Didactic Design of Traditional Sundanese Culture-Based Snakes and Ladders Game as a Learning Media Using the CTL Model to Improve the Ability to Understand Mathematical Concepts in Integer Material in Grade VI SD

Sistya Fhirdhan Anjani· and Feni Melina Suandari

Universitas Pendidikan Indonesia, Serang, Indonesia

·20fenimelinas@upi.edu

Abstract

This research is motivated by the findings of learning barriers (learning obstacle) experienced by students in the material of positive and negative integers. These obstacles cause students' understanding of positive and negative integer material to experience obstacles. Therefore, a learning design must be designed that can overcome these learning barriers. Traditional game learning design of snakes and ladders based on Sundanese culture with the help of modelsCTL on negative positive integer material can be used to make it easier for students to understand positive and negative integer material, so that they can overcome learning obstacles (learning obstacle) experienced by students and can be used as learning media that introduces various kinds of local wisdom possessed by Sundanese culture. The purpose of this study is to describe learning barriers (learning obstacle) on negative positive integer material, didactic design of positive negative integer material for learning traditional snakes and ladders games, implementation of positive negative integer material design for learning traditional snakes and ladders games, and students' responses to the material didactic design for positive negative integers for learning snakes traditional games ladder. The method used is descriptive qualitative research with a research model (Didactical Design Research) DDR. Consists of three stages:prospective analysis, metapedadidaktic analysis, dan restrosfektif analysis.This research was conducted in three schools, namely SMPN 1 Pasirjambu, SDN Sayabulu, and SDN Perigi Baru. The results of this study are a learning design in the form of teaching materials in the form of LKS Student Worksheets and Learning Implementation Plans which were developed as alternative teaching material designs that can be used in learning material on positive and negative integers.

Keywords: didactic design, learning barriers, integers, traditional game of snakes and ladders.

A. INTRODUCTION

Didactial Design Research (DDR) is one of the educational research models introduced in Indonesia by Suryadi (2010), the theory he has developed is the Metapedadidactic Theory in mathematics learning. The model he developed is more emphasis on analysismetapedadidaktik, namely the teacher's ability to analyze the didactical triangle, which means that the learning process must establish a relationship between the teacher and students (HP), teachers with teaching materials (HD), and students with teaching materials (ADP) so as to produce a didactic design. According to Suryadi (2011 p. 12) the three steps of teacher thinking above can be arranged in a research activity called didactial design research. Based on the statements from the three stages of didactial design research, the didactic design was designed to create a student relationship with the

material (HD) that is appropriate to the didactic situation, create a teacher-student relationship (HP) that is appropriate to the pedagogical situation, and create a teacher relationship with the material (ADP).) according to the didactical and pedagogical situation.

Didactical design is a learning design in the form of teaching materials developed based on research for identificationlearning obstacle or learning barriers in the process of learning mathematics that arise from the start. During the learning process in the classroom, didactic design teaching materials are made through a series of didactic situations along with predictions of responses and anticipations. Didactic design is designed with a function to overcome or reducelearning obstacle that appeared in the previous lesson, so that students understand the concept of mathematics as a whole. Using a didactical design it is hoped that the learning barriers experienced by students can be reduced and students do not find it difficult to understand a concept so that the goals of learning mathematics can be achieved properly.

Mathematics is one of the subjects that often occurslearning obstacle on each material taught. According to Sundayana (2013, p. 3) means that mathematics is a subject that is difficult to understand. Even though mathematics is one of the main means and certainly side by side with everyday life. The main source of reference for failure usually occurs due to the absence of support for the learning process in the classroom, namely learning media. The obstacles according to Brousseau (2002) are caused by several factors including, namelyobstacle of ontogenic origin (student learning mental readiness),obstacle of didactical origin (due to the education system), andobstacle of epistemological origin (knowledge of students who have limited application contest). Meanwhile, according to Suryadi (2016 p. 40) there are three factors that cause learning barriers (learning obstacle) among themontogeny barriers (mental readiness to learn),didactic (as a result of the teacher's teaching), andepistemology (knowledge of students who have limited application context). It can be proven that usually teachers during the learning process in class, especially mathematics lessons, are rarely seen using supporting media. Teachers only rely on makeshift facilities such as lectures, blackboards, textbooks, and directly on giving assignments or practice questions. That way will cause students to have no sense of motivation to learn mathematics because the process alone causes students to be stiff, monotonous, and also bored. Even though in the implementation of teacher learning it must be adjusted to the individual abilities of each student, considering the level of learning understanding speed varies. This is in line with Supriadi's idea (2017, p. 12) which reveals that a child's personality is unique and definitely a different individual. Therefore, problem solving in mathematics presented by the teacher should provide a variety of strategies or methods, and can also facilitate students who have high, medium, or low abilities.

Based on the results of observations and interviews conducted by researchers at SDN Karodangan while implementing PPLSP in 2022, the subject of mathematics, especially in negative integer material. There are still many students who are difficult with the material. Lots of students' answers were assessed as still not understanding the concept of the material, especially regarding the ability to understand mathematical concepts in negative integer material. Even though the ability to understand concepts in learning mathematics is very important for life. Because this ability is one of the basic abilities that continues to be even attached to everyday life. Pranata, E. (2016, p. 36) states that understanding a concept is a mastery of a number of learning materials, where students do

not just know and know, but are able to re-express the concept in a form that is easier to understand and able to apply it. Based on these symptoms, according to Zulfah (2017, p. 92) it is said that the goals of learning or the process of learning mathematics have not been achieved properly. the way that can be done is to implement improvements in the learning process. Such as learning media, strategies, models or methods that are efforts to improve the learning process are needed. In connection with the things that have been described above, the researcher chooses to package or design learning media in the form of games that may be familiar and close to children. One of the games that are familiar to these children is the snake and ladder game. According to Kartikaningtyas (2014, p. 663) Snakes and ladders are a form of traditional game that is widely known and easy to play. The game uses a board with numbered tiles, pieces and dice, and involves more than one player. The adaptation of this game to the nature of educational games is done by modifying the appearance and rules of the game.

Based on the modifications that the researcher will make, this game will connect general knowledge about one culture in the snakes and ladders game as an addition to students' insights about culture. This culture is Sundanese culture where researchers will associate the game with Sundanese culture based in it. This is of course an attraction for students so that students' curiosity about one of their cultures is high. This is in line with the statement from Arisetyawan, A. (2019, p. 1) defines that culture-based learning is a learning that has two main values in it, namelytransfer of knowladge andtransfer of value.

Furthermore, it has been explained that mathematics is one of the subjects that is always associated with everyday life. But because learning mathematics in the classroom is only a delivery of material by a teacher that makes children bored. Therefore, to improve the process of learning mathematics, researchers are trying to examine an alternative learning approach or CTL model (Contextual Teaching and Learning). This approach is a learning concept that helps teachers relate the material they teach to real situations and encourages students to make connections between the knowledge they have and its application in their daily lives as members of the family and society. This was stated by Panjaitan (Dedi J., 2016, p. , 2). This is very meaningful for students in terms of learning, because students will know the meaning of learning, the benefits of learning, and also how to achieve it. They will realize that what they learn will certainly be useful for their future life.

In connection with the above that has been described, therefore the researcher decided to use game-based learning media, namely the snake and ladder game which is designed to be used in learning mathematics about integers, especially in addition and subtraction. The making of this game not only gives the impression of the game but also contains educational elements. The researcher hopes that the existence of this learning media can increase students' interest and understanding in mathematics lessons, especially integer material. Zainal said that the child phase is a phase where children like to play so that it is possible for children to be able to learn the learning process including curiosity, discovery, and perseverance (Masrukah, 2019, p. 11). In connection with Zainal's statement that children are bored, so to invite children to learn, teachers and parents need to use props and games that can stimulate students to learn (Hamdalah, 2013). Based on the problems that have been cited above, the researcher plans to support this by using the DDR model (Didactical Design Research).

Based on this description, it is necessary to conduct a study that focuses on how to help students' obstacles/difficulties with integer material to improve mathematical concept

abilities by designing learning media as teaching materials. With that in mind, the authors raised the research title "Didactical Design of Traditional Snakes and Ladders Games Based on Sundanese Culture as a Learning Media with a ModelCTL to Improve Understanding of Mathematical Concepts in the Material of Bull Numbers in Grade VI Elementary School."

B. METHOD

This type of research uses a descriptive qualitative method with a research modelDidactical Design Research (DDR) by Suryadi (2010). This focus on DDR research refers tovalidation study nordevelopment study a didactic design that aims to reduce and overcome learning difficulties or often called learningstudent obstacles on the learning process. In Suryadi's research on researchresearch design has three main stages, namely: 1) Analysis of the didactic situation prior to learning (prospective analysis); 2) metapedidactic analysis; and 3) Retrospective analysis.

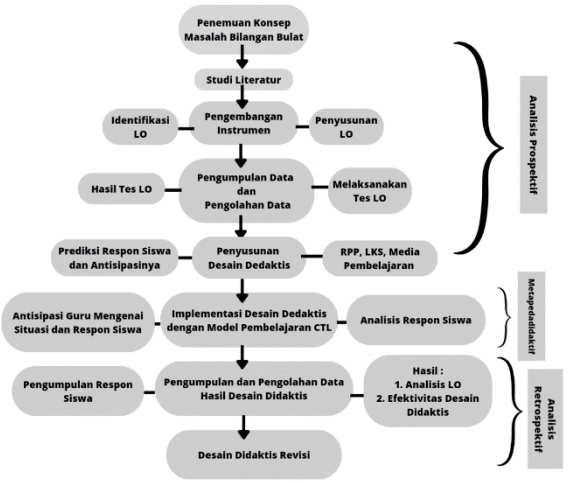


Figure 1. DDR Research Stages

The description of the stages of the research above is as follows:

1). Didactic Situation Analysis Prior to Learning/Prospective Analysis

Analysis of the didactic situation before learning takes the form of a complete didactic hypothesis design with student responses and pedagogical didactic anticipation (ADP). At this stage, there are three activities carried out by the researcher, namely repersonalization, recontextualization, and predicating student responses. a) Analysis of the didactic situation before learning takes the form of a complete didactic hypothesis design with student responses and didactic pedagogical anticipation (ADP). At this stage, there are three activities carried out by the researcher, namely repersonalization, recontextualization, and predicating student responses. b) Recontextualization activities, starting with analyzing students' conceptions of teaching materials through interviews with students, making alternative learning paths, and making predictions of responses. c) And finally, the activity of making response predictions is carried out with the aim of estimating the various answers of student participants to the problems given by the teacher so as to create new didactic situations. The predictions made by the teacher concern the student-material relationship and the teacher-student relationship both individually and in groups or classes.

To be clearer to know the stages in the Didactic Situation Analysis Before Learning / Prospective Analysis, namely: a) Examine and determine the mathematical material that will be used as research material. In this study the material that will be used as research material is integer material. b) Understanding, studying, and analyzing the selected mathematical material, namely integer material. c) Carrying out repersonalization activities, namely analyzing the mathematics textbook used during the learning process in the classroom related to the concept of integers and understanding research beforehand which examines learning difficulties that have been found. d) Compile and consult test instrumentslearning obstacle experienced by students. e) Develop a test instrument, in the form of a testlearning obstacle (LO) by compiling indicators of mathematical reasoning for each question and making questions to find outlearning obstacle (LO) that happened. f) Do the testlearning obstacle and conducting semi-structured interviews with class VII-I students to find out the obstacles or difficulties experienced by students in the whole number material. g) Analyze test resultslearning obstacle (LO) and interviews to identifylearning obstacle (LO) that occurs to students in learning. h) Develop initial didactic designs that are tailored to the needs of students to overcome learning obstacles. This DDA was compiled based on the problem of students' difficulties or obstacles found in the results of the previous initial instrument test with the aim of developing the abilities of the students who would be examined regarding integer material. i) The didactical design also contains predictions of student responses that appear in the implementation of the initial didactic design and is complemented by the teacher's anticipatory actions towards student responses that appear.

2). Metapedadidaktik

At this stage, the design metapedidactic stage that was previously made was implemented by the researcher during the learning process. This learning process must involve teachers-students-materials so that didactic situations occur. In order to be clearer to find out the stages in the analysis of active metapedagogues, namely: a) Carry out the implementation of the didactic design that has been prepared for sixth grade elementary school students. b) Analyze the situation, student responses, and anticipate student responses when the initial didactical design (DDA) has been implemented.

3). Retrospective Analysis

At this stage the researcher linked the results of the prospective/didactical situation analysis of the hypothesis in the form of the learning design that was made and the ADP with the metapedidactic analysis (implementation during the learning process). To be clearer to find out the stages in the Retrospective analysis, namely: a) Linking response predictions and anticipations that have been made previously with student responses during the implementation of the initial didactic design (DDA). b) Analyze the results of the implementation of the initial didactic design (DDA) to find out whether obstacles or difficulties still exist or do not exist. c) Analyze the effectiveness of the didactic design. d) Make a revision of the didactic design (RDD) if there are still obstacles or difficulties at the implementation stage. e) Prepare a research report. From the three stages above, empirical didactic design teaching materials will be obtained which does not rule out the possibility of continuing to be refined through the three didactic design stages.

C. RESULTS AND DISCUSSION

Research Findings

The researcher presents an explanation of the results and discussion of the research related to the didactic design regarding the understanding abilities that will be examined, namely the ability to understand mathematical concepts through culture-based learning media with modelscontextual teaching and learning (CTL) to overcome obstacles or difficulties (learning obstacle) students on the subject of integers class VI Elementary School. The research findings consist of three stages, namely as follows:

1. Learning Obstacle (LO)

In the first step of this research, the researcher identified the LO that occurred in positive and negative integer problems. The LO test was carried out at one of the schools, namely SMPN 1 Pasirjambu which was carried out in class VII-I with a total of twenty students. The purpose of distributing this LO test is to find obstacles and difficulties that students have. The LO test will be held on December 12, 2022. This LO test also has five questions. The questions are made according to indicators on the ability to understand mathematical concepts. Researchers took five indicators for the preparation of the LO test. In the following, the researcher will display the results of the responses to the LO test that was carried out on integer material questions, namely as follows:

Table 1. Student Response Results Based on the LO Test on Integer Problems

Indicator of Ability to Understand Mathematical Concepts	The number of students	Question Number		As Predicted	Part As Predicted	Not According to Predictions
Ability to restate concepts learned by students	20	1	a	18	-	2
			b	18	-	2
Presenting concepts in various forms of mathematical representation	20	2		6	11	3
Develop necessary/sufficient requirements of a concept	20	3	a	5	-	15
			b	6	-	14
			c	3	-	18
Using and utilizing and selecting certain procedures or operations	20	4	a	4	11	5
			b	4	6	10
Classify concepts into problem solving	20	5		4	15	1

Based on the results of the LO test, the researcher found several obstacles and difficulties for students regarding the material under study and obtained LO results related to the 5 indicators of understanding mathematical concepts which were grouped into 3 types, namely:

Type 1 :Learning obstacle related to writing positive and negative signs in solving problems.

Type 2 :Learning obstacle related to interpreting word problems in the form of arithmetic operations.

Type 3 :Learning obstacle related to the use of the properties of integer arithmetic operations.

The results of the interviews with the researchers proved that the students had indeed studied integer material. However, students still say that integer material is difficult. Even though the material being tested was material that had been delivered when he was still in school at the elementary level and certainly not far from their daily lives. From the results of these data, more students do not understand formulas or properties of integers. A strong enough reason why students experience difficulties is because they forget the material and formulas contained in the material. If they forget, they will automatically not be able to understand some of the questions being tested which are related to the ability to understand the mathematical concept of integer matter. And also the relationship between the teacher and students regarding the delivery of material is lacking and that is one of the reasons students do not understand the material because the teacher only relies on media from textbooks. Therefore, when students are given the LO test, most students answer as it is without any mathematical concepts, meaning that students have difficulty understanding the questions and working on them. Below will be explained in more detail about the resultslearning obstacle students in the material for positive and negative numbers based on the three types found, which are as follows:

Learning obstacle type 1 that occurs in students is related to the material for integer arithmetic operations, namely in writing positive and negative signs in solving problems. Students still experience difficulties regarding the understanding of a placement of mathematical symbols that are used to express positive and negative ideas in the given integer problems. The following are student responses to question number 1 which becamelearning obstacle type 1 in parts a and b, namely, as follows:

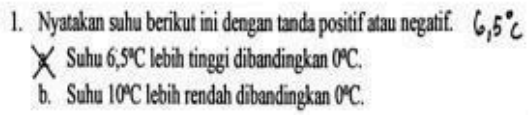

1. Nyatakan suhu berikut ini dengan tanda positif atau negatif. 6,5°C
   a. Suhu 6,5°C lebih tinggi dibandingkan 0°C.
   b. Suhu 10°C lebih rendah dibandingkan 0°C.

Figure 2. Answers of Type 1 LO Students

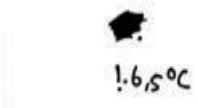
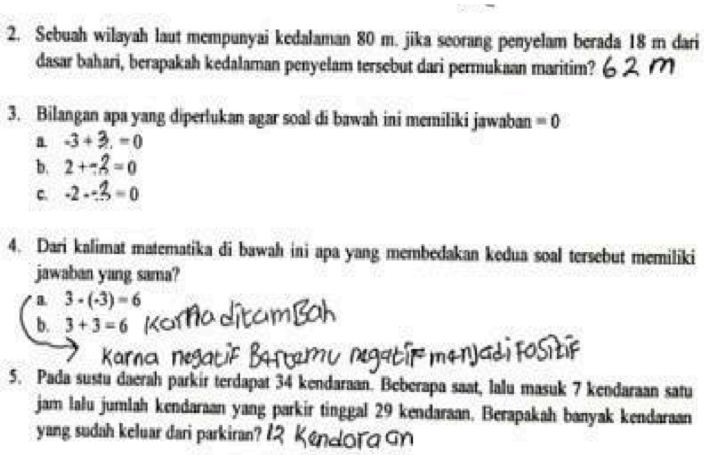


Figure 3. Answers of Type 1 LO Students

The response to the answers given in the two pictures above is clear that the two students are indeed experiencing difficulties and it can be seen that the answers of both are not in accordance with the predictions, picture 2 students do not answer the questions given. In part a the students just rewrote the questions given without any positive or negative symbols according to the question instructions. And for part b, students don't even give an answer at all. And picture 3 part a, the student does not give positive or negative symbols. While part b is not given an answer at all.

Learning obstacle type 2 that occurs to students is related to the material for integer arithmetic operations, namely interpreting word problems into the form of arithmetic operations. In type 2 problems where students do not understand the integer questions in

the form of stories that must be answered with mathematical concepts to facilitate the process. The following are student responses to questions number 2 and 5 which becamelearning obstacle type 2, as follows:

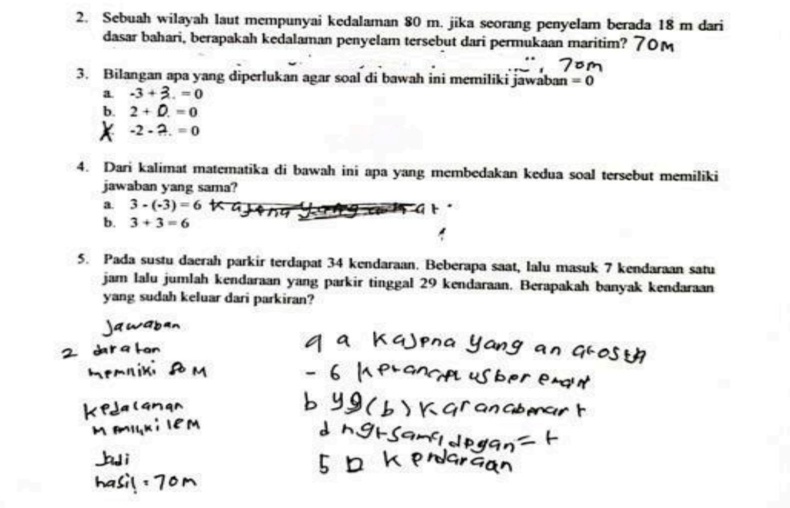

2. Sebuah wilayah laut mempunyai kedalaman 80 m. jika seorang penyelam berada 18 m dari dasar bahari, berapakah kedalaman penyelam tersebut dari permukaan maritim? 62 m

3. Bilangan apa yang diperlukan agar soal di bawah ini memiliki jawaban = 0
a. -3 + 3 = 0
b. 2 + -2 = 0
c. -2 - -3 = 0

4. Dari kalimat matematika di bawah ini apa yang membedakan kedua soal tersebut memiliki jawaban yang sama?
a. 3 - (-3) = 6
b. 3 + 3 = 6 karna ditambah
karna negatif bertemu negatif menjadi positif

5. Pada susu daerah parkir terdapat 34 kendaraan. Beberapa saat, lalu masuk 7 kendaraan satu jam lalu jumlah kendaraan yang parkir tinggal 29 kendaraan. Berapakah banyak kendaraan yang sudah keluar dari parkiran? 12 kendaraan

Figure 4. Answers of Type 2 LO Students


2. Sebuah wilayah laut mempunyai kedalaman 80 m. jika seorang penyelam berada 18 m dari dasar bahari, berapakah kedalaman penyelam tersebut dari permukaan maritim? 70m

3. Bilangan apa yang diperlukan agar soal di bawah ini memiliki jawaban = 0
a. -3 + 3 = 0
b. 2 + 0 = 0
c. -2 - 2 = 0

4. Dari kalimat matematika di bawah ini apa yang membedakan kedua soal tersebut memiliki jawaban yang sama?
a. 3 - (-3) = 6
b. 3 + 3 = 6

5. Pada susu daerah parkir terdapat 34 kendaraan. Beberapa saat, lalu masuk 7 kendaraan satu jam lalu jumlah kendaraan yang parkir tinggal 29 kendaraan. Berapakah banyak kendaraan yang sudah keluar dari parkiran?

Figure 5. Answers of Type 2 LO Students

The response to the answers given in the two pictures above is clear that the two students are still experiencing obstacles or difficulties, it can be seen that in Figure 4 the students gave answers according to the predictions the students only gave their answers without any way to solve them, even though the way to solve the story questions would be easier for students to answer. And for the responses the answers given by students in Figure 5 are not in accordance with the predictions where students do not answer using the completion method and that makes students wrong in answering.

Learning obstacle type 3 that occurs in students is related to the material for integer arithmetic operations, namely the use of the properties of integer arithmetic operations. In type 3 problems where students do not understand the use of properties or formulas found in integer material. The following are student responses to questions number 3 and 4 which becamelearning obstacle type 3, as follows:

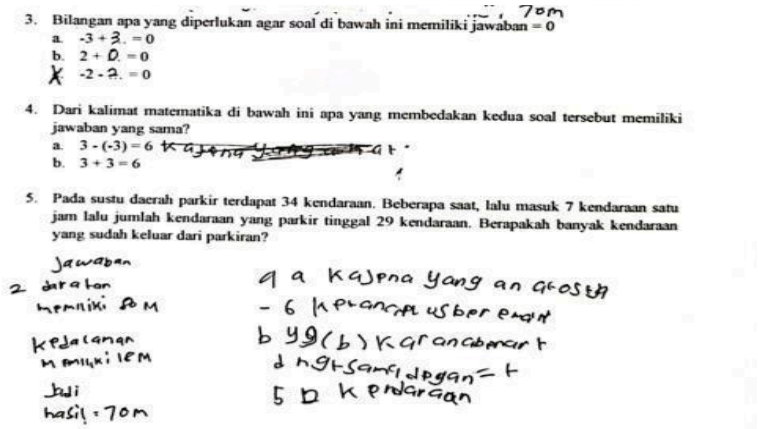


Figure 6. Answers of Type 3 LO Students

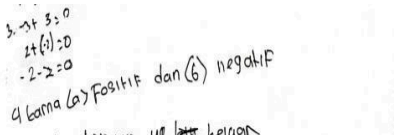


Figure 7. Answers of Type 3 LO Students

The response to the answers given in the two pictures above is clear that the answers to the two are still experiencing difficulties or obstacles. In Figure 6 the response given is still not according to predictions where students still look random in answering questions about the properties of integer arithmetic operations. In the answers to figure 7, the responses given by students to question number 3 are correct and appropriate, but one of the student's answers has a problem, namely a misconception where if -2 - 2 does not produce 0 but increases the number of negatives. And for response number 4 there is still a prediction discrepancy.

Thus, based on the typesLearning obstacle explained above that junior high school students still experience obstacles or difficulties in the positive and negative integer material.

2. Initial Didactic Design (DDA)

After analyzing the test testlearning obstacle on integer material, the next stage that will be carried out in this research is to compile an initial didactic design (DDA) on integer material, this aims to reduce or minimize and overcome obstacles or difficultieslearning obstacle what happened to students. This Didactic Design will be prepared using additional culture-based learning media modified with modelscontextual teaching learning. After the DDA is compiled, the researcher will implement this DDA in class VI students at SDN Sayabulu on February 16 2023. The number of students in implementing the DDA is 20 students. The researcher designed the DDA into 1 LKS which included all indicators on understanding mathematical concepts and covered the three types of problems in the previous LO questions. In this study, researchers used a traditional game of snakes and ladders which will be modified. The rules and tools used in this game are the same, it's just that the appearance of the game will be changed according to the needs of researchers

according to the material used. This game will be a medium in the learning process in class to explain integer material.

Figure 8. Nyunda Snake Ladder Game (Modification)

In the following, the researcher will display the results of student responses to the DDA LKS that has been implemented in integer questions, as follows:

Table 2. Results of Student Responses to LKS DDA

Indicator of Ability to Understand Mathematical Concepts	The number of students	Question Number	As Predicted	Part As Predicted	Not According to Predictions
Ability to restate concepts learned by students	20	1	20	-	-
		2	20	-	-
		3	16	-	4
Presenting concepts in various forms of mathematical representation	20	4	11	3	6
Develop necessary/sufficient requirements of a concept	20	5	5	5	10
Using and utilizing and selecting certain procedures or operations	20	6	17	-	3
Classify concepts into problem solving	20	7	8	10	2

Based on the results of the table above, almost all students experience obstacles in the integer material. In number one, all students can be said to understand the meaning of integers, all of them answer according to predictions and no part or not according to predictions. Question number two can be said to have no obstacles because all students can answer according to predictions, in this question they can mention the symbol in the problem given. However, in question number three, the similarity of the questions is the same as the previous number. Here there are some students who are still experiencing obstacles where the answers are not as predicted. In question number four, almost all of the

twenty students had the same problem. Three people answered according to predictions and six people did not according to predictions. Here it can be seen that problem number four must be developed so that students can understand more. In number five, you can see the results of the evenly distributed answers from twenty students who answered according to predictions, only five students, some according to predictions, only five students, and the remaining ten people did not match predictions. Here the problem is that students still do not understand the conditions that apply to integer arithmetic operations. For number six, the question is similar to number five, namely regarding the conditions that apply, but here the student response can be said to be almost optimal because out of twenty students, only three people have learning difficulties and the rest are according to predictions. And for the last question, namely number seven out of twenty students, only eight students answered according to predictions, the rest were partly appropriate and not according to predictions.

So from the results that have been described above, a revision of the questions is needed for the next step to minimize student responses which are still partly as predicted and not as predicted.

3. Didactical Design Revision (RDD)

Didactic Design Revision is the next process after the implementation of the Initial Didactic Design (DDA). Based on the previously implemented DDA, the results of student responses (didactic situations) with the researchers' predictions. RDD is also designed based on the LO that appears during DDA. The design revisions made were changes to the questions but with the same editor. This RDD still uses learning based on Sundanese cultural gamesmodel contextual teaching ang learnig. The researcher implemented RDD on students from different schools from implementing DDA, namely at SDN Perigi Baru with the same class, namely class VI on February 23, 2013. Below is a more detailed explanation of the implementation of RDD on integer material, namely:

Table 3. Results of Student Responses to LKS RDD

Indicator of Ability to Understand Mathematical Concepts	The number of students	Question Number	As Predicted	Part As Predicted	Not According to Predictions
Ability to restate concepts learned by students	20	1	20	-	-
		2	20	-	-
		3	20	-	-
Presenting concepts in various forms of mathematical representation	20	4	20	-	-
Develop necessary/sufficient requirements of a concept	20	5	20	-	-
		6	20	-	-
Using and utilizing and selecting certain procedures or operations	20	7	20	-	-
Classify concepts into problem solving	20	8	20	-	-

Based on the table above, the results of implementing the LKS RDD questions can be said to be optimal. Because almost all students in the questions given responded according to the teacher's prediction. On the difficulty of type one regarding giving a negative or positive symbol to questions number one, two, and three. It can be seen that twenty students were able to answer correctly. When working on these questions the teacher observed that students were able to understand the problems in the questions, students were able to illustrate questions in everyday life. Then, on the difficulty type two on questions number four and eight twenty students were able to solve word problems where students were able to make mathematical sentences according to mathematical concepts. And the difficulties of students in the third type in questions number five, six, and seven, twenty students have been able to understand the characteristics or conditions that apply to integer arithmetic operations, especially in the arithmetic operations of addition and subtraction on negative positive integers. When the teacher makes predictions and implements these questions, the teacher does not forget to provide anticipation. The anticipation given to the difficulties experienced by the teacher's students only provides an input to introduce a number line again that is adapted to the game being played. Students can answer with a number line to make it easier to understand the context of the question.

A teacher should have the ability to establish relationships between teachers and students (HP), teachers with teaching materials (HD), and students with teaching materials (ADP). This model was introduced by Suryadi (2010) which is called the metapedidactic theory, namely the teacher's ability to analyze the didactical triangle. According to Suryadi (2011 p. 12) the three steps of teacher thinking above can be arranged in a research activity called didactial design research. Didactical design is a learning design in the form of teaching materials developed based on research for identificationlearning obstacle or learning barriers in the process of learning mathematics that arise from the start. Didactic design is designed with a function to overcome or reducelearning obstacle that appeared in the previous lesson, so that students understand the concept of mathematics as a whole. Using a didactical design it is hoped that the learning barriers experienced by students can be reduced and students do not find it difficult to understand a concept so that the goals of learning mathematics can be achieved properly. With this statement, learning that contains a didactical triangle (Suryadi, 2010) is supported by educational media and learning models.contextual teaching and learning which has been implemented can create a learning process and produce optimal learning outcomes which can be seen in the responses of students' answers that have not experienced learning obstacles or learning barriers or which are in accordance with the predictions of researchers.

D. CONCLUSION

The results of the LO test conducted in class VII-I of SMPN 1 Pasirjambu indicated that there were student learning barriers (learning obstacle) which can be classified into three types namely: typeLearning obstacle related to writing positive and negative signs in solving problems, typeLearning obstacle related to interpreting word problems into the form of arithmetic operations, and typesLearning obstacle associated with the use of properties integer arithmetic operations.

The results of the DDA implementation carried out in class VI SDN Sayabulu on the ability to understand mathematical concepts by associating learning media with modelsCTL in positive and negative integer material, it has a response that students are

still experiencing difficulties or learning barriers. It can be asked that the results are not optimal and require revision in the next step.

Result of RDD implementationwhich was carried out in class VI at SDN Perigi Baru on the ability to understand mathematical concepts by associating learning media with modelsCTL on the material positive negative integers have a response that studentsit can be said to be optimal because it is proven that from a didactic design activity that has been implemented to students there is no longer a response from students who answer not in accordance with the researchers' predictions. Therefore, the learning process with a learning media is in the form of culture-based educational games with modelscontextual teaching learning students on integer material in grade VI elementary school can be said to be optimal and can overcome or minimize obstacles or difficulties (learning obstacle) experienced by students that still occur during the implementation of DDA.

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