TBLA Mastery of Mathematical Concepts Through TPS (Think Pair Share) Learning Model Aided by Conversion Tool Games

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A R T I C L E I N F O

A B S T R A K

Tingkat pemahaman konsep matematika yang masih rendah dikarenakan kurangnya penerapan model pembelajaran dan media yang mampu meningkatkan penguasaan konsep kepada siswa. Tujuan penelitian ini adalah mengungkap pola konstruksi penguasaan konsep matematika melalui model pembelajaran TPS berbantuan permainan alat konversi dengan menggunakan *Trancript Bassed Learning Analysis* (TBLA). Penelitian ini melibatkan siswa kelas 5 berjumlah 28 siswa. Pada penelitian ini terbagi menjadi 2 siklus yaitu siklus 1 berfokus pada materi konversi satuan panjang sedangkan siklus berkonsentrasi pada materi penjumlahan dan pengurangan konversi satuan panjang. Kegiatan dalam setiap siklus akan di rekam melalui video atau audio, kemudian rekaman tersebut akan dijadikan transcript dialog pembelajaran kemudian dianalisis dengan tipe reson komunikasi. Selain *analisis transcript* pada kegiatan terakhir siswa diberikan ujian tertulis melalui LKS (Lembar Kerja Siswa). Penelitian ini memperoleh hasil bahwa siklus I nilai rata- rata kelas mencapai 75,36, siklus II nilai rata-rata mencapai 78,93, dan nilai prosentase kelulusan mencapai 82%. Sehingga dapat disimpulkan bahwa penelitian ini terkait penguasaan konsep penjumlahan dan pengurangan konversi satuan panjang dinyatakan berhasil.

A B S T R A C T

The level of understanding of mathematical concepts is still low due to the lack of application of learning models and media that can improve students' mastery of concepts. The purpose of this study was to reveal the construction pattern of mastery of mathematical concepts through the TPS learning model assisted by conversion tool games using Transcript Based Learning Analysis (TBLA). This study involved 28 students of grade 5. In this study, it was divided into 2 cycles, namely cycle 1 focused on the unit length conversion material while the cycle concentrated on the material addition and subtraction of length unit conversion. Activities in each cycle will be recorded via video or audio, then the recording will be used as a transcript of the learning dialogue then analyzed with the type of communication reson. In addition to transcript analysis in the last activity students are given a written exam through LKS (Student Work Sheet). This study obtained the results that in the first cycle the class average value reached 75.36, the second cycle the average value reached 78.93, and the graduation percentage value reached 82%. So, it can be concluded that this research is related to the mastery of the concept of addition and reduction in the conversion of units of length which is successful.

1. Introduction

Curriculum 2013 has objectives that focus on the cognitive, affective and psychomotor domains. The 2013 curriculum is able to encourage students to develop attitudes, skills and knowledge in a balanced manner, besides that learning with the theme provides benefits for students, namely providing real experiences to students so that learning is more meaningful (Irawan, 2016; Sugiyanto et al., 2015). Through the implementation of the 2013 curriculum students not only receive teacher explanations, but students are required to actively explore their own knowledge from various things and students are required to be able to work together in groups (Fadliyatis et al., 2016; Subadi et al., 2013).

Meaningful learning is able to improve students' initial conceptual development starting from spontaneous concepts that students learn through cultural practices and daily experiences (Haniin et al., 2015; Perdana et al., 2018). Spontaneous means explaining concepts obtained from simple language through the phenomena that occur, so that the students' understanding is so simple that it only gives students a level of knowledge in concrete form and a low level of understanding. To improve higher abstract thinking, students need interaction with teachers who act as mediators in

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learning who are able to provide meaning and concept development for students (Hendrayana, 2017; Kirna, 2012).

But in reality, one of the learning contents that needs to be improved regarding understanding the concept is mathematics. The content of learning mathematics is a fun subject, but it is still considered a scary subject on any school exam. Learning is less valuable if it is collaborated with a learning model that focuses on teachers (teacher oriented). These facts and conditions are still being carried out in the learning process in elementary schools. This condition directly impacts on the creativity and activity as well as the fighting power of the students in following the lesson, which results in a very low level of understanding and mastery of material concepts. Therefore, it is necessary to have a learning model that needs to be applied to overcome these problems.

The cooperative learning model is very suitable for students because it will be easier to find and understand difficult concepts if they discuss with their friends, students routinely work in groups to help each other solve complex problems (Fardiansyah et al., 2019; Sariayu & Miaz, 2020). One of the cooperative learning models that is able to improve mastery of the concept of mathematics learning content is the Think Pair Share (TPS) learning model.

Think Pair Share (TPS) learning model is a type of cooperative learning model designed as an effort to influence the student interaction process. After presenting the material, students are expected to think about a task that is stated in more depth and then discuss the answer. This learning model requires students to work together and help each other in small groups of 2-6 students (Sanjaya et al., 2013; Sudirman, 2016; Suryani, 2013).

The Think Pair Share (TPS) type of cooperative learning model is a cooperative learning that is able to create an effective learning activity to vary the atmosphere of discussion patterns in the classroom in order to foster enthusiasm for learning in students. The steps of the Think Pair Share (TPS) learning model include three important stages, namely thinking, pairing, and sharing (Kurniawan et al., 2018; Triwulandari et al., 2017).

Basically, this learning model is student-centered, in which students are more active in seeking information. Students are more independent, not only relying on information from the teacher, but also the teacher has a role as a facilitator. Thus, the learning process in the classroom will be more meaningful. Think Pair Share is also a very good active learning, if implemented correctly, it will save the teacher's time in explaining, help students discuss and participate more, and provide a cumulative assessment of student progress (Fahrullisa et al., 2018; Ladimiyanto, 2014; Yoserizal & Rahmi, 2019).

The advantage of this TPS learning model is that the structure of this learning model provides equal opportunities for all students to jointly discuss their ideas and share with their friends. This discussion and information sharing activity is very important because students begin to build their knowledge in this discussion. In addition, this activity helps students to find out what they can do about something they don't know yet. This active process is usually not available to students which learning generally. Cooperative learning can increase both individual and classical learning activities and outcomes (Sanjaya et al., 2013; Tembang et al., 2020).

In addition, to support a more effective and fun teaching and learning process, it must be combined with teaching aids that are in accordance with the material in order to help students understand the concepts of the subject matter they are learning. Moreover, the learning objectives in the form of maximum results are more easily realized (Maharani et al., 2017; Nomleni & Manu, 2018; Sumarni, 2016). In line with this, (Wulandari et al., 2019) stated that teaching aids are learning media that contain or convey the characteristics of the concepts being studied.

The teaching aid used by the researcher is the teaching aid of the conversion concept in the form of a conversion tool game. The advantage of this tool is that students will be more active, not burdened with the material being studied and are game-oriented. Other advantages are: (1) the concept will be easy to understand and embedded in students so that it will always be remembered for a long time, (2) this teaching aid is also easy to make yourself with materials that are found in many school and student home environments, (3)) besides that, these props are given an attractive color to change the impression of students, if learning mathematics must be serious and focus on being more relaxed, effective and fun (Alawiah et al., 2018; Immawan & Alimuddin, 2017). In line with (Setyowati et al., 2016), that learning media can stimulate students in learning including duplicating real objects, making abstract concepts into concrete concepts, and providing a learning atmosphere that is not depressed, relaxed and attractive so that it can achieve learning objectives, namely understanding the concept of conversion in mathematics learning.

Creating effective learning requires a Think Pair Share learning model that can be assisted by conversion games, from learning about mastery of mathematical concepts. Then, the researcher

studied and analyzed it using TBLA analysis (Transcript Based Lesson analysis). The analysis process of TBLA (Transcript Based Lesson Analysis) in this study is to understand the characteristics of learning arrangements in one lesson hour which is divided into several cycles of activity to be analyzed. The knowledge construction pattern describes the development of students in building their own knowledge through class discussions on the length unit conversion material (Haniin et al., 2015; Rohaeti, 2012). In this construction pattern, the emphasis is on mastery of concepts resulting from interactions in the classroom. Therefore, learning practices such as discussions, experiments or performance can influence the construction of students' conceptual mastery.

Several relevant previous studies can be used to determine the novelty of this research with other research, such as: (1) research conducted by experts who obtained the results that the application of the Think Pair Share (TPS) learning model can improve mathematical comprehension skills, (2) research that done by experts (Setyowati et al., 2016) who get the results that by using teaching aids students become easier to understand the material and finally the learning outcomes obtained increase, (3) research conducted by experts (Suhartini, 2015) who obtained the results that the use of TPS learning model assisted by serial images can improve the skills of writing one-act drama scripts for students.

Based on the relevant research, the novelty of this study is to discuss the mastery of the mathematical concept of addition and reduction of unit length conversion through the Think Pair Share (TPS) learning model assisted by the conversion tool game using Trancript Bassed Learning Analysis (TBLA). The purpose of this study is to reveal the construction pattern of mastery of mathematical concepts through the TPS learning model assisted by conversion tool games using Transcript Bassed Learning Analysis (TBLA).

2. Research Method

Research design is a method used to collect research data, so that the research results can be proven. Researchers used analytical techniques to analyze data obtained from the research results. This aimed to obtain accurate data in accordance with the research objectives as well as the difficulties faced by students in mastering mathematical concepts with the Think Pair Share learning model and conversion tool games. The subjects in this study involved 28 students of SDN Bendo grade 5.

The data collection method used in this study was the Transcript Base Lesson Analysis (TBLA) quantitative method. This study focused on the learning transcripts made, learning artifacts and observations of the implementation of learning to see to what extent the influence of the Think Pair Share learning model and unit conversion tool games can improve the ability to master mathematical concepts in unit length conversion learning.

The research would be conducted using 2 learning cycles. Each learning consisted of 3 stages, namely design (preparation), implementation, and reflection. Each cycle would consist of a Think Pair Share learning model assisted by a conversion game tool. Conceptual pattern analysis was carried out at the implementation stage of learning, because this study was made to obtain an overview of the extent to which students mastered the understanding of mathematical concepts in the length unit conversion material.

Data from recording in the form of video and audio on the implementation of learning was used as the main data to analyze the mastery of mathematical concepts with the resonant type of communication that occurs in the mathematics learning process. In addition, researchers used the results of observations and tests as an option to strengthen the analysis carried out.

3. Result and Discussion

When the first cycle of learning took place, the researchers collected various learning artifacts either through video or audio and even written for further analysis based on the type of student response to find out the construction of students' knowledge in learning, so that a learning transcript was created.

The transcript that has been formed was then analyzed based on the type of communicative function response, for the analysis of the responses of students in learning mathematics in cycle I can be seen in Figure 1.
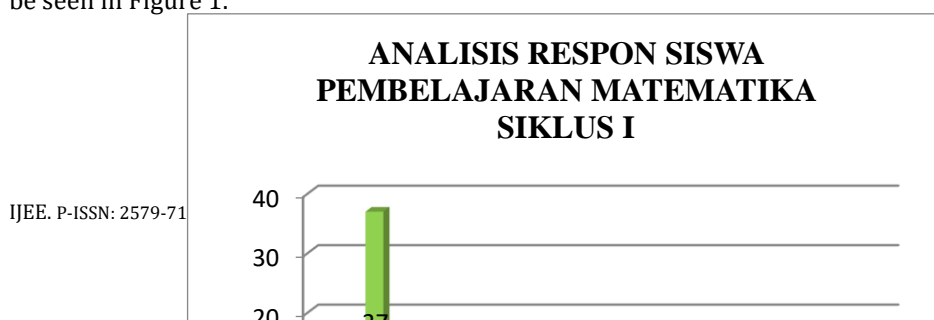
ANALISIS RESPON SISWA PEMBELAJARAN MATEMATIKA SIKLUS I

Figure 1. Analysis of Student Responses in Mathematics Learning Cycle I

From the transcript analysis above, it can be seen that the highest student response is code A (Responsive) where students are enthusiastic about learning so that they are able to answer the questions raised by the teacher. In addition, there is a more dominant response, namely EL (Elaboration) and J (Judgmental) where students begin to develop themselves with the information obtained in learning. From these data it can also be seen that students in providing suggestions, justifying suggestions and summarizing pieces of information are still relatively low so it needs to be facilitated by providing speaking opportunities according to wider learning topics so that students are sharper in critical thinking. This is supported by research from (Pantiwati, 2012) who obtained the results that the Think Pair Share learning model was able to foster students' critical thinking skills.

After analyzing cycle, I was about to analyze the concept of unit length conversion, then the researcher analyzed cycle 2 which contained the concept of addition and subtraction of the length unit conversion. Similar to what was done in cycle 1, namely collecting artifacts in the form of video, audio or chat was collected during learning in cycle 2. To find out the highest and lowest response codes in learning cycle II, it can be seen in the analysis of the responses of students in learning mathematics cycle II in Figure 2..
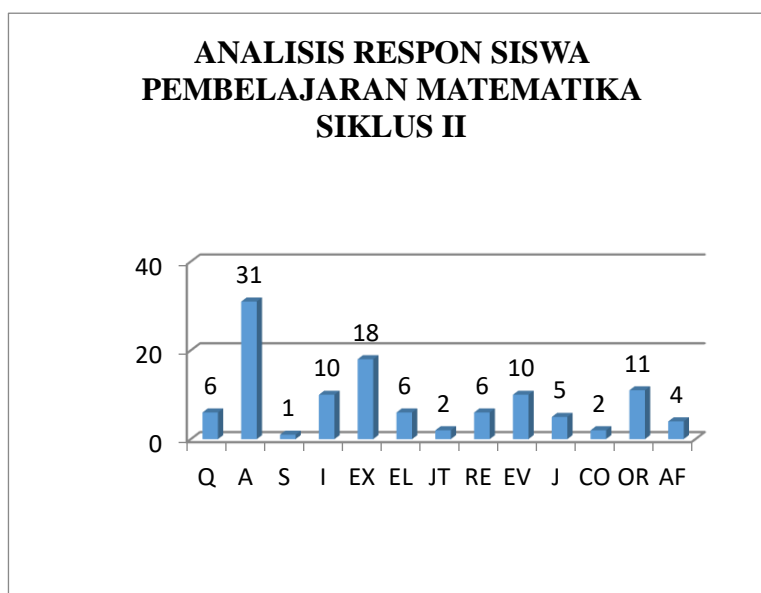
Figure 2. Analysis of Student Responses in Mathematics Learning Cycle II

From the diagram above, the 3 highest responses appear, namely Responsive (A), Exemplification (EX) and Originizing (OR) so it can be concluded that in cycle II learning students are more dominant in answering questions from the teacher, giving examples in real life and can control

themselves when doing presentations convey the opinion of the group. The diagram above the researcher also focuses on the 3 lowest student responses, namely suggestive (S), Justificational (JT) and Sumarizing (CO), of the three lowest student responses illustrates that learning in the cycle students have not been able to come up with ideas or ideas as suggestions related to the topic learning so that it impacts on confirming or criticizing the opinions of other groups and summarizes some of the information conveyed. This is supported by research from (Fahrullisa et al., 2018) who got the results that the TPS learning model can foster students' mathematical communication skills.

After the second cycle, the students worked on the worksheets to determine the level of completeness or the percentage of completeness. The results of the completeness percentage can be seen in Table 1.

Table 1. Completeness Percentage

No	Score	Total Student	Complete	Not Complete
1	10	0	0	0
2	20	1	0	1
3	30	0	0	0
4	40	3	0	3
5	50	0	0	0
6	60	1	0	1
7	70	5	5	0
8	80	5	5	0
9	90	4	4	0
10	100	9	9	0
Total			23	5
Percentage (%)			82	18

From the table above, the passing percentage value reaches 82%, so it can be said that this research is related to the mastery of the concept of addition and reduction of the conversion of length units to be successful. These results are supported by research (Rismayanti et al., 2020) who obtained the results of the study that the application of the Think Pair Share (TPS) learning model can improve the mathematical understanding ability of class VII-8 students of SMP Negeri 18 Bandung.

One of the cooperative learning models that is able to improve mastery of the concept of mathematics learning content is the Think Pair Share (TPS) learning model. The cooperative learning model is very suitable for students because it will be easier to find and understand difficult concepts if they discuss with their friends, students routinely work in groups to help each other solve complex problems. (Fardiansyah et al., 2019; Sariayu & Miaz, 2020).

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Based on the relevant research, the novelty of this study is to discuss the mastery of the mathematical concept of addition and subtraction of unit length conversion through the TPS learning model assisted by conversion tool games using Trancript Bassed Learning Analysis (TBLA). The implementation of this research, namely, the Think Pair Share learning model assisted by conversion game tools can be used to create effective and fun learning in the classroom.

4. Conclusion

From the research that has been done, namely analyzing the construction of students' knowledge in mastery of mathematical concepts using Transcripts Based Learning Analysis (TBLA), which research is divided into 2 cycles. Cycle I concentrated on mastery of the concept of length unit conversion assisted by the conversion tool playing media, while the second cycle focused on mastering the concept of addition and subtracting the length unit conversion which was assisted by the simple conversion tool game For mastery of mathematical concepts in cycle 1 and cycle 2 with the provision of student worksheets, the worksheets have reached a passing percentage value of 82%, so that the mastery of concepts in both cycles is declared successful and the Think Pair Share learning model is assisted by playing tools conversion can be used to create effective and fun learning in the classroom.

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