

Implementation of Three-Dimensional Video by Teacher of Extraordinary School Based on Joyful Learning

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Abstract--The objectives to be achieved are: (1) improving teacher skills in mathematics learning in ES to be able to utilize the teaching aids in the form of the three dimensional videos; (2) improve the skills of ES teachers in developing of joyful learning assisted by three-dimensional video of teaching aids. In this activity, the "Alpha Production" Industrial House was also involved as a partner in the production of Three Dimensional Videos, which are as teaching aids for mathematics learning videos that are equipped with narrative and sign language systems. Stages of activities: (1) The research team designs Mathematics Teaching Aids in the form of instructional videos that are equipped with narrative instructions, and sign language systems. (2) "Alpha Production" as Industrial House Partners make teaching aids good and ready for use in ES. (3) Testing the Three Dimensional Video Media in State Extraordinary School of Salatiga. The results: (1) ES teachers are skilled in utilizing Three Dimensional Video in Mathematics learning. (2) ES teacher's skills in developing joyful learning assisted by the Three Dimensional Video of teaching aid are increasing.

Keywords: *Mathematics learning aids, joyful learning*

I INTRODUCTION

L1 Background

The implementation of education in Extraordinary School (ES) are to: (1) provide the widest possible opportunity for all students who have physical, emotional, mental, and social disabilities or have the potential for intelligence and/or special talents to obtain quality education in accordance with their needs and abilities; (2) realizing the implementation of education that respects diversity, and is not discriminatory for all students, (Riwanto, 2018). Figure 1 below shows the learning atmosphere in ES. Students seemed enthusiastic about learning mathematics, but without using teaching aids.



Figure 1: The learning atmosphere in ES.

This is what gives Mathematics Education Study Program lecturers of UNNES to be creative and innovate in helping ES students to be independent to actualize themselves to contribute to the country. According to Roth, *et al* (2018), things that need to be considered in helping students with disabilities in the school environment are effective accommodation and adaptation, as well as learning modifications and assessments (Depdiknas, 2007). On the other hand, mathematics has an important role in developments in the field of life and the field of information and communication technology. To master and create technology in the future, it requires mastery and understanding of good mathematics from an early age, (Sugiman *et al*, 2018). This encourages ES teachers to embed abstract mathematical concepts, through concrete learning media, hereinafter referred to as teaching aids.

ES from the very beginning had been hoping to get teaching aids and innovative learning models that are characterized by the use of three-dimensional video-based visual aids. This teaching aid is expected to help ES teachers in improving teaching skills, teaching quality, and in turn increases understanding for students in ES, especially in Salatiga.

I.2 Problems

The problem are as follows: (1) How to improve teacher skills in learning mathematics at ES to be able to utilize teaching aids in the form of three-dimensional video? (2) How to improve ES teacher skills in developing of joyful learning assisted by three-dimensional video teaching aids?

I.3 Research Objectives

The objectives of this activity are: (1) to improve teacher skills in learning mathematics at ES to be able to utilize teaching aids in the form of three dimensional videos; (2) to improve the skills of ES teachers in developing of joyful learning assisted by three-dimensional video teaching aids.

II. LITERATURE REVIEW

II.1 Children with Disability (CwD)

CwD has the same rights as normal children to get quality and sustainable education, (Imaniah & Fitria, 2018). Hopefully, CwD is able to live independently and participate fully in all aspects of life including in obtaining education. Education for CwD in Indonesia according to Government Regulation Number 72 of 1991 concerning Special Education, is organized through three types of educational institutions, namely: Extraordinary Schools (ES) and Integrated Education.

According to the Indonesian Central Statistics Agency, in 2018, people with disabilities in Indonesia are quite large based on statistics of 6,008,661 people. The number of the physical disability is 616,387. The Mentally Disabled is 402,817. The Deaf there are 472,855. The Blind there are 1,780,204. The difficulty of taking care of yourself is 170,120. Multiple Disabilities there are 2,401,592. The rest are other defects. In social interaction, persons with disabilities still experience many social exclusion problems that are still considered burdens and objects.

In Law No. 8 of 2016 concerning Persons with Disabilities article 1 formulates that the boundaries of persons with disabilities are any person who experiences physical, intellectual, mental, and / or sensory limitations in the long term that in interacting with the environment can experience obstacles and difficulties to participate fully and effectively with other citizens based on equal rights.

II.2 Joyful Learning in Mathematics

Singh (2014) and Wei (2011) wrote the learning that makes the learning environment useful and enjoyable for students (Joyful Learning) will improve students' thinking power for the better. Whereas Rätty *et al* (2016) stated that teachers and students need to be equipped with knowledge that must be in accordance with the latest needs, including providing props that make joyful learning. If what is faced is CwD in ES who

experience difficulties in learning mathematics, then joyful learning in mathematics needs to be created by the teacher.

The learning process or learning experience can make ES students or in inclusive schools feel happy. Conklin (2014) also examined that a pleasant perception of learning turned out to have a positive influence on student motivation.

II.3 Learning Media

Papanastasiou *et al* (2018) wrote that media are various types of components in the student environment that teachers can use to motivate students in learning. Teaching aids in learning mathematics is part of the learning media. While the position of teaching aids is related to the components of teaching methods and is one of the efforts to enhance the process of teacher and student interaction in the learning environment.

Government Regulation Number 19 of 2005 Article 42 (1) stated that every education unit including ES must have facilities which include educational furniture, educational equipment, educational media, books and other resources, consumables, and other equipment needed to support the process regular and continuous learning. It is clear that teaching aids which are one form of educational media are part of the facilities that must be owned by every education unit, especially in extraordinary schools. Learning activities that use teaching aids are very meaningful for students' learning success.

It is hoped that by using learning media that students can see or feel, students can express by thinking directly about the object they are learning. Thus, abstract concepts in mathematics that are being studied can settle, stick to, and last in the minds of students. In the 2013 Curriculum teacher's book, it was explicitly written that teachers were advised to use alternative media or learning resources available in the school environment, such facilities could be people, materials, or events.

II.4 Media of Three Dimension

Based on the preliminary survey, the difficulty of ES teachers in teaching mathematics is caused by the limited availability of learning media including effective and joyful learning in mathematics through using of teaching aids for students at school. According to Crane *et al* (2017), learning media can improve the quality of learning. Thus, efforts to learn mathematics that are innovative and joyful learning for CwD, one of them is the need to find a mathematics learning media in the form of Three Dimensional Learning Videos.

Three Dimensional Learning Video, is a teaching video equipped with narration and sign language systems. The use of three-dimensional video, is expected to help CwD to concretize abstract mathematical objects in a fun way. The stages of this activities are the mathematics

teaching aids that have been made by the Team of Researcher, then are equipped with narrative instructions, and sign language systems.

The sign language systems that made based on the sign dictionary for Indonesian deaf has been started since 1989. In its development in 2002, the Ministry of National Education Curriculum Development Center had compiled the Indonesian Sign Language System (SIBI) dictionary design. This sign language system serves as an addition to the instructions for using of the learning videos.

III. METHODS

To overcome the above problems, the method offered is through the empowerment of teachers in the Salatiga City special education school cluster through training activities and mentoring of innovative mathematics learning assisted by three-dimensional video teaching aids, namely learning videos that are equipped with narrative and sign language systems. The solution framework is as follows. Stages of its activities: (1) The research team designed and made a prototype of the Mathematics Teaching Aids in the form of instructional videos that were equipped with narrative instructions, and sign language systems. (2) "Alpha Production" Industrial House Partner makes prototype teaching aids to be good and ready to be used in ES. (3) Three Dimensional Video media was tested on State Extraordinary School of Salatiga. (4) Conducting interviews with teachers. (5) Conducting interviews with students. (6) Triangulate and draw conclusions.

IV. RESULTS AND DISCUSSION

IV.1 The initial activities.

The initial activities are as follows. (1) The research team has designed and made a prototype of Mathematics Teaching Aids in the form of instructional videos that are equipped with narrative instructions, and sign language systems. (2) "Alpha Production" Industrial House Partner completes the manufacturing of teaching aids prototype to be good and ready for use at ES. (3) Three Dimensional Video media was tested on State Extraordinary School of Salatiga.

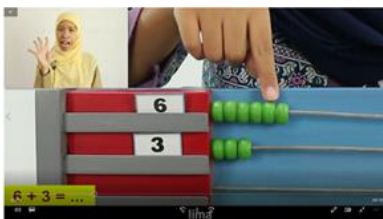


Figure 2: Product of Mathematics Teaching Aids based on Three Dimensional Video

A prototype photo of the Mathematics Teaching Instrument in the form of a learning video with narrative instructions, and a sign language system is as shown figure 2.

IV.2 Improving Teacher Skills in Mathematics Learning at ES

There has been an increase in the skills of ES teachers in utilizing Three Dimensional Video in Mathematics learning. To improve teacher skills in utilizing the Three Dimensional Video in Mathematics learning, the following activities were carried out. (1) Training is held on how to make a Three Dimensional Video. (2) Training in the use of three-dimensional video-based mathematical teaching aids in mathematics learning. (2) Demonstration of mathematics learning utilizing three-dimensional video-based mathematical teaching aids. (3) Observe the way the teacher utilizes three-dimensional video-based mathematical teaching aids in the classroom. (4) Observe the way students learn through the use of three-dimensional video-based mathematical teaching aids in class. (5) Interviewing with students. (6) Interviewing with teachers.

IV.3 The Skills of ES Teachers in Developing Joyful Learning

The skills of ES teachers in developing joyful learning assisted by the Three Dimensional Video teaching aid are increasing. To enhance or develop joyful learning assisted by the Three Dimensional Video teaching aid, a series of activities has been carried out as follows. (1) Held training in how to grow fun mathematics (joyful learning) for ES students. (2) Training in the use of three-dimensional video-based mathematical teaching aids. (2) Demonstration of growing joyful learning mathematics through the use of three-dimensional video-based mathematical teaching aids. (3) Observing the way the teacher grows fun mathematics for CwD through the use of three-dimensional video-based mathematical teaching aids in the classroom. (4) Observing the way of making joyful learning for ES students through the use of three-dimensional video-based mathematical teaching aids in class. (5) Interviewing with teachers. (6) Interviewing with students.

IV.4 Discussion

In general, the teachers who were the subjects of this study already had teaching experience and made lesson plans well. However, because not all teachers can pour their ideas into written language, the ideas put forward for writing lesson plans that contain the use of three-dimensional video are unclear and less sharp. It might be that the ideas that are in the minds of the teachers are good, but because the writing is unclear the results do not yet appear operational. In addition, some teachers are not skilled enough to grow joyful learning in mathematics for ES students through the use of

three-dimensional video-based mathematical teaching aids. Possible causes are as follows. (1) The teacher has not experienced in making RPP assisted with Teaching Aids, especially with three-dimensional video. (2) There has been no in-depth training for ES teachers on growing joyful learning in mathematics for ES students through the use of three-dimensional video-based mathematical teaching aids.

Push Factors

The push factors for this activity are quite a lot. Teachers and students are very enthusiastic to help foster fun mathematics for students through the use of three-dimensional video-based mathematical teaching aids. Learning can be done well. Other pushing factors that can lead to the success of community service activities are as follows.

First, the attendance of teachers and students on time. There are no teachers who are permitted to leave learning activities. So, the teachers in participating in all these activities were very enthusiastic. Second, the questions that arise from the teachers are quite a lot, both about learning models, lesson plans and how to grow joyful learning for students through the use of three-dimensional video-based mathematical teaching aids. The teacher's interest in teaching practice, making lesson plans, and how to grow mathematics is fun for students through the use of three-dimensional video-based mathematical teaching aids as well. Third, the independent assignments are carried out seriously by the teachers, namely preparing lesson plans and doing assignments.

Inhibiting Factors

The inhibiting factors that can affect the smooth implementation of learning are as follows. (1) The teacher's teaching schedule is very tight so it is rather difficult to set the observed learning practice schedule. So, this activity is carried out every week 1 to 2 meetings in class. (2) Semarang to Salatiga's distance is quite far.

V.CONCLUSIONS AND SUGGESTIONS

V.1 Conclusions

Conclusions based on the results of its activities are as follows. (1) ES teachers are skilled in utilizing Three-Dimensional Video in learning Mathematics. (2) ES teacher's skills in developing joyful learning assisted by the Three Dimensional Video teaching aid are increasing.

V.2 Suggestions

Some suggestions, which are expected to be utilized in similar activities in the future are as follows. (1) Teachers need to be given the opportunity to develop their ideas, such as those related to the opportunity to develop the teaching aids specifically using video. (2) There needs to be supervision in carrying out ways of growing fun mathematics for ES students through the use of

three-dimensional video-based mathematical teaching aids, so that teachers are not mistaken.

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