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The Development Learning Video of Cube And Cuboid for Deaf Students in the 3RD Grade of Middle School

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Abstract

This research was aims to develop video instructional media of cube and cuboid for deaf students. The background of doing this research instructional media is not only required by means of the normal students, but it is needed by the students who have special needs like deaf students also. Observation result addresses that the deaf students are inclined to be slow in catching the materials are given due to the lack of media, difficulty in imagining cube and cuboid, and forget the materials are given. In accordance with the students' characteristics and needs, it requires the visual-based media. This research typically employed research and development method. The result of validation based on the assessment of media practitioner with the scale starting from 0 to 5 was 4.42, and material practitioner from 0 to 5 was 4. The result of validator's assessment demonstrated that this instructional media can be available to use. The result of students' response in using this instructional media was 74.5 %. It revealed that students' response to this instructional media was good. This research has added the Sistem Isyarat Bahasa Indonesia (SIBI), and accordance with the characteristics of deaf students and also has added animations from the Cabri3D software to help students observe the shape and characteristics of the building blocks and cubes.

Key words: instructional media, Deaf Students Learning Video, Cube and Cuboid

INTRODUCTION

Prastowo (2012) suggested that learning medium is necessary during the teaching process due to its ability to communicate and deliver the lesson effectively to students. Learning medium is not only necessary for regular students, but also students with special needs such as students with hearing disabilities. Deaf students often face problems especially those related to verbal communications. Observations that had been conducted suggested that deaf students in general posses the same level of intelligence with regular students, but due to their limited ability to hear, they tend to be slower to receive and process the lesson. This condition is worsen by the lack of learning medium that can help them to receive better understanding of the lesson. Written materials, facial expressions and gestures that is showed by the teachers are the sole assistance for them to understand the lesson.

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The difficulties in understanding the lesson usually occur during the lesson of 3D shapes, particularly in finding the face diagonal and space diagonal of a cube. Therefore, it is urgently needed for a learning medium that not only can help students to understand the lesson and attract their interest, but also recall their memory of the lesson. A learning medium that works effectively for deaf students is visual learning medium since visual ability is the thing they rely on the most during the learning process.

One of the visual media that can be used to deliver lesson is learning video. Previous research is conducted by Yunjiyani (2014) "Pengembangan Media Video Pembelajaran Materi Bumi dan Alam Semesta untuk Peserta Didik Tunarungu Kelas VI" suggested the insertion of sing language to clarify certain sentences or words that are barely known or used to deaf students. Another research from Amalia (2011) "Pengembangan Media Video Pembelajaran Pecahan Sederhana Pelajaran Matematika Kelas III Tunarungu di SDLBN Kedungkandang 04 Malang" suggested the attempt to understand the characteristics of target students so that teachers can create learning medium that is suitable for them. Based on the outlined problem, observations, and previous studies, it can be concluded that a learning medium for 3D shapes especially cube and cuboid is urgently needed to be developed. In this study, researcher attempted to create a learning video that employs Sistem Isyarat Bahasa Indonesia (SIBI) and subtitles. This learning video is also supported with a special mathematics software for geometry called Cabri3D so that the material delivered can attract the interest of students and be easily understood. The learning video mainly talks about cube and cuboid. According to Agus and Avianti (2008), cuboid is a 3D shape bounded by six quadrilateral faces which polyhedral graph is the same of that cube. Meanwhile, according to Nugroho and Meisaroh (2009), a cube is a 3D shape that bears 6 faces with the shape of square.

Cabri3D is an interactive mathematics software especially designed for geometry mean while the definition of Sistem Isyarat Bahasa Indonesia (SIBI) according to Lakshita (2013) is that SIBI is a language that emphasizes on manual communication, gestures, and lip movements to communicate. Based on those definitions, the aim of this study to develop learning medium in the form of video about cube and cuboid for deaf students.

RESEARCH METHOD

The development of learning video for math lesson is aiming to help teachers in delivering the lesson and also as an alternative way in teaching. This research employs Research and Development Model. Sugiyono (2015) suggested that this method of research is employed to create certain products and also examine the effectiveness of the products. According to Sugiyono (2015), there are several steps in employing this method, such as: (1) potency and problem, (2) the collection of data, (3) the design of product, (4) the validation of product, (5) the revision of product, (6) the examination of product, (7) the revision of product, (8) the testing of products on consumer. The subject of this study consisted of 5 deaf students of SMPLB YPTB Malang.

Instruments used in this study were material validation forms, medium validation forms, and questionnaire for students. Validation forms consisted of certain indicators aimed to collect response from experts regarding learning medium in development. This validation process is needed to measure the expediency of the learning video. The learning video was graded by an expert in mathematics and an expert in visual media. Questionnaire for students consisted of indicators aimed to collect students' opinion

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regarding the learning video. Data analysis employed in this study is the analysis of data that consisted of validation from the mathematics expert and visual media expert. Validations from experts contained statements are supported by rating using the method of rating scale from 1 to 5. This method was also applied on the questionnaire for students.

DISCUSSION

Discussion in this study emphasizes on the expediency of the learning video of cube and cuboid. The expediency was measured through the design of the video in validation process.

Table 1. Validity of Learning Medium

No.	Indicator	Rating
1	The compatibility of learning video with the characteristics possessed by deaf students	5
2	The compatibility of learning video with learning environment	4
3	The sequence of display on the learning video	5
4	Compatibility of design and animation of the video with students‘ characteristics	4
5	Medium’s ability to recall the lesson that had been taught	4
6	Medium’s ability to help students understand and memorize the lesson	4
7	Medium’s ability to enhance students‘ motivation to learn	5
8	The easiness of medium’s operating by teachers	5
9	The time efficiency possessed by learning medium	4
10	The energy efficiency possessed by learning media	4
11	The safety of medium during the usage	5
12	The quality of learning medium	4
Average Rating		4,42

(adapted from Rahmadhani, 2014)

Table 2 Validity of Material

No.	Indicator	Rating
1	The compatibility of material with lesson’s goal	4
2	The compatibility of material with medium	4
3	The compatibility of material with characteristics and level of difficulties possessed by deaf students	4
4	The potency of learning effectiveness using learning video	4
5	The depth of lesson’s material delivered	3
6	The clarity of lesson’s material and examples delivered	4
7	The sequence of lesson’s material delivered on learning video	5
8	The clarity of sentences and language structureof lesson on learning video	4
9	The compatibility of vocabulary with students‘ level of thought processing	4
Average Rating		4

(adapted from Latuversia, 2015)

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The first discussion is about the validity of the learning video about cube and cuboid. The visual media expert gave 4,42 for the video from the scale of 0 to 5, so therefore it can be concluded that the video was considered very proper. Meanwhile, the math expert rated the video to have a score of 4 from scale of 0 to 5 which means the material delivered in the video was also considered very proper. However, there were several suggestions from the experts, such as (1) explaining the material in sign language as the video is being played in background, (2) adding the animation of filling the 3D shapes with liquid during the lesson about cuboid's volume (3) the usage of equation and subtitle (4) extending the simulation of Cabri3D (5) adding the example of things in daily life that bear the shape of cube and cuboid. Not all of these suggestions could be applied on the revision process of the video due to lack of time. However, there were some suggestions that were applied, such as the insertion of equation and subtitle, extending the duration of Cabri3D simulation, and insertion of exampleof things in daily life that bear the shape of cube and cuboid. Other suggestions could be applied in future studies.

In previous study by Yunjiyani (2014) "Pengembangan Media Video VI", there was a suggestion to add sign language to emphasize and clarify certain words or phrases that were hardly known to students. In this study, researcher had had added sign language in the end of each sub section of the lesson, so it could be easily understood by deaf students and the subtitles also made it easy for regular students to understand the material. Another study by Amalia (2011) "Pengembangan Media Video Pembelajaran Pecahan Sederhana Pelajaran Matematika Kelas III Tunarungu di SDLBN Kedungkandang 04 Malang" gave a suggestion for future studies to pay attention on the characteristics of target students so a proper and suitable learning medium could be created for them. In this study, the learning video had been designed to match the characteristics of the target students which were deaf students in the 3rd year of middle school by adding some animations from Cabri3D to help them observe the shape and characteristics of cube and cuboid and also Microsoft PowerPoint to enhance the appearance of the animation that was shot using Super Screen Capture. Moreover, it was needed for sign language in Bahasa Indonesia to be added to help students get a better understanding of the lesson.

The next discussion is about students' response regarding the learning video. The response from the students was collected using questionnaire. Based on the response from the questionnaire, the rate of 74,5% was achieved, so therefore it could be concluded that in general, students had good response for the video. From all the process that have been done, it was concluded that this learning video was considered very proper and could be applied during the lesson of cube and cuboid for deaf students.

CONCLUSION

Based on the development process of this learning video, it can be concluded that there are 7 phases in the development process: 1) analysis result of potencies and problems showed that students who have hearing disabilities facing difficulties of abstracting things that can not be seen, having troubles in recalling the lessons that have been taught, and the lack of learning medium available at school, but these students possessed the same level of intelligence with regular students. These facts were taken into consideration as the base of the creation of this medium, 2) the data collection regarding the medium's development that consisted material of the lesson, characteristics and needs

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of the students. Analysis result showed that deaf students required visual medium in the form of video

Then 3) the first creation step of this video was the making of storyboard, the recording of SIBI scenes and the making of subtitles, the creation of cube and cuboid animations using Cabri3D which later then recorded using Super Screen Capture. The integration of SIBI video, subtitle and animations of cube and cuboid was done using Adobe Premier Pro, 4) validation process done by experts in mathematics and visual media showed a satisfying result, 5) revisions that were added to the video consisted the extending of Cabri3D simulation, the insertion of examples of cube and cuboid in daily life, and correction on subtitles regarding the width of cuboid's surface area, 6) trial phase of the video on 5 deaf students in the grade 3 of middle school achieved good response, 7) the final product in the form of video that has been validated by the experts. Therefore, this learning video is regarded as very proper and applicable.

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