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MATHEMATICAL PROBLEM-SOLVING SKILLS USING THE SCAMPER TECHNIQUE WITH RESOURCE-BASED LEARNING MODEL

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ABSTRAK

Tujuan penelitian ini adalah untuk mengetahui kemampuan pemecahan masalah siswa yang menggunakan teknik SCAMPER dengan Model Resource Based Learning dan kemampuan pemecahan masalah siswa pada pembelajaran konvensional, serta ada tidaknya perbedaan kemampuan pemecahan masalah. siswa pada pembelajaran teknik SCAMPER dengan Model Resource Based Learning dengan Model Pembelajaran Konvensional. Penelitian ini merupakan penelitian lapangan yang terjun ke lapangan untuk menggali dan mengumpulkan sejumlah data yang diperlukan mengenai teknik SCAMPER dengan Model Resource Based Learning dalam kemampuan pemecahan masalah siswa pada materi aritmatika sosial. Pendekatan yang digunakan adalah pendekatan kuantitatif, yaitu berupa data numerik dan dianalisis secara statistik. Metode yang digunakan dalam penelitian ini adalah metode eksperimen. Desain penelitian dalam penelitian ini adalah Non-Equivalent Control Group Design, desain subjek penelitian ini tidak dipilih secara acak tetapi dipilih berdasarkan kemampuan awal yang sama antar subjek penelitian. Pengumpulan data dalam penelitian ini dilakukan dengan cara observasi, wawancara, dokumentasi, dan metode tes. Setelah data terkumpul, selanjutnya diolah dan dianalisis secara kuantitatif. Hasil penelitian menunjukkan bahwa kemampuan pemecahan masalah dengan teknik SCAMPER dengan Model Resource Based Learning termasuk dalam kategori sangat baik dan kemampuan pemecahan masalah siswa pada pembelajaran konvensional termasuk dalam kategori baik. Terdapat perbedaan yang signifikan antara kemampuan pemecahan masalah siswa pada pembelajaran dengan teknik SCAMPER dan Model Resource Based Learning dengan pembelajaran konvensional.
Kata kunci: kemampuan pemecahan masalah, teknik SCAMPER, Resource Based Learning

ABSTRACT

The purpose of this study was to determine the problem-solving ability of students using the SCAMPER technique with the Resource Based Learning Model and the problem-solving abilities of students in conventional learning, as well as whether there are differences in the problem-solving abilities of students in SCAMPER technique learning with Resource Based Learning Model with Conventional Learning Model. This research is field research that goes into the field to explore and collect a number of necessary data regarding the SCAMPER technique with the Resource Based Learning Model in students' problem-solving abilities on social arithmetic material. The approach used is a quantitative approach, which is in the form of numerical data and analyzed statistically. The method used in this research is the experimental method. The research design in this study is Non-Equivalent Control Group Design, this design research subjects were not chosen randomly but were selected based on the same initial ability between research subjects. Data collection in this study was taken by means of observation, interviews, documentation, and test methods. After the data is collected, it is then processed and analyzed quantitatively. The results showed that the problem-solving ability using the SCAMPER technique with the Resource Based Learning Model was included in the very good category and the problem-solving abilities of students in conventional learning were included in the good category. There is a significant difference

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between students' problem-solving abilities in learning with the SCAMPER technique and the Resource Based Learning Model with conventional learning.
***Keyword**: problem solving abilities, SCAMPER technique, Resource Based Learning*

PENDAHULUAN

Problem solving has an important role in Mathematics and thus it becomes the main objective within the mathematics learning [1] Therefore, it does make sense when problem solving become one of the important skills within the learning objectives of Mathematics in schools. For example, in junior high school degree, the learning objectives of Mathematics have always been based on the problem solving. Not to mention, problem solving is so important that it becomes one of the five standard competencies in Mathematics [2] Recalling the importance of problem solving, the teachers of Mathematics are expected to habituate themselves to present the problem-solving type-mathematical test items.

With regards to the previous explanation, one of the active and creative ways that the teachers of Mathematics can develop in order to deliver the freedom for the students in solving their problems is implementing the SCAMPER Technique with the assistance of Resource-Based Learning (RBL) Model [3][7]. SCAMPER Technique refers to the technique that displays questions in order to generate new and different ideas through the existing objects. The term SCAMPER itself is an acronym of Substitute, Combine, Adapt, Modify, Put to Other Uses, Eliminate, and Rearrange [4][7][8]

Solving problems in the materials of Social Arithmetic on the discussion over Profit and Loss through the use of SCAMPER Technique is expected to assist the students in understanding the given learning materials under the active and creative learning process. Being active and creative in learning Social Arithmetic under the framework of problem-solving using the SCAMPER Technique can create more interesting learning atmosphere in the school and, at the same time, put emphasis on the optimum involvement among the students through the selection of numerous learning resources in accordance with the talent and the capacity of the students. On the contrary, Resource-Based Learning Model refers to the learning model in which the students are able to tone down their anxiety and to improve their learning activeness. Through such learning model, the students will not only master the same learning materials but also attach the importance of studying and developing interests, concepts, and skills to themselves [5]

Then, the SCAMPER Technique and the Resource-Based Learning Model can be considered as the technique and the model that assist the students in solving the social arithmetical problems over the discussions of profit and loss. Then, with regards to the statement, the discussions within the study are dominated more by the narrative test items since the narrative test items have caused a lot of difficulties among the students [6] Specifically, through the study the researchers would like to: (1) identify the problem-solving skills of the students through the use of SCAMPER Technique and the Resource-Based Learning Model on the materials of Social Arithmetic among the Grade VII students of State Madrasah Tsanawiyah 3 the City of Banjarmasin; (2) identify the problem-solving skills among the students who implement the Conventional Learning Model over the materials of Social Arithmetic in the Grade VII of Madrasah Tsanawiyah 3 the City of Banjarmasin; and (3) identify the differences on the problem-solving skills between the students who implement the SCAMPER Technique and the Resource-Based Learning Model and the students who implement the Conventional Learning Model over the materials of Social Arithmetic in Grade VII of State Madrasah Tsanawiyah 3 the City of Banjarmasin.

METODE

In conducting the study, the researchers had adopted the quantitative approach. Specifically, the researchers associated the quantitative approach to the positivism epistemology and the association was usually seen as mere data gathering and data analyzing activities in the form of

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numbers [9]. Then, the method that had been adopted in the study was the experiment. Thus, the researchers had assigned two groups, namely an experimental group and a control group, within the study. The experimental group referred to the group that had been provided with the SCAMPER Technique and the Resource-Based Learning Model, while the control group referred to the group that had been provided with the Conventional Learning Technique. In adopting this method, the researchers implemented the Non-Equivalent Control Group Design. Based on the design, the subjects were not randomly selected; instead, the subjects were selected based on the same-level preliminary skills from one to another. In order to determine the same-level preliminary skills among the students were defined, the researchers took the results of the daily examination on the previous learning material. As a result, the researchers were able to assign the students into the experimental group and the control group.

Then, the population within the study were all Grade VII students from the Madrasah Tsanawiyah 3 the City of Banjarmasin in the Even Semester of 2021/2022 Academic Year. The overall population of the Grade VII Students in the Madrasah Tsanawiyah 3 the City of Banjarmasin was provided in Table 1 below.

Table 1. The Population of Grade VII Students in the Madrasah Tsanawiyah 3 the City of Banjarmasin

Grade	Number of Students
A	32
B	32
C	33
D	35
E	31
F	35
G	34
H	35
Total	267

Based on the total population in Table 1 above, the researchers would define the members of both the experimental group and the control group by picking the samples either randomly or non-randomly.

The samples that had been selected for the study were the students from Grade VII E and Grade VII G. The Grade VII G students served as the experimental group (the group that would be provided with the SCAMPER Technique and the Resource-Based Learning Model) while the Grade VII E students served as the control group (the group that would be provided with the Conventional Learning Model). The selection on the students from both grades were based on the following consideration:

1. The same skills among the research subjects
2. The skills that had been observed from the results of the previous daily examination
3. The previous study which had involved the students from both Grade VII E and Grade VII G

The data in the study were gathered through several stages and these stages were elaborated as follows:

1. Test
   The test that had been administered in the study was the final test, namely the test that had been administered in order to measure the achievement of the students who had been learning the Social Arithmetic by using the SCAMPER Technique with the Resource-Based Learning Model. The test itself was conducted at the end of the discussion over the materials of Profit and Loss. The type of the test itself was the write test in the form of narrative test items.
2. Observation
   The observation was conducted by directly visiting the research site in order to gather the supporting data that consisted of teaching-learning process in Grade VII during the Covid-19 Pandemic, the conditions of the facilities under possession, the conditions of the teachers and the employees, and the conditions of the students in the State

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Madrasah Tsanawiyah 3 the City of Banjarmasin.

3. Documentation
   The documentation aimed at attaining the data in the mathematical learning process implementation through the use of SCAMPER Technique and Resource-Based Learning Model on the materials of Social Arithmetic in Grade VII of State Madrasah Tsanawiyah 3 thhe City of Banjarmasin on the 2021/2022 Academic Year. At the same time, the documentation also aimed at attaining the supporting data in the form of necessary school archives and activities.
4. Interview
   Interview could be defined as a process of attaining information through question-and-answer session toward an interviewee with or without interview guidelines [10] The interview was conducted in order to strengthen the data that the researcher had attained through observation and documentation.

As one of the requirements for conducting the study, an instrument should be devised in accordance with the objective of the study. Thus, the test instrument was designed through the following stages:

1. Research Instrument
   The instrument that had been implemented in order to gather the data in the study was the test. Specifically, the test consisted of 6 narrative test items and each narrative test item was adjusted to the given indicator in order to measure the problem-solving skills of the students over the materials of Social Arithmetic, which included the topic of Profit and Loss, with reference to the 2013 Curriculum.
2. Instrument Design
   The instrument was devised by paying attention to the following aspects:
   a. Relevance with the research objective
   b. Reference to the learning materials in State Madrasah Tsanawiyah 3 the City of Banjarmasin
   c. Administration of essay or narrative-type test items
3. Instrument Testing
   Based on the objective of the study, the researchers administered the final test instrument. Prior to the administration of the final test instrument, the researchers should conduct the validity test and the reliability test. The instrument testing was conducted toward 33 students of Grade VII F in the State Madrasah Tsanawiyah 3 the City of Banjarmasin. The reason was that the 33 students from Grade VII F had completed the learning process of Social Arithmetic over the discussions of Profit and Loss. Then, the procedures of both the validity test and the reliability test.

Then, an instrument might gain high level of reliability if the measurement results were relatively similar in several measurements for the same group. In relation to the statement, if the Cronbach's Alpha score was higher than the minimum requirement, namely 0.60, then it could be concluded that the instrument had been reliable. On the contrary, if the Cronbach's Alpha score was lower than the minimum requirement then it could be concluded that the instrument had not been reliable.

There were two compositions on the test item indicators for the test in the materials of Social Arithmetic namely Profit and Loss. These compositions were specifically explained in Table 3 below.

Table 3. Test Item Composition for the Instrument Testing

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The test instrument, which consisted of 6 test items, had been valid and had been taken from the test items of Instrument Number 1 and Instrument Number 2 that had been combined into a single instrument with the same indicators. Then, the instrument was put into experiment with the same school but different grade, namely Grade VII E with total 27 students and Grade VII G with total 32 students. The test instrument was administed in order to measure the problem-solving skills of the students in dealing with the Social Arithmetic test items.

The scoring guidelines for the problem-solving skills of the students were provided in Table 4 below.

Table 4. The Scoring Guideline for the Problem-Solving Skills of the Students

No	Aspect under Measurement	Score	Indicator
1	Problem identification and understanding skills	3	Students compose what they have understood from and what has been asked by the test item completely and appropriately.
		2	Students compose what they have understood from and what has been asked by the test item appropriately but the information that they have composed is incomplete.
		1	Students compose what they have understood from and what has been asked by the test item but the information that they have composed is incorrect.
		0	Students do not compose what they have understood from and what has been asked by the test item.
2	Problem solution planning skills	2	Students use appropriate sequence or formula.
		1	Students use

No	Aspect	Test Item Indicator	Number of Test Item	Problem-Solving Indicators
1.	Profit	Students are able to solve contextual problems with regards to Social Arithmetic on the topic of Profit	3	a. Problem Identification Skills b. Solution Planning Skills c. Problem-Solving Skills d. Re-Checking Skills
2.	Loss	Students are able to solve contextual problems with regards to Social Arithmetic on the topic of Loss	2	

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No	Aspect under Measurement	Score	Indicator
			inappropriate sequence or formula.
		0	Students do not use any sequence or formula.
		3	Students solve the problem appropriately through the complete sequence.
3	Problem-solving skills in accordance with the plan	2	Students solve the problem appropriately through the incomplete sequence.
		1	Students solve the problem but the solution is incorrect.
		0	Students do not solve the problems.
		2	Students conclude the problem solution appropriately.
4	Solution interpretation skills	1	Students conclude the problem solution inappropriately.
		0	Students do not conclude the problem solution.

Then, the technique that had been implemented in order to measure the problem-solving skills was the percentage calculation technique with the following formula:

$$P_x = \frac{\sum X_0}{\sum m} x100\%$$

Note:

P_x : the percentage of variable x

$\sum X_0$: the number of X score that had been attained

$\sum X_m$: the number of maximum scores

Table 5. Interpretation of Problem-Solving Skills

No	Score	Category
1	80.0 – 100	Very Good
2	65 – 79.9	Good
3	55 – 64.9	Moderate
4	40 – 54.9	Poor
5	0 – 39.9	Very Poor

Subsequently, the score that had been attained would be process through statistical test in order to identify the presence or the absence of the significant difference between the problem-solving using SCAMPER Technique with Resource-Based Learning Model and the problem-solving using the Conventional Learning Technique. After the data had been gathered, the researchers analyzed the data so that the data would be more systematically arranged and, thus, would be easier to interpret. The data that had been attained were the data from the test results of problem-solving skills among the students or the data from the final test. The analysis on the problem-solving skills were based on the differences between the proportion of the students' learning mastery before the learning process and the proportion of the students' learning mastery after the learning process.

The data on the learning results of Mathematics were presented in the form of final test. The final test results were analyzed by using the descriptive statistics and the analytical statistics. The analytical statistics that had been implemented were the differential test namely the T-test or the Mann-Whitney Test. Prior to the administration of the differential test, the researchers first calculated the statistics that included the mean score and the deviation standards. The T-test was administered if the data were homogenous and normally distributed, while Mann-Whitney Test (U-

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Test) was administered if the data were not normally distributed.

Furthermore, in order to make decisions with the significance rate $\alpha = 5\%$ with $dk = n_1 + n - 2$, if $-t_{table} \leq t_{count} \leq t_{table}$, then H_o would be accepted and H_a would be denied. On the contrary, the researchers conducted the independent sample t-test with the assistance from SPSS 16. The aim of conducting the test was to identify whether there were differences between the experimental group and the control group or not within the test.

HASIL

Results

Description on the Learning Activities within the Experimental Group

In general, the learning activities in the experimental group that make use of the SCAMPER Technique with the Resource-Based Learning Model are conducted in the second meeting. The learning materials in the second meeting is Social Arithmetic with the discussions over the topic of Profit and Loss. The learning activities in the experimental group, which make use of the SCAMPER Technique with the Resource-Based Learning Model, can be described as follows:

1. Preliminary Activities

In the preliminary activities, the teacher opens the classroom by greeting the students and inviting them to pray first. Then, the teacher gives the opportunity for the students to complete the attendance list through the WhatsApp Group Chat. During the completion of the attendance list, the students do not want to take turn. Consequently, the teacher should remind them to take turn in completing the attendance list. Afterward, the teacher explains the learning materials of the Social Arithmetic to the students by using the SCAMPER Technique with the Resource-Based Learning Model.

Figure 1. The Attendance List of the Students

2. Core Activities
   a. Material Presentation

   The teacher delivers the information about Social Arithmetic on the topic of Profit and Loss by using learning video-based PowerPoint Presentation. In this occasion, the teacher delivers the materials in detail based on the sequence from the SCAMPER Technique. The learning process itself refers to lesson plan that has been prepared complete with the relevant formulas, test item examples, and problem solutions. At the beginning, the teacher explains the learning materials and then proceeds to the question-and-answer session with the students. If the students have questions, they can raise them through the chat column of their WhatsApp Group or through the personal chat with the teacher. Afterward, the teacher

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distributes the student worksheet to the students individually.

Figure 2. Material Presentation by the Teacher

b. Individual Activities

In the individual activities, the students are asked to pay attention to the video that the teachers have prepared. Departing from the video, the teacher explains how to solve the narrative test items by using the SCAMPER Technique as follows:

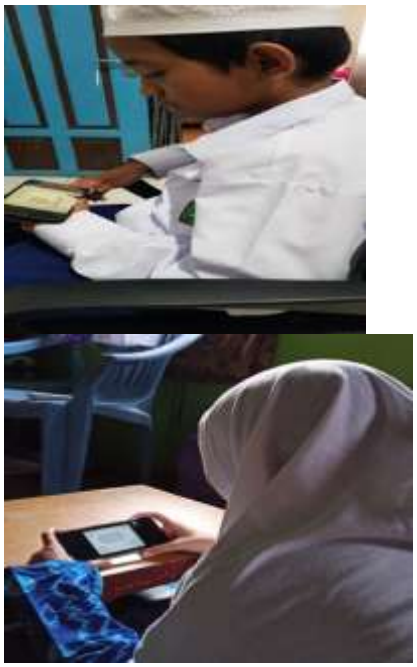

Figure 3. Individual Activities of the Students

1. Substitute

   The "Substitute" activities can be conducted by directing the students to substitute the shape, the process, or the component of an object. In the learning video, the teacher directs the students to substitute the sale price, the purchase price, the profit, and the loss with the variable SP, PP, P, and L, which concept has been explained by the teacher in the video.

Figure 4. Teacher Presentation on "Substitute" Technique

2. Combine

   The students are directed to combine two objects or more into the problem solution. Within the learning video, the teacher directs the students to combine the sale price and the purchase price with the mathematical operation of summation and subtraction so that the students will earn the profit and the loss.

3. Adapt

   The students should be able to match or adapt one object to another. Within the learning video, the teacher directs the students to adapt the capital, the purchase price, and the sale price so that they know what they have to work on.

4. Modify

   The students are directed to modify the object by decreasing or increasing the size, the quality, or the speed. Within the learning video, the teacher directs the students to find their answer by paying attention to any information that they have attained from the narrative test item.

5. Put to Other Uses

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In this sequence, the students are directed to use an idea into another function in another context. Within the learning video, the teacher directs the students to define the percentage of higher profit or loss by using the arithmetical concept that they have mastered.

6. Eliminate
   The students are asked to eliminate a component from the idea or the object in order to create a new idea. Within the learning video, the teacher asks the students to eliminate the profit and the loss. Then, they are directed to answer the profit and the loss by using the concept of profit and loss percentage that they have mastered.
7. Rearrange
   The students are asked to rearrange new objects based on the objects that the teacher has provided. Within the learning video, the teacher directs the students to make conclusions at the end of each answer.

Figure 5. Teacher Presentation on the "Rearrange" Sequence

3. Final Activities

Subsequently, the teacher asks the students to work on the exercise items in the Student Worksheet and submit their work under the designated deadline. Afterward, within the learning video the teacher concludes the learning process by saying *hamdalah* and greetings. Then, the teacher explains that there will be final assessment next week. The final assessment is conducted in order to measure the level of material mastery in relation to the materials that have been taught namely Social Arithmetic on Profit and Loss.

1. Test Results of the Mathematical Problem-Solving Skills for the Students in the Experimental Group

The description on the mathematical problem-solving skills for the learning materials of Social Arithmetic in the experimental group is based on the indicators of the problem-solving skills namely problem identification, problem solution planning, problem-solving skills in accordance with the plan, and solution interpretation skills. The description thus will be elaborated as follows.

a. The Problem Identification Skills of the Students in the Experimental Group

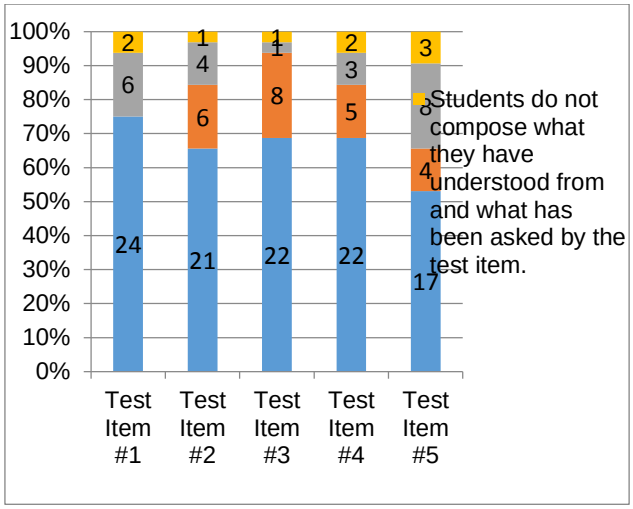

Figure 6. Description on the Problem Identification Skills of the Students in the Experimental Group

From the description in Figure 6, it can be concluded that in overall the students in the experimental group can identify the given problems. Specifically, with regards to the first indicator in problem identification and understanding skills, 24 students (75.00%) are able to compose what they have understood from and what has been asked by the test item completely and appropriately for Test Item#1. Then, 21 students (65.52%) are able to compose what they have understood from and what has been asked by the test item completely and

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appropriately for Test Item #2. Next, 22 students (68.75%) are able to compose what they have understood from and what has been asked by the test item completely and appropriately for Test Item #3 and Test Item #4 respectively. Furthermore, 17 students (53.12%) are able to compose what they have understood from and what has been asked by the test item completely and appropriately for Test Item #5.

On the contrary, with regards to the second indicator in the problem identification and understanding skills, the researchers also gather some interesting finding. First, 6 students (18.75%) are able to compose what they have understood from and what has been asked by the test item appropriately but the information that they have composed is incomplete for Test Item #2. Second, 8 students (25.00%) are able to compose what they have understood from and what has been asked by the test item appropriately but the information that they have composed is incomplete for Test Item #3. Third, 5 students (15.62%) are able to compose what they have understood from and what has been asked by the test item appropriately but the information that they have composed is incomplete for Test Item #4. Fourth, 4 students (12.50%) are able to compose what they have understood from and what has been asked by the test item appropriately but the information that they have composed is incomplete for Test Item #5,

Furthermore, there are interesting findings with regards to the third indicator in the problem identification and understanding skills. For example, 6 students (18.75%) are able to compose what they have understood from and what has been asked by the test item but the information that they have composed is incorrect for Test Item #1. Then, 4 students (12.50%) are able to compose what they have understood from and what has been asked by the test item but the information that they have composed is incorrect for Test Item #2. Next, 1 student (3.12%) is able to compose what he has understood from and what has been asked by the test item but the information that he has composed is incorrect for Test Item #3. Subsequently, 3 students (9.37%) are able to compose what they have understood from and what has been asked by the test item but the information that they have composed is incorrect for Test Item #4. Last but not the least, 8 students (25.00%) are able to compose what they have understood from and what has been asked by the test item but the information that they have composed is incorrect for Test Item #5.

With regards to the fourth indicator in the problem identification and understanding skills, 2 students (6.25%) do not compose what they have understood from and what has been asked by the test item for Test Item #1 and Test Item #4 respectively. Then, one student (3.12%) does not compose what they have understood from and what has been asked by the test item for Test Item #2 and Test Item #3 respectively. Last but not the least, 3 students (9.37%) do not compose what they have understood from and what has been asked by the test item for Test Item #5.

b. The Problem Solution Planning Skills of the Students in the Experimental Group

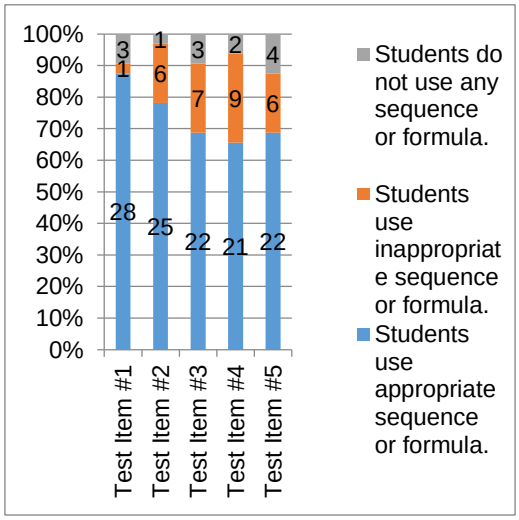

Figure 7. Description on the Problem Solution Planning Skills of the Students in the Experimental Group

From the description in Figure 7, it can be concluded that in overall the students in the experimental group can plan the problem solution for the given context. The statement can be confirmed by the frequency and the percentage of the students in the performance of each test item. The highest figure of the problem solution planning skills is found in Test Item #1 in which 28 students (87.50%) are able to use

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appropriate sequence or formula. As a matter of comparison, 1 student (0.31%) does not use any sequence or formula Test Item #1, while 3 students (9.37%) do not use any sequence or formula for Test Item #3. On the contrary, the lowest figure of the problem solution planning skills is found in Test Item #4 in which 21 students (65.62%) are able to use appropriate sequence or formula. Meanwhile, 9 students (28.12%) use inappropriate sequence or formula for Test Item #4 and 2 students (6.25%) do not use any sequence or formula for Test Item #4.

c. The Problem-Solving Skills of the Students in the Experimental Group

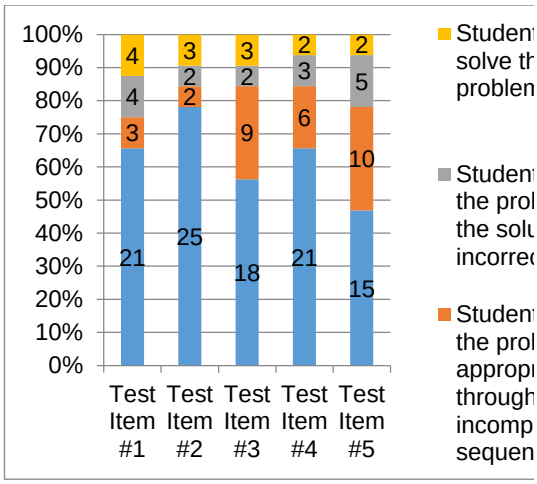

Figure 8. Description on the Problem-Solving Skills of the Students in the Experimental Group

Departing from the results in Figure 8 above, it can be concluded that the students are able to solve the problems in accordance with the plan. The statement can be confirmed by the minimum amount of the students who are able to solve the problems in accordance with the appropriate plan and sequence in each test item. Then, the highest figure of the students who are able to solve the problems through the incomplete sequence is found in Test Item #5 namely 10 students (31.25%). On the contrary, there are 9 students (28.12%) who solve the problems but their solution is incorrect for Test Item #5. Eventually, there are several students who do not solve the problem.

d. The Solution Interpretation Skills of the Students in the Experimental Group

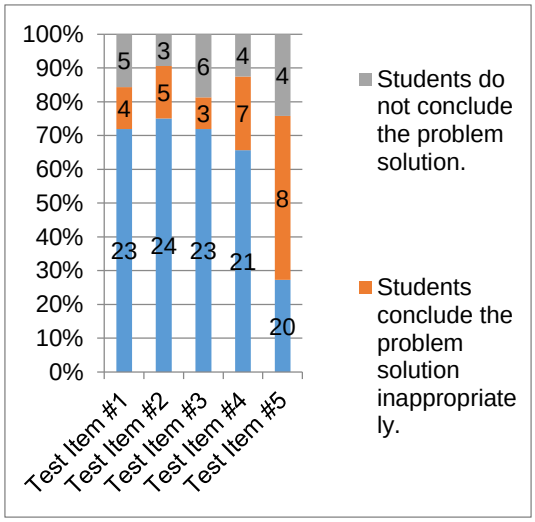

Figure 9. Description on the Solution Interpretation Skills of the Students in the Experimental Group

Departing from the results in Figure 9, it can be concluded that in overall the students are quite able to interpret the solution to the given problems. The statement can be confirmed by the percentage of the students who are able to solve the problem appropriately. However, there are still many students who conclude the solution inappropriately. Unfortunately, there are also some students who do not conclude the problem solution.

Based on the indicators of the problem-solving skills, the mean score of the results can be elaborated in Table 6 below.

Table 6. The Mean Score of the Mathematical Problem-Solving Skills for the Students in the Experimental Group

Indicators of Mathematical Problem-Solving Skills	Mean Score	Category
Problem identification skills	80.62	Very Good
Problem solution planning skills	82.50	Very Good
Problem-solving skills in accordance with the plan	78.33	Good
Solution interpretation skills	78.12	Good

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Indicators of Mathematical Problem-Solving Skills	Mean Score	Category
Overall skills	80.06	Very Good

Referring to the results in Table 6, it is found that: (1) the mean score of the problem identification skills is 80.62, which belongs to the "Very Good" category; (2) the mean score of the problem solution planning skills is 82.50, which belongs to the "Very Good" category; (3) the mean score of the problem-solving skills in accordance with the plan is 78.33, which belongs to the "Good" category; and (4) the mean score of the solution interpretation skills is 78.12, which belongs to the "Good" category. The complete data and calculation for the mean score of the students' mathematical problem-solving skills in the experimental group can be viewed in Appendix XXV.

1. *Test Results of the Mathematical Problem-Solving Skills for the Students in the Control Group*

The description on the mathematical problem-solving skills for the learning materials of Social Arithmetic in the control group is based on the indicators of the problem-solving skills namely problem identification, problem solution planning, problem-solving skills in accordance with the plan, and solution interpretation skills. The description thus will be elaborated as follows.

a. The Problem Identification Skills of the Students in the Experimental Group

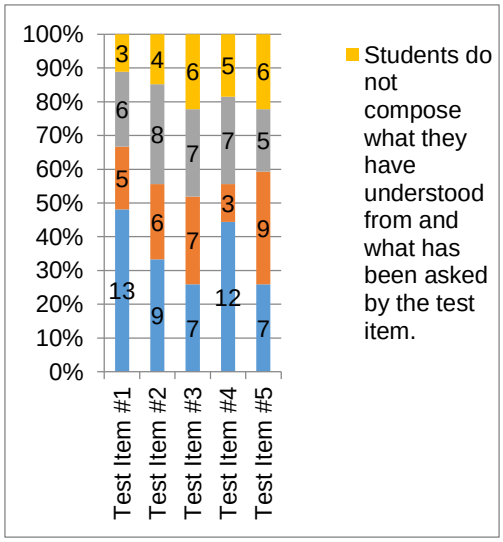

Figure 10. Description on the Problem Identification Skills of the Students in the Control Group

Paying attention to the results Figure 10, it can be concluded that in overall the students are less able to identify the problems. The statement can be confirmed by the highest figure of the students who are able to compose what they have understood from and what has been asked by the test item completely and appropriately, namely Test Item #1 with 13 students (48.14%). Following this, there are 5 students (23.80%) who are able to compose what they have understood from and what has been asked by the test item appropriately but the information that they have composed is incomplete, 6 students (28.57%) who are able to compose what they have understood from and what has been asked by the test item but the information that they have composed is incorrect, and 3 students (14.28%) who do not compose what they have understood from and what has been asked by the test item. Meanwhile, the lowest figure of the students who are able to compose what they have understood from and what has been asked by the test item completely and appropriately is found in Test Item #3 and Test Item #5 with 7 students (33.33%).

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b. The Problem Solution Planning Skills of the Students in the Control Group

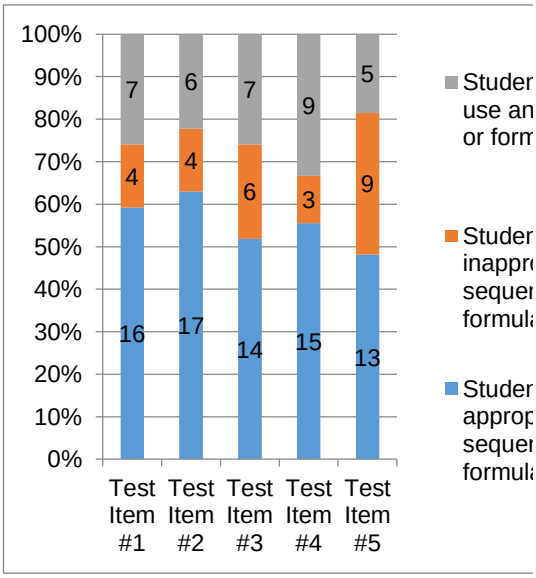

Figure 11. Description on the Problem Solution Planning Skills of the Students in the Control Group

Based on the results in Figure 11, it can be concluded that in overall the students are able to plan the problem solution. The statement can be confirmed by the frequency and the percentage of the students in each test item. In each test item, the students are able to use the appropriate or relevant formula. Then, the problem solution skills of the students are found to be the highest in Test Item #2 in which 16 students (76.16%) are able to use the appropriate formula. Following this finding, 4 students (14.81%) use inappropriate formula for Test Item #1 and 7 students (25.92%) do not use any formula. On the contrary, the problem solution skills of the students are found to be the lowest in Test Item #5 in which 13 students (48.14%) use appropriate formula. Eventually, 9 students (33.33%) use inappropriate formula and 5 students (18.51%) do not use any formula.

c. The Problem-Solving Skills of the Students in the Control Group

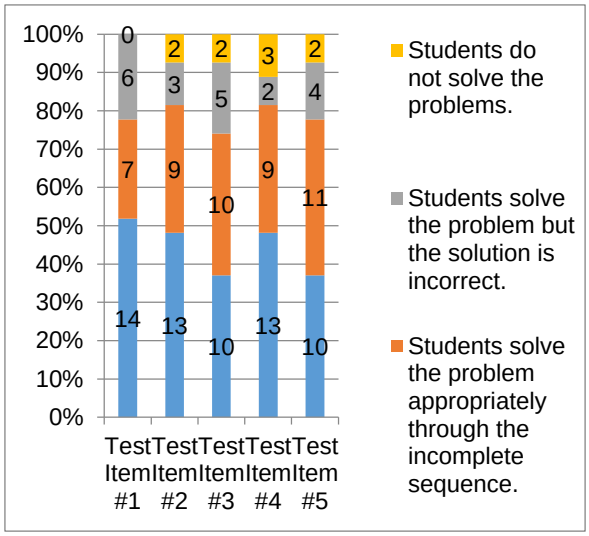

Figure 12. Description on the Problem-Solving Skills of the Students in the Control Group

Based on the results in Figure 12, it can be concluded that the students are quite able to solve the problem in accordance with the plan. The statement can be confirmed by the few numbers of the students who are able to solve the problem appropriately through the complete sequence in each test item. Then, 11 students (40.74%) are able to solve the problem appropriately through the incomplete sequence, while 6 students (28.57%) are able to solve the problem but the solution is incorrect. Furthermore, there are also some students who do not solve the problem at all.

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d. The Solution Interpretation Skills of the Students in the Control Group

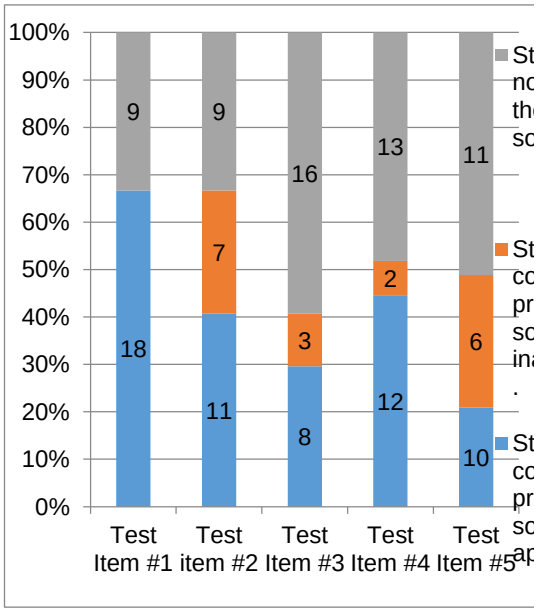

Figure 13. Description on the Solution Interpretation Skills of the Students in the Control Group

Departing from the results in Figure 13, it can be concluded that in overall the students are quite able to interpret the problem solution. The statement can be confirmed from Test Item #1 in which 18 students are able to conclude the problem solution appropriately. However, there are still many students who conclude the problem solution inappropriately while the other students do not conclude the problem solution at all.

The mean score of the mathematical problem-solving skills in the students based on the indicators of the problem solution skills are as follows.

Table 7. The Mean Score of the Mathematical Problem-Solving Skills from the Students in the Control Group

Indicators of Mathematical Problem-Solving Skills	Mean Score	Note
Problem identification skills	59.01	Moderate
Problem solution planning skills	66.29	Good
Problem-solving skills in accordance with the plan	71.35	Good
Solution interpretation skills	49.62	Poor
Overall skills	69.13	Poor

Based on the results in Table 7 above, it is found that: (1) the mean score of the problem identification is 59.01 with the "Moderate" category; (2) the mean score of the problem solution planning skills is 66.29 with the "Good" category; (3) the mean score of the problem-solving skills in accordance with the plan is 71.35 with the "Good" category; and (4) the mean score of the problem solution skills is 49.62 with the "Poor" category. In overall, the mean score of the mathematical problem-solving skills for the students in the control group is 69.13 with the "Good" category.

2. T-Test

Since the data have been normally distributed and homogenous, the researchers proceed to the T-test. Based on the calculation results, it is attained that Sig.(2-tailed) is 0.001 < 0.050. Consequently, H_o is accepted and H_a is rejected. Therefore, it can be concluded that there has been significant difference between the students in the experimental group and the students in the control group on the final test results of the problem-solving skills.

Discussions

Departing from the post-test data analysis results, the mathematical problem-solving skills between the students in the experimental group and the students in the control group are significantly different. In other words, the students who have been exposed to the SCAMPER Technique with the Resource-Based Learning Model have significant improvement in comparison to the students who have been exposed to the Conventional Learning Technique on the materials of Social Arithmetic over the discussions of Profit and Loss. Not to mention, the mean score of the final test results for the students in the experimental group is 80.06 whereas the mean score of the final test results for the students in the control group is 69.13. The gap between these mean scores is 10.93, which confirms that there has been significant difference

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between the experimental group and the control group. These findings are in accordance with the results of the study by Sabrina Ayunda Maulidania, which show that the problem-solving skills of the students who have been provided with the SCAMPER Technique belongs to the "Very Good" category whereas the problem-solving skills of the students who have been provided with the Conventional Learning Technique in the control group belongs to the "Good" category.

According to the researchers, the final test results of the experimental group is higher than those of the control group. Despite the significant difference, the numbers of the students in the control group vary for each meeting. Not to mention, there are also other possibilities. For example, the technique and the model that the researchers have provided have never been implemented by the teachers. Furthermore, the emphasis on the SCAMPE Technique that the researchers have provided in the learning videos and the learning videos alone are more interesting because of the use of the PowerPoint Presentation Slide.

However, it can be safely assured that SCAMPER is a learning method that can be used implemented for manifesting the maximum potentials of the students since this method triggers the students' creativity and assists the students to deal with the possible challenges in the form of list of general objectives with the curiosity-triggering ideas. In relation to the statement, the results of the study by Hani Cahyati entitled *The Effectiveness of Scamper Technique in Developing the Mathematical Creative Thinking Skills of the Students* show that the SCAMPER Technique has been more effective in developing the mathematical creative thinking skills of the students than the Conventional Learning Technique. This conclusion is supported by the improvement on the proportion of the learning mastery among the students who have been exposed to the SCAMPER Technique before and after the learning process with the mean score 77.50, which belongs to the "Good" category.

Resource-Based Learning refers to all types of learning process that put the students into a direct encounter or situation with a number of learning sources, be it individually or collectively, under a number of learning activities that are associated with the learning sources. With regards to the statement, the results of a study by Aryo Putro Hadiningtyas entitled *The Implementation of Resource-Based Learning as an Effort of Improving the Learning Process Quality and the Learning Results of State Vocational High School 2 Depok Yogyakarta in the Academic Year 2011/2012* show that the implementation of the Resource-Based Learning has been able to improve the student activeness into 40%, the student creativity into 40%, and the learning enthusiasm into 53% for the first cycle. Meanwhile, the implementation of the Resource-Based Learning has been able to improve the student activeness into 63%, the student creativity into 56%, and the learning enthusiasm into 70%. Last but not the least, the implementation of the Resource-Based Learning has been able to improve the student activeness into 83%, the student creativity into 73%, and the learning enthusiasm into 90%.

Departing from the mean score of the mathematical problem-solving skills for the students in the experimental group and the students in the control group, it is found that there has been significant difference based on the indicators of the problem-solving skills on the materials of Social Arithmetic over the discussion of Profit and Loss. The significant difference can be elaborated further as follows.

Problem Identification Skills

In the problem identification skills, the students are expected to be able to Students compose what they have understood from and what has been asked by the test item completely and appropriately. In this case, the mean score of the problem identification skills for the students in the experimental group is 80.62 whereas the mean score of the problem identification skills for the students in the control group is 59.01. The gap between these mean scores confirms that most of the students from the control group are less able to identify the problems in comparison to the students from the experimental group. Based on the analysis on the student worksheet, it is found that the students from the control group dominantly do not compose what they have understood

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from and what has been asked by the test item completely and appropriately.

KESIMPULAN

Based on the study that has been conducted, the researcher can draw several conclusions as follows:

1. The problem-solving skills of the students with the SCAMPER Technique and the Resource-Based Learning Model for the learning materials of Social Arithmetic in Grade VII State Madrasah Tsanawiyah 3 the City of Banjarmasin belongs to the "Very Good" category with the mean score 80.06.
2. The problem-solving skills of the students with the Conventional Learning Technique for the learning materials of Social Arithmetic in Grade VII State Madrasah Tsanawiyah 3 the City of Banjarmasin belongs to the "Good" category with the mean score 69.13.
3. There has been significant difference on the problem-solving skills between the students who have been exposed to the SCAMPER Technique with the Resource-Based Learning Model and the students who have been exposed to the Conventional Learning Technique for the learning materials of Social Arithmetic in Grade VIII State Madrasah Tsanawiyah 3 the City of Banjarmasin.

Departing from the results of the study, the researchers would like to propose several recommendations as follows:

1. For the teachers of Mathematics, the SCAMPER Technique with the Resource-Based Learning Model can be implemented as an alternative for their teaching-learning activities be it in the online learning context and the offline learning context.

For the schools, it is expected that the SCAMPER Technique with the Resource-Based Learning Model can serve as a reference in creating the learning process and improving the school quality through the students' learning achievement and the teachers' performance especially the performance of the Mathematics teachers.

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