Result From Each Indicator

No.	Category	Score
1	Interesting Media	3,27
2	Media Usable	3,33
3	Media Compability	3,31
	Average	3,33

Based on the test results above, the interesting media aspects on the need for innovative visual learning media in mathematics learning get a score of 3.27 with the category of Very Need. This shows that teachers need interesting media in delivering mathematics learning. Furthermore, the test results on the aspect of media convenience on the need for innovative visual learning media for mathematics learning obtained the highest average score compared to other aspects, namely 3.33 with the category of Very Need. This shows that teachers need the ease of media in delivering mathematics learning.

Based on the test results on the aspect of the suitability of the media on the needs of innovative visual learning media learning mathematics gets a score 3.31 with the Need category. This shows that teachers need the appropriateness of the media in delivering mathematics learning. It can be concluded that the average value of the aspects obtained is 3.33 (very Need)

CONCLUSION

Based on the results of the research that has been done, it can be concluded that teachers need mathematics learning with innovative visual learning media, and it is necessary to develop mathematical learning designs with attractive and innovative visuals. This is indicated by the results of the needs assessment of innovative visual learning media with an average score of 3.3 which is included in the very good category. Positive student responses and increased grades along with the delivery of material from the teacher through innovative visual media. Visual media help students receive information through the senses that are still functioning normally so that they can maximize students' potential in capturing learning material.

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