Storytelling on Toraja Carving in Geometry Learning

Perdy Karuru(✉), Yulianti Para'pak, and Theresyam Kabanga'

Universitas Kristen Indonesia Toraja, Tana Toraja, South Sulawesi, Indonesia
perdykaruru8@gmail.com

Abstract. Toraja engraving is rich in mathematical concepts, especially geometric concepts such as points, angles, lines, flat buildings (squares, rectangles, triangles, and so on). Each carving has its own history that can be told to children, in addition to attracting their attention, it also introduces Toraja culture from an early age. This study aims to determine the improvement of geometry learning outcomes of grade VII students of SMP Negeri 4 Sesean in learning using Toraja carving media with storytelling techniques. This type of research is a class action study that is carried out in two cycles and each cycle consists of two meetings. Data collection techniques use observation of learners' activities during learning, field notes, and learning outcomes tests. Data analysis using qualification and quantitative. The results showed that there was an increase in student geometry learning outcomes through the use of Toraja carving media with storytelling techniques where in the first cycle of 24 students who completed their learning 65% and in cycle II it increased to 90% with very good theory. This data shows that the second cycle has met the success indicators so that it can be concluded that learning improvements using Toraja carving media with storytelling techniques can improve the geometry learning outcomes of grade VII students of SMP Negeri 4 Sesean.

Keywords: Geometry · Storytelling · Toraja Carving

1 Introduction

In accordance with The Law of the Republic of Indonesia number 20 of 2003 concerning the National Education System, it is explained that national education functions to develop abilities and form a dignified national character and civilization in order to educate the nation's life, and aims to develop the potential of students to become human beings who have faith and piety in God Almighty, have a noble character, healthy, knowledgeable, capable, creative, independent and become a democratic and responsible [1]. To achieve this goal, in order to form a national character, the implementation of education is organized systematically.

Education is a forum that can build a new generation of a better nation in various aspects [2]. On the other hand, educational practice in Indonesia still tends to focus on the main results of education in quantitative terms only, such as: national exam results,

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final semester exam results, daily test results, and so on, in terms of educational results can also be seen from a qualitative point of view which includes: faith and piety to God, noble character, honesty, responsibility, courtesy, and so on.

Schools as a forum in the learning process have a very important position in the world of education. Therefore, education in schools plays a very important role, namely in order to realize optimal national education as expected so far. Learning in schools teachers play a major role in creating an interactive situation such as interaction between teachers and students, students with students and media/learning resources that can support the achievement of learning goals [3].

In learning in schools, learning tools/media/resources are needed as a tool to express opinions, ideas, provide information or receive information. Based on the above, researchers chose Toraja carvings as a medium for delivering geometry material whose delivery uses storytelling as a strategy in improving geometry learning outcomes for 24 Sesean State 4 Junior High School students.

Based on the results of preliminary observations in class, it was found that there were still low results in learning mathematics for students, especially for geometry material. And the results of the observation of activities carried out in the classroom, teachers are still lacking in carrying out varied activities in learning activities. The importance of activities that can arouse learners' curiosity, sensory experience and exploring ideas will be able to increase the motivation of learners in learning activities.

Storytelling is a more systematic strategy of transferring stories, namely from the narrator to the listener [4, 5]. Whitehead suggests that storytelling is an event both real and imaginary that has been conceived to be conveyed or shared with others. Storytelling means emphasizing the narrative that someone told others about an event or occurrence [6]. Similarly, Jennings explained the meaning of storytelling, which is an art that is not limited by time and culture. Storytelling is also a tool for conveying knowledge, feelings, thoughts and ideas.

Collin assert that storytelling has many uses in the education of children [7]. She concludes that stories provide a conceptual framework for thinking, which allows children to shape the experience into a whole that they can understand. Stories cause them to be mentally experienced in seeing the images in their heads.

Joseph Campbell, an academic who researched stories from around the world in his compilation of lectures in the 80s "transformation of myth through time" said that stories become very rich and full of messages and life lessons that can be modified according to needs [8].

From some of the opinions that have been mentioned, it can be concluded that stories have many functions, including: as entertainment or solace, educators, means of passing on values, social protests, and also projections. The most important thing in storytelling activities is the process. In this storytelling process, there is an interaction between the storyteller and his audience (in this case children). Through this storytelling process, communication can be established between the storyteller and the audience, because this storytelling activity is important for children, the activity must be packaged in such a way that it is interesting, so the stages in storytelling are needed [9]. The techniques used in storytelling and who are the parties involved in storytelling activities also determine whether the storytelling process is smooth or not.

Around children, there are many media that can be used to deliver teaching materials. Local wisdom integrated into learning will make the learning meaningful. As Matang argues that the integration of culture into the formal mathematics curriculum is one way to overcome students' learning difficulties [10].

The medium used is toraja carving, especially in introducing flat wake. Moreover, children really like to listen to stories because of that stories can attract children's attention to learning. Stories, well told can inspire an action, help the development of cultural appreciation, emotional intelligence, expand children's knowledge, or simply cause pleasure. Listening to stories helps understand their world, and how they relate to others. Toraja carving is a child's daily life that can be used as a medium to teach flat building through storytelling. Stories about the history of toraja carvings will attract children's attention/enthusiasm for learning so that it will be easier to introduce geometric concepts, especially flat buildings contained in the carvings.

Toraja carvings are rich in mathematical concepts, especially geometric concepts, such as points, angles, lines, flat buildings such as squares, rectangles, triangles, and so on [11]. Each carving has its own history that can be told to children, in addition to attracting their attention, it also introduces Toraja culture from an early age. Here are some of Toraja's carvings that are used as media in learning geometry with storytelling techniques [12, 13], namely:

1. **Pa'barreallo carving**

Barre in Toraja means round or round. Allo means sun. So pa'barreallo is a round carving resembling the sun. The sun gives life. In Greek mythology for example we know there is a sun god. Pa'barre allo is placed in the traditional house section of Toraja and Lumbung leaning forward (longa). On it is placed pa'manuk londong (rooster carving) Pa'barreallo is the epitome of greatness. Build flats of this size: circles, rhombuses, triangles, and rectangles.

2. **Pa'bombo uai carving**

Pa'bombo uai is a carving that resembles a water animal (anggang-anggang) that can move through water smoothly and very quickly. The meaning of this engraving is to be smart in this life in this case to be agile, dexterous, fast, and precise. In addition, this carving also means that humans must have sufficient skills and abilities in carrying out tasks and responsibilities. The flat builds contained in this engraving are circles, triangles and rhombuses (Figs. 1, 2 and 3).

Fig. 1. Pa'barreallo carving

Fig. 2. Pa'bombo uai carving

Fig. 3. Ne'limbongan carving

3. **Ne'limbongan carving**

The Ne'limbongan engraving is essentially a circle bounded by a square, this engraving depicts the four main cardinal directions believed to be the source of sustenance. Limbongan means a spring that never dries up that can give fresh life to nature and humans. The carving symbolizes that the Toraja people are determined to obtain sustenance from the four directions of the cardinal like springs united in a lake and give happiness to posterity in the future.

4. **Pa'kangkung carving**

The meaning of this carving philosophy is for man to dedicate himself not only to himself but to the people around him. As the name suggests, this carving resembles the tops of kale leaves. The meaning of this motif is that humans can be healthy, have cheap fortune, and be useful to others just like kale vegetables that can be healthy for the norang who consume them. The flat builds contained in this engraving are circles and rhombuses.

5. **Sekong dibungai carving**

This engraving resembles an equilateral quadrangle whose ends are hidden in the middle and the frame is usually given a triangular or semicircular motif. It means that in this life there are things that must be kept secret from the interests of others, family and society. The flat builds contained in this engraving are triangular and square [14] (Figs. 4 and 5).

Fig. 4. Pa'kangkung carving

Fig. 5. Sekong dibungai carving

2 Methods

This type of research is Class Action Research which consists of two cycles that are carried out in stages. The stages in each cycle are: (1) action planning, (2) implementation of actions, (3) observation, and (4) reflection. The execution of these actions is carried out in repeated cycles. Each implementation is carried out in accordance with the steps of the activities in the RPP. For the action and observation stages, it is a unity because the two components are two inseparable activities. The Action Model used is to adopt Kemmis and Mc Tanggart [15].

The data collection techniques used in this study were observation, interview and documentation. Data analysis in the form of quantitative data analysis and qualitative data analysis. Quantitative data analysis in the form of observations of student activities and geometry learning outcomes in the form of data tables and graphs. Meanwhile, qualitative data analysis is carried out by reducing data, displaying data and drawing conclusions.

3 Results and Discussion

This class action research was carried out on grade VII students of SMP Negeri 4 Sesean with a total of 24 students. The study was conducted through two cycles, and each cycle consisted of two encounters.

1) **Learning Activities**

In accordance with the learning that was carried out thoroughly at meeting I and meeting II for grade VII students of SMP Negeri 4 Sesean using Toraja carving media with Storytelling techniques, there was an increase in student learning activities during

Table 1. Student activity improvement data

Student Activities	Before Action	Cycle I	Cycle II
Being courageous to propose ideas	16,67%	50%	87,5%
Being brave to ask questions to the teacher/friend	25%	58,33%	79,17%
Engaging in a discussion with friends within their group	25%	66,67%	100%
Telling stories through Toraja carvings about two-dimensional shapes	8,33%	33,33%	79,17%
Completing exercises	50%	83,33%	100%

mathematics learning for the subject matter of geometry. The increase that occurred was in accordance with the indicators used in this study such as: daring to put forward ideas / ideas, daring to ask teachers / friends about material that was not yet understood, discussing with friends in their group, and telling stories through the media of toraja carvings about flat waking up, and doing problems.

The data obtained by researchers on student learning activities from before the action to the action in cycle II are presented in Table 1.

Based on the data above, it can be seen that there is an increase in student learning activities after implementing instructional improvements according to the interpretation of observational data. The activity of students' courage to express ideas/given before the action was 16.67%, and after the first cycle, it increased to 50%, and in the second cycle, it reached 87.5% out of 24 students. The indicator of students' courage to ask teachers/friends before the action was 25%, and after the first cycle, it increased to 58.33%, and in the second cycle, it reached 79.17%. The aspect of engaging in discussions with friends within their group before the action was 25%, and after the first cycle, it increased to 66.67%, and in the second cycle, it reached 100% of the students. For the indicator of telling stories through Toraja carvings about two-dimensional shapes before the action was 8.33%, and after the first cycle, it increased to 33.33%, and in the second cycle, it reached 79.17%. Meanwhile, the aspect of students doing the questions before the action was 50%, and after the first cycle, it increased to 83.33%, and in the second cycle, it reached 100% of the 24 students participating in the learning process.

Based on these data, it can be concluded that learning using Toraja carving media with storytelling techniques can increase the learning activities of students of SMP Negeri 4 Sesean.

2) **Learning Outcomes**

Related to the results of learning geometry students according to learning using Toraja carving media with storytelling techniques carried out in first cycle and some improvements in second cycle showed improvement. Data on student learning outcomes in first cycle and second cycle are presented in Table 2.

Table 2. Student learning outcomes data

No	Indicators	Average score	
		First Cycle	Second Cycle
1	Average	58,20	84,08
2	Top Rated	82	100
3	Lowest Value	55	73
4	Level of Completion	65%	90%

Based on Table 2, it can be seen that of the 24 students who participated in learning an average score of 58.20 in first cycle and increased to 84.08 in second cycle with a high category, the highest score from a score of 82 (first cycle) increased to a score of 100, the lowest score from a score of 55 (first cycle) increased to a score of 73 (second cycle), and there were 65% of students who completed their studies and in second cycle increased to 90% who completed their studies.

4 Conclusion

Thus, it can be concluded that the application of Toraja carving media with storytelling techniques can improve the learning outcomes of geometry students in grade VII of SMP Negeri 4 Sesean.

Based on the results and discussion, it can be concluded that there is an increase in learning activities and learning outcomes of student geometry through the use of Toraja carving media with storytelling techniques where in first cycle of 24 students who complete their learning 65% and in second cycle it increases to 90% with very good theory. This data shows that in second cycle it has met success indicators so that it can be concluded that learning improvements using Toraja carving media with storytelling techniques can increase learning activities and geometry learning outcomes of grade VII students of SMP Negeri 4 Sesean.

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