Mobile Learning-Based Science Mathematic Story: Attracting Students Studying Interest

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Abstract— **This is a survey study using questionnaire as the data collecting method. This study involved 144 students of 4th grade in Banguntapan sub district and Sleman sub district, Yogyakarta province. Study result shows that: 1) the availability of learning media usage is still low to support learning process; 2) students need supporting media of natural science and mathematics learning; 3) the story about adventure packaged in a form of animation video can support students to study; 4) the high students' enthusiasm upon smart phone; and 5) students' studying interest by using media of Mathematic mobile learning –based science story.**

Keywords: science–math story, mobile learning, studying interest

I. INTRODUCTION

Technology advancement of 21st century has slowly changed the world. This advancement is considered from the innovation and sophisticated technology development which ease humans' life. Technology connects the world with no limit [1] so that it affect lifestyle, in term of working, socializing, playing and studying. All kind of information and various events occur are easily obtained from anywhere, anytime and by anyone. The effect of technology and information development currently has spread to various life aspects, including education.

The education conducted in elementary school is one attempt carried out to give knowledge and skill, building the character needed by students to life in the middle of society and to solve the problems in their surrounding environment. Elementary school is a basic education level conducted for 6 years. In its implementation, students are given the knowledge in term of subject material which has to be mastered. Those subjects are natural science and mathematics.

Science and Mathematics are subjects that contain facts, concepts, principles, and scientific laws that are carried out using certain methods and aim to be delivered correctly [2]. Natural science is a practical science because it is related to the environment around student everyday [3]. Science is important to be taught from an early age in order to produce a generation that is literate in science so that it is able to understand and adapt to phenomena and changes in surrounding environment. By studying mathematics, students can face the challenges of living in an increasingly competitive world through the practice of acting on the basis of logical, rational, critical, careful, honest, effective and efficient thinking. Mathematics is a constructed learning related to the delivery of mathematical concepts [4] and the tools of thinking in an organized manner [5]. Science and Mathematics are both related to one another. If natural science is known as learning related to nature. Mathematics is usually known as learning related to numbers. From this consideration, Natural Science and Mathematics can be integrated in the concept of Math-science. Math-science is a concept that was developed with the aim to teach Science and Math material to students in a fun way, so that natural Science and Mathematics can be tangibly beneficial in students' lives.

Natural science and mathematics subjects at the elementary school level require learning media in order to facilitate the teacher in delivering the material. However, the media used in schools are not optimal because in learning system most of teachers are still use pictures as media, or even do not use media at all. Students need supporting media to explore broader understanding so that their abilities can be further optimized. The efforts that can be made are to create an innovation of learning media according to the needs and characteristics of elementary school students and the advancement of technology and information in the environment around students. The selection of instructional media is done in order to create a meaningful, fun, attractive learning atmosphere, and makes children active in the teaching and learning process. Meaningful learning can be taken from a reading material that is read or something that is outside the student's self [6].

Story is one alternative reading material that can be given to students. Children's stories are stories written for children and talk about life with all aspects which affect them [7]. Through stories children can enrich intellectuals and build character and attitude. Therefore, children's stories can be used as a bridge to attract students' studying interest at a concrete

operational level. Interest is a high tendency towards activities originating from self-motivation. Student interest grows if students feel attracted to something they need or meaningful to learn. Students who have an interest in learning are more enthusiastic in following the learning process, collecting assignments on time, being careful in taking notes and understanding the lesson. In contrast, students who are less interested in studying will have learning difficulties. Student studying interest comes from internal factor and from external factor. One of external factors is learning media used by teachers in the teaching and learning process.

Mobile learning is learning activity that utilizes smart phone as a learning medium. The use of technology as a media is not only has an important role in the learning process [8], but also provides opportunities for students to engage in global learning [9] and can expose various skills related to their future [10]. Based on Jean Piaget's theory of cognitive development, elementary school age students are in a concrete operational period, where in this period students are still very dependent on tangible or concrete objects during the learning process. Therefore, contextual, integrated and creative learning system to improve students' cognitive abilities towards learning natural science and mathematics is needed. Lesson delivery through phenomenon close to students is one way of attracting students in learning natural science and mathematics. Thus, this study aims to analyze the need for developing mobile learning based science -math stories in elementary schools.

II. METHODS

A. Participants

The participants consisted of 144 students consisting of 69 male students and 75 female students. All participants were enrolled in 4th grade of state elementary schools in two sub-districts in the Yogyakarta Special Region Province, namely Banguntapan sub-District and Sleman sub-District.

B. Procedures

All participants were ordered to fill in a two-page survey of "student questionnaire" specifically designed for this study. The survey takes about 15 minutes for students to complete 10 questions. Question 1 asks students' responses whether they use supporting media other than textbooks to study natural science and mathematics. Question 2, asking about students' preferences toward listening and reading stories. Question 3 asks students' preference of adventure-themed stories. Question 4 asks the students' interest in learning natural science and mathematics using stories. Question 5 asks the students' interest in video, music and game media. Question 6 asks the student's interest in using a Smart phone, computer or laptop as a learning media. Question 7 asks the of students'

independence in learning by using a Smart phone. Question 8 asks the use of smart phones in students' daily life. Question 9 asks about students' interest in learning by using a smart phone. Question 10 asks about students' interest in learning by using math-science stories through smart phones. After completing the questionnaire, all students were awarded ballpoint pens. The questionnaire data collected was then analyzed using descriptive statistical analysis techniques.

III. FINDINGS AND DISSCUSION

A. Findings

The results of the questionnaire percentage analysis in this study are shown on the following table.

TABLE I.   STUDENTS' QUESTIONNAIRE PERCENTAGE

Item	Persentase			
	SS	S	TS	STS
1	31,25	40,28	19,44	9,03
2	47,92	37,50	12,50	2,08
3	52,78	35,42	9,03	2,78
4	43,75	31,25	16,67	8,33
5	38,19	31,94	16,67	13,19
6	35,42	38,19	15,97	10,42
7	31,94	31,94	24,31	11,81
8	31,94	41,67	17,36	9,03
9	26,39	50,69	13,19	9,72
10	39,58	29,86	21,53	9,03

Note:
SS   = strongly agree
S   = Agree
TS   = Disagree
STS = Strongly disagree

The findings of item number 1 in the table show that the majority of students (40.28%) agreed that learning natural science and mathematics is more enjoyable when there is another media instead of only text books. In this finding it is known that both male and female students have the same percentage of 20.14% each. This identifies that both male and female students agree with the statement that learning natural science and mathematics is more interesting if the media used are not only books.

Based on item number 2, it was found that the majority of students (47.92%) consisting of 20.83% male and 25.69% female strongly agree that they like to hear and read stories. This data shows that female students tend to prefer this activity compared to male students.

This is also supported by other findings in item number 3 that the majority of students said they really like reading adventure-themed stories (52.78%) consisting of 25% male and 27.78% female.

The findings are also complemented by the findings in item number 4 which states that the majority of students (43.75%) consisting of 20.83% male and 22.92% female were very interested in

learning natural science and mathematics in the form of stories. This finding also shows that female students have a higher percentage of interest in stories that package natural science and mathematics material compared to male students.

The findings in item number 5 state that the majority of students (38.19%) were interested in video, music, story, and game media.

These results are also in line with the findings in item number 6 which states that the majority of students (38.19%) consisting of 20.14% male and 18.06% female agree that they are more interested in learning natural science and mathematics using laptops, computer or smart phone. This finding also shows that male students are more interested in learning to use laptops, computers, or smart phone compared to female students.

This is strengthened by the findings in item number 7, in which the majority of students admit to strongly agree (31.94%) and agree (31.94%) that they can learn independently using a smart phone. The majority of students who strongly agree consisted of 22.22% male and 9.72% female, and those who said they agreed consisted of 19.44% male and 12.50% female. This percentage can be seen that male students claim to be more able to learn independently using a smart phone compared to female students. This is in line with the findings in item 6: male students are more interested in learning to use laptops, computers, or smart phone compared to female students.

The finding that male students tend to be more interested in learning to use a smart phone is also supported by the findings data in item number 8 and number 9. Based on the findings in item number 8 it is known that the majority of students (41.67%) consisted of 22.22 % male and 19.44% female said that they agree that in their daily lives they operate smart phone more often. This was also strengthened by the findings of item number 9 which showed that the majority of students (50.69%) consisting of 28.47% men and 22.22% women claimed to agree that they were more interested in learning by using smart phone than books.

This finding was also strengthened by the findings in item number 10 which stated that the majority of students (39.58%) consisted of 20.83% male and 18.75% female who claimed to be very interested in learning natural science and mathematics in the form of stories. using a smart phone. This finding shows that the percentage of male is higher than female. This finding can be related to findings in items number 6, 7, 8 and 9 which state that male students tend to like learning by using smart phone.

B. Discussion

It is known that the implementation of the 2013 curriculum in elementary schools have been implemented thoroughly. The 2013 curriculum is unique in that it is integrated lessons called thematic learning. This requires the teacher to be more creative, both when preparing learning experiences for students, and in using the media. Learning media are inseparable needs in the teaching and learning process. The teachers need learning media to facilitate their task in delivering teaching material. However, the learning media used by most teachers were pictures in delivering the material, and some teachers even do not use the media at all. It was due to the limited time and ability of teachers to develop media which is suitable for the characteristics of fourth grade elementary school students. The selection of learning media is important in increasing learning interest. Some of the benefits of using media in the learning process are: 1) teaching will attract more attention of students, 2) the material is more clearly meaningful, so that the material provided is easy to understand for students, 3) the method of learning used is more varied, 4) students are doing more learning activities such as observing, doing, demonstrating and other activities [11]. Based on these benefits, it can be concluded that the learning process is more optimal if the learning activities not only use text books or picture media, but also use other supporting media for students' learning success.

The use of supporting media as a tool in helping teachers deliver material to students is still not used optimally so that the learning process cannot be carried out effectively and efficiently. In addition, the use of technology facilities provided by schools such as LCDs and computer labs was not maximal. LCD was only used several times, as well as computer labs only used when students were learning ICT. The use of media in classroom is a necessity. It is understandable because the learning process relying on various activities to add knowledge for the present and the future life. In accordance with item 1 in the table it can be seen that 31.25% of students strongly agree to study science and mathematics using media other than textbooks. The media used can place students to interact directly with learning material, so that media development needs to be adjusted to the learning objectives to be achieved, student characteristics and also the character of the material to be delivered [12].

Item number 2 in the table shows that 47.92% of students like listening and reading stories. Listening and reading stories, help students understand their world. This is in line with the opinion of Taro [13] that "the world of children is a world that should be filled with activities of playing, listening to stories and singing". Children's stories are simple and complex stories intended for children. Characteristics of children's stories as follows: 1) it is made to be

enjoyed by children, 2) the theme and material of the story is suitable with children's life, 3) the language used is simple and easy to understand, 4) the conflict presented provides lessons for children's life, and 5) contains moral values and educational value for children [14]. Based on these characteristics, children's stories are not limited to children's world or life, the world of adolescents and adults can also be told, but it must be presented based on children's perspective. In addition, the stories in children's stories are not only about humans, the world of animals and plants can also be portrayed in children's stories.

The findings in item number 3 show that 52.78% of students really liked the adventurous story. The theme of the story favored by children at the stage of concrete operational development is the story of real things that are peppered with a few imaginary stories, including adventure-themed stories. Therefore, science stories are made in the form of adventure stories with simple language, making students interested in learning science and mathematics material. Science stories are a form of reading that contains natural science and mathematics lesson that can serve as a bridge to foster student interest in learning. The material contained in the story can be easily absorbed by students. Student interest in learning natural science and mathematics using stories was also shown in the percentage of students who answered very interested as 43.75%.

Students' absorption and memory of natural science and mathematics lesson can significantly improve if the process of obtaining information initially through the senses of audio and visual. In other words, students can feel a more meaningful learning experience if the information received by students is in verbal form such as stories that are combined with information in visual form such as animation. Item number 5 shows the percentage of students who are very interested in video, music, stories and games was 38.19%. It shows that the video animation is something that is familiar in student's life. Science and mathematics material in the story can also be visualized in the form of animated videos. The image contained in the animation can function as a support as well as to deliver the contents of the story. The use of animation in learning can attract students' attention if it is used appropriately [15]. Animation also has a role in learning that utilizes technological development by giving children learning experiences that balance each other between complex images and simulations. It also can stimulate the imagination through the content of the story so that it gives a deep impression on children [16]. Animation can stimulate the imagination through the content of the story so that it gives a deep impression on children.

In the current era, it cannot be denied that technology has attracted a lot of attention in various social segments. One technology that is highly developed in human life is a smart phone. Apart from being a communication tool, smart phone can also be used to watch videos, read news, play games and have other activities. The number of uses of this smart phone makes various age segment including children interested in using a smart phone. The high level of student attention to smart phone can be an opportunity for teachers by utilizing smart phone as a medium in the teaching and learning process. Based on the results of the table in item 6 it shows that students are very interested in using a smart phone, computer or laptop as a medium of learning.

However, in the use of smart phone students have not used the smart phone as a learning resource or as a supporting media in learning. Students use smart phone only as entertainment media such as playing games, watching videos, accessing social media, and communicating. The use of smart phone as media is developed through android applications with content liked by students as well as interesting stories, animated videos, and games. Learning by using a smart phone is more practical because it can be done by anyone, anywhere and anytime and at a more affordable cost.

Mobile learning is a form of learning that utilizes technology and especially digital media that are able to process, package, and display and disseminate information relating to learning both audio, visual, audio visual so that it becomes more interesting. Regarding students' interest in stories and mobile learning media, it was found that as many as 39.58% of students said they were interested in using science learning media based on mobile learning as media during learning. Science learning based on mobile learning is a learning media that utilizes technology as a media for supporting student in learning integrated with an android application. This application includes natural science lesson with interesting visualizations in the form of stories that are packaged in the form of animated videos. The media developed in this study uses devices such as smart phone, laptops, computers and other technological devices that can be used without being limited by distance, place and time by anyone who needs it.

IV. CONCLUSION

Media in learning is an alternative way to stimulate student interest in learning. The results showed that students at the concrete operational stage had an interest in adventure stories containing science and mathematics subject matter which were outlined in the form of animated videos which were then developed through an android application.

The learning process that takes place in class requires learning media that are interactive, independent, effective, efficient and up to date upon the development of technology. Therefore the in

developing learning media the following factors should be considered, those are: 1) The delivery of material is interactive and contextual for students through children's stories; 2) it can visualize real objects through animated videos; and 3) it is practical and can be accessed anytime and anywhere to attract students 'learning interest and help improve students' understanding of natural science and mathematics subjects.

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