Need assessment developing multimedia interactive learning of geometry as instructional media

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Abstract. Multimedia Interactive learning is a learning media that combines sound, visual and text elements and can interact with users. This study aims to obtain information about the development needs of interactive multimedia learning material building space and learning media formulations that need to be developed in mathematics learning material building space. The study was conducted in the form of teachers needs assessment instruments which were analyzed using qualitative descriptive. The results showed that the use of learning media as a learning resource in the mathematics learning process had been carried out in the field, but the implementation was not optimal, that are: 1) there were obstacles in the delivery of material, especially material that could not be directly observed, 2) building material including material that difficult in delivery, the teacher needs media that can visualize the building of space for fifth grade elementary school and explain in detail and correct the types of building space so that there is no misunderstanding of students in mathematics building material, 3) the format favored by children are games and tutorials.

1. Introduction
Mathematics has a very important role in supporting the progress of science and technology [1]. In addition, mathematics is one type of knowledge that humans need in carrying out their daily lives. Therefore, mathematics began to be learned from early childhood through college. [2] states that mathematics is "important" as a human effort in helping the development of other ideas, connecting ideas with one another, both between mathematics and in other sciences. However, it cannot be denied that many students consider mathematics to be a difficult subject [3]. This can reduce the interest in learning mathematics. Excessive anxiety over material that can be anxiety. Mathematical anxiety can improve student performance in solving mathematical problems [4] which results in the development of student motivation. Mathematical anxiety has increased one of the main psychological factors that can improve student learning outcomes [4].

In learning, teachers must pay attention to the characteristics of students from the material to be taught. One of the subject matter of mathematics which is considered difficult for students is geometry [5]. Geometry is a part of geometry that emphasizes the ability of students to identify points, straight lines, drawing fields, spaces, spatial drawings and relationships between them [6]. Geometry is a part of mathematics related to student life, because almost everything around it is geometry [7]. Geometry is also called a three-dimensional that has space and is limited by sides. Geometry consists of cubes, beams, triangular prisms, rectangular pyramid, tubes, cones and balls. Where each geometry has a different formula for surface area and volume. By studying geometry, students can identify shapes and
spaces around them [8]. The main purpose of learning mathematics is to enable students to solve problems in everyday life [9].

One solution to overcome this problem is to create a technology-assisted learning environment [10]. In line with that, one of the education policies set forth in the Minister of Education and Culture Regulation No. 23/2013 is to improve the quality of national education. Various efforts to improve the quality of education have been and will continue to be carried out [11]. These efforts include providing various facilities and infrastructure in schools.

The development of technological innovation has become an inseparable part of the world of education. The existence of technological support in the field of education, increasing teacher productivity and involving students when teaching and learning activities [12]. The role of technology can accelerate, simplify, and expedite the process of planning, implementation, and evaluation in learning. Learning media can be interpreted as an intermediary to deliver learning messages from the source of the message to the recipient of the message so that mutual interaction occurs [13].

Computer-based learning media application uses a combination of several media referred to as "multimedia". Multimedia is defined as technology that optimizes computers as media that display text, sound, graphics, video and animation, integrated and interactive. Interactive is a component that must be present in multimedia [13]. Multimedia has an important role in the learning process. The use of multimedia significantly influences students' positive learning attitudes and increases motivation and independent learning experiences for students [14]. In addition, the application of multimedia learning is very helpful in the learning process with an illustration that can facilitate students learning subject matter. Multimedia interactive learning allows for interaction between the user and the media, so the delivery of material is not one-way and the user is not passive during the learning process [13]. The presentation consists of several media elements, namely audio, visual, material, and video with special menus to bring up information in the form of audio, visual and other features that can be accessed by users [15], so students not only can hear and see, but give active response.

Multimedia is defined as a combination of various media, such as text media, graphics, animation, audio, images, and video [14]. The text here is intended to be in the form of writing to clarify and reinforce the description of the material presented through visuals and sounds. In addition, the text serves to assist students in remembering learning material both currently and has been learned. Audio is the sound in the form of people's voices, animal sounds, wind sounds, water sounds, lightning sounds and other natural sounds. The sound here can also be in the form of music, instrumental, story, dialogue and other sounds in the form of sound effects. While the picture or visual here can be in the form of actual images such as photographs of original objects and films or videos. Visuals can also be animations, graphics, charts, and other illustrations. Both text, audio and visual function to clarify and reinforce the description of the material, so that the description of learning material becomes easier to understand, remember and be interesting for students. Through the combination of several elements of the media student learning experiences become more meaningful. Multimedia has advantages, especially in conveying the message to make the material more clearly [12].

However, the use of technology-based media is still more supportive of administrative activities in schools or just as a means for students to learn how to operate computers. Based on data from the Center for Information and Communication Technology (Pustekkom) Ministry of Education and Culture (Kemendikbud), only 40 percent of non-information and communication technology (ICT) teachers are ready with technology. The data shows that 60 percent of non-ICT teachers are not ready with technology, which means more teachers are not ready for technology than those who are ready. In fact, when viewed from the capabilities, computers can be used as a means that can help improve the quality of education in schools.

Based on the description, the researcher wants to conduct this research in the framework of developing a multimedia prototype of interactive learning of building material to help learning activities in schools, especially in elementary schools. Besides this research is also needed so that the development multimedia interactive learning in accordance with the needs and demands in the field. Thus data and information will be obtained from students, teachers and principals about their need for multimedia
interactive learning in learning activities that are appropriate to be presented through multimedia
interactive learning.

There are several problems that want to be answered through this research. These problems include:

a) Are there any obstacles in delivering learning material
b) Does the material of geometry difficult in its delivery so that it requires the help of media
c) If multimedia interactive learning material is needed; what media elements are needed to attract students and their interests.

The purpose of this study is to obtain data and information about:

a) whether or not there are obstacles in delivering learning material;
b) difficulty in delivering material geometry;
c) If multimedia interactive learning material is needed; what media elements are needed to attract students and their interests.

This research will be very useful for researchers in developing multimedia interactive programs for learning activities. This means that the development multimedia interactive learning geometry that is developed properly according to needs in the field.

2. Methods

The study was conducted through a survey of respondents who were determined as samples. The population of this study were students, teachers and elementary school principals in Yogyakarta. While the sample was taken randomly. From the results of randomization, two schools were established, namely public elementary schools and Islamic-based private elementary schools, including Rejowinangun 1 Public Elementary School and Al Huda Islamic Elementary School. Each school was chosen by several respondents. Respondents in this study were principals, teachers and elementary / MI students. The method used for data collection is through interviews.

The study was conducted for approximately a month, which was between November and February 2019, with activities that included library studies on relevant issues, drafting of designs, reviewing and revising designs, developing instruments, collecting data, analyzing data, writing reports, exposing results research, and doubling and disseminating research results. The collected data was analyzed descriptively quantitatively, by giving a percentage to the results of the respondents' answers.

3. Results and Discussion

Data collection was carried out between the first week to the end of November 2018. Respondents in this study consisted of students, teachers and heads of SD / MI spread in 2 locations in Yogyakarta, namely: Rejowinangun 1 Public Elementary School and Al Huda Islamic Elementary School.

The findings that have been put forward can be put forward as follows: 1) Unlike the principal, a small number of teachers and students have never heard of the use of interactive multimedia learning in learning activities. For those who have heard they have an idea that what is meant by interactive multimedia programs is electronic media such as Video, VCD, DVD and others. While the principal and most other teachers, have heard about the use of interactive multimedia learning in learning activities. Therefore they argue that multimedia interactive learning is very necessary to support learning activities in schools; 2) Both teachers and students, most of them have never used interactive learning multimedia in learning activities; 3) After hearing the explanation of the use of interactive multimedia learning in learning activities, both teachers and students agree that interactive multimedia learning is very helpful in understanding the subject matter being studied; 4) All schools visited have had computer devices and projectors to present interactive learning multimedia; 5) Both teachers, students and principals state that they need interactive learning multimedia to support learning activities, especially for certain lesson lessons that do require multimedia interactive learning to support learning; 6) The most preferred format for presenting interactive multimedia programs is games and tutorials.

4. Conclusion

Based on the formulation of the problem that wants to be answered from this research and analysis of the results of the research, some conclusions can be drawn as follows:

1) Elementary school / MI teachers feel there are obstacles in delivering the material, especially for certain materials that do have to use media as learning aids,
2) space-building material is included in difficult material categories in
its delivery so media that are capable of visualizing the building space for grade 5 are needed so that there is no misunderstanding of students in mathematics subject matter, and 3) The format that students prefer to present multimedia learning interactive is Games and Tutorial. Other formats that are quite popular are Drill and Practice (practice questions), Simulation (for example, presenting artificial laboratories) and Encyclopedia (smart books).

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