IMPLEMENTATION OF THE PLAY-THINK-PAIR-SHARE (PTPS) LEARNING MODEL FOR ELEMENTARY SCHOOL STUDENTS TO MASTER PART OF TOP SKILL 2020

Zakirman, Lufri, Khairani, Chichi Rahayu, UNP Padang, Indonesia

Abstract—To improve elementary school student problem-solving skills can be used play-based learning. Playing activity opens the opportunity to set up a Play-Think-Pair-Share (PTPS) learning model in elementary school learning to prepare students to master the 2020 top skills, one of which is a problem-solving skill. The type of research conducted is a quasi-experimental. Data collection instruments in the form of research sheet assessment of problem-solving skills of students and instruments belonging to CFSD year 2018. The data analysis techniques used are test paired T-test samples assuming the data has been distributed normal and homogeneous. Based on the value of Sig. (2-tailed), it can be concluded that Ho is rejected and Hi is accepted. That means there are significant differences in problem-solving skills between students who learn using PTPS and conventional models.

Index Terms—Model Pembelajaran, Play, Think, Pair, Share, PTPS, Top Skill

1 INTRODUCTION

The main purpose of education is to make changes and to educate students to improve the quality of life. The changes that will be made relating to the aspects of the conscious and well-planned business to add insight and knowledge so that it has competence that can be used in the future. Today's formal education continues to educate students to prepare to be able to compete in increasingly competitive competition [1,2]. The international policy document of the last few decades brings up terms relating to sustainable development. Education is referred to as the key to sustainable development in the UN document in 1992 [3]. The concept of education began to evolve and relate to independent thinking and to pay great attention to how students learn. Learning is related to how to improve student skills. Many skills can be trained in developing student competence. The skills in question include critical thinking, discussing, communicating, problem-solving and collaborating [3]. Problem-solving skills are one part of the top skill in 2020 that needs to be developed and owned by students [4]. Solving the problem required a reasoned skill to find a solution as well as analyzing ability. Training of students' analytical skills can be accomplished by implementing troubleshooting steps that can be used to find a way out of a problem. Students are involved with real problems by confronting them at the exploration stage, guiding them to recognize conceptual issues, and guiding them to plan ways to tackle the problem [5]. The research results of students' problem-solving skills at elementary school level have been implemented by Neslihan in 2018, which finds the fact that students' problem-solving skills are still low, one of which is caused by less participation of students in learning activities [6]. If attributed to Indonesia, the conclusion to the student problem-solving skills assessment results can be seen based on the results of TIMSS. The observation of TIMSS results in 2015 in particular for the assessment at the elementary school level, indicating that Indonesia is in the bottom 4 position [7]. The problems tested in the TIMSS assessment are the reasoning questions that demand high-level thinking skills and student problem-solving skills. Based on the results of TIMSS 2015, it can be concluded that students' problem-solving skills are still in the low category. Low student problem-solving skills are caused by several factors, including:

1. Low motivation and student participation in exposing problems
2. Lack of books or activity on problem-solving in learning
3. Lack of problem-solving practices during class
4. Inadequate exercise in the problem unit [8]

To improve student problem-solving skills, a model can lead students to improve their problem solving skills. One of the learning designs that can improve student problem-solving skills is an active learning model [9]. Problem-solving skills can be improved by not forgetting the reference principles of learning in elementary school. One of the principles of learning that has not been integrated into learning activities in elementary school is the principle of learning while playing. In the application of learning models, teachers can design introductory learning activities that match the students' developmental stages. At the elementary school level, students are actively learning when there is the insertion of a play in learning [10,11]. This play-based learning activity is effective as it actively engages students [12, 13, 14], and this level of involvement can be sustained while implementing some of the elements that the teacher directs. In addition, there is evidence that emphasizes game-based learning as a collaboration between students and teachers leads to positive academic outcomes [13.15]. Playing offers many advantages such as practicing problem-solving skills, honing investigating skills, controlling and hence highly recommended as a way to foster children's intellectual skills [11.16]. Playing contributes to cognitive development in several ways. Playing helps the children develop the imagination and memory that are important to think past, present, and future [17,18]. Playing allows children to practice problem-solving skills and decision-making, two essential elements of cognitive development. Playing can have an important role in developing a child's creative ability. The development of creativity is also related to cognitive development because creative thinking contributes to problem-solving. Through the game, children learn how to cooperate with others, helping children understand and
Playing helps children to know about new things, become a fundamental means by which they learn new skills and management skills as well as develop problem-solving skills [19]. Among the early researchers who explored the use of games for early development was Piaget, whose constructivism was identifying the game as a way that individuals could integrate new information into their schemes that already have [20]. Vygotsky considered playing the main source of builders in the school years [21]. Playing activity opens the opportunity to set up a Play-Think-Pair-Share (TPPS) learning model in elementary school learning to prepare students to master the 2020 top skills, one of which is a problem-solving skill.

1.1. Problem-Solving Skills as Part of Top Skill 2020
Learning is expected to be directed to train analytical thinking (learners are taught how to make decisions) instead of mechanistic thinking (routine with just listening and memorize alone). The learning process can be matched with a scientific process. It is believed to be the path to development and development of attitudes, skills, and knowledge of learners. This learning condition will also direct learners to have problem-solving skills [22]. Problem-solving is defined as a person's ability to address a problem, the necessary process of overcoming the difference between the desired situation and the current situation in a situation affected by a variable encountered or not found before [23, 24, 25]. To guide learners to solve complex problems, proper teaching support must be administered and integrated into learning environments [26, 27, 28]. Solving a problem means finding the whole logical possibility of finding answers to a problem. 5 criteria must occur in implementing a problem-solving situation, namely: a problem should be able to develop students' knowledge; Students have basic knowledge in resolving problems, but at the same time can not solve problems in such a known manner; Using more open questions; To know difference students ' understanding, problems need to be expanded; Assisting the development of students ' learning independence [29]. Problem-solving is one of many skills that began to evolve in the early years and continued over the lifetime, contributing to the development of knowledge [30, 31]. Problem-solving is a basic skill that needs to be developed in the students. Siegler stated that children in elementary school-age could be trained in problem-solving skills, but he assumed that the problems raised in learning were simple [32]. In his book titled Creativity and Sustainability, Munandar also said that problem-solving skills can be improved on the level of elementary students. With proper delivery techniques, problem-solving can be given to students since elementary school and can be used in various subjects [33]. Problem-solving skills are important to be developed because problem-solving skills help the child to understand himself, others, the environment as well as a long life skill [34].

Teachers can help improve the skills of solving children's problems with some help, including modeling roles, declaring in relationships, integrating problems in the form of playing activities [34, 35].

1.2. Elementary School Learning
In its development phase, Piaget classify children's growth stage into 4 phases, including sensorimotor, preoperative, concrete operation and formal operational

<table>
<thead>
<tr>
<th>No</th>
<th>Stage of developmental</th>
<th>Age (years)</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sensorimotor</td>
<td>0-2 years</td>
<td>In this phase, the child builds an understanding of this world by coordinating the sensory experience</td>
</tr>
<tr>
<td>2</td>
<td>Preoperational</td>
<td>2-7 years</td>
<td>The child begins to explain the world with words, drawings, and paintings</td>
</tr>
<tr>
<td>3</td>
<td>Concrete Operations</td>
<td>7-11 years</td>
<td>In this stage, children can carry out operations, and logical reasoning replaces intuitive thoughts as long as reasoning can be applied to specific and concrete examples</td>
</tr>
<tr>
<td>4</td>
<td>Formal Operations</td>
<td>&gt;11 years</td>
<td>At this stage, the individual is more beyond the concrete experience and think in abstract and more logical terms. As part of thinking more abstract, teenagers create a shadow of the ideal situation</td>
</tr>
</tbody>
</table>

Elementary school-age children are at a concrete operational stage. At this stage, the child is still in need of concrete objects to help develop their intellectual abilities. At the end of the concrete operational phase, they have been able to understand multiplication, writing, and correspondence, and can start thinking simple abstract, for example understanding the concept of weight, style, and space. Children begin to solve specific problems, learn skills, and logical thinking capabilities that help them to experience. This stage is the
development of a pre-operative phase that begins with the internalization process through the five senses to the brain [37]. The children's learning Tendency has three features: concrete, integrative, and hierarchical [38].

The age of elementary school belongs to the late childhood that lasts from the age of 6-11 years and is at a concrete operational stage. Child characteristics of this age are like playing, having great curiosity, easily affected by the environment, and keen to form and interact with groups/peers. To make learning at the elementary level more effective, teachers need to consider the following principles of learning:

1. The principle of motivation is a teacher's effort to foster a learning impulse both from within the child or from the child's self
2. The principle of the background is the teacher's effort in the process of teaching-learning to pay attention to the knowledge, attitudes, and skills that children have
3. The principle of centering attention is the effort to focus the child's attention by raising problems in learning
4. The principle of problem-solving is a learning situation where students are faced with problems
5. The principle of discovering is the activity of digging the potential of the child's own to seek, develop its results in the form of information
6. Principles of Learning while working, i.e. activities are undertaken based on experience to develop and gain new experience
7. Principles of social relations, learning activities should pay attention to social relations such as learning with peers or with groups
8. The principle of learning while playing is an activity that can create a pleasant atmosphere for the child. By playing knowledge, attitudes, skills and children's fantasies can develop so that it will create active participation of children in learning [39]

For psychology experts, the end of childhood (elementary school students) is often referred to as the age of play. It is based on the breadth of interest and playing activities as well as the magnitude of potential and time for children to play [40]. Jean Piaget classifies the playing stage in children into four categories:

1. A motor sensory game, the age range of 3 months to 1/2 years
2. Symbolic game, age range 1 – 7 years
3. Games that have rules, age range 7 – 11 years
4. Game with sports nuance and rules [41]

Looking at the age and the developmental stages of play, elementary students who are at the age of 7 – 12 are fond of games that have rules. The game in question is a game that is composed of the involvement of adults with children as active participants of the game [42]. Playing offers many possibilities to control, investigate, hone students' problem-solving skills and therefore highly recommended as a way to cultivate children's intellectual skills [43]. Play is a vehicle for learning children and serving important functions including allowing children to become active explorers [42]. It has been well documented that the game supports the development of a child's ability to solve problems, regulate themselves, and their communication skills, all of which are crucial to the child's social and academic success in later [44].

1.3. Play-Think-Pair-Share (PTPS) Learning models
Implementation of the PTPS model begins with playing activities, where the main focus in this playing activity is to facilitate students to know the problems that will be discussed in the learning activities. At the play stage, students perform activities that begin with the process of observing, waiting and trying. Games raised in learning activities using the PTPS model to improve student problem-solving skills is a challenge-based game. The goal of this challenge is to train students to solve problems. The group of students who successfully solved the challenge and became the fastest group in completing the game was made as a winning group.

The syntax integration playing "Play" in the PTPS model is visible in table 3.

<table>
<thead>
<tr>
<th>No</th>
<th>Syntax</th>
<th>Description of activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Play (observe, ask and try)</td>
<td>The teacher invites students to join a game, where the main goal of the game is to practice student problem-solving skills.</td>
</tr>
<tr>
<td>2</td>
<td>Think (reasoning)</td>
<td>Teachers guide students to reason about activities related to problem-solving on play activities</td>
</tr>
<tr>
<td>3</td>
<td>Pair (communicating)</td>
<td>Teachers ask students to discuss with a friend to check the truth of the information expressed on the think</td>
</tr>
<tr>
<td>4</td>
<td>Share (communicate)</td>
<td>The teacher directs the student to communicate the outcome of the discussion on the activity of the pair in front of the class</td>
</tr>
</tbody>
</table>

Learning using the PTPS model syntax has accommodated the theory of constructivist learning. Constructivist theory-based learning is characterized by the activity of students who have been aware of their knowledge such as by conducting research, experiments or identifying and collecting information independently. The constructivist theory began to draw from play activities, where to solve problems in the form of games raised in the learning activities, students actively conduct search and exploration of information. At the stage of thinking "Think" Also students were directed to answer the questions that later directed the student to new knowledge.

With the addition of play syntax on the PTPS learning model is expected to motivate students, increase participation, interests, and problem-solving skills of students. Games raised in learning activities with PTPS models have several characteristics, including:

1. Appropriate game type to improve problem-solving skills is a challenge-based game. If the teacher wants to improve other aspects such as motivation can use the type of verbal games or games involving images.
2. The selected game must use the competition element so that the students actively carry out all activities in earnest
3. In the IPA material group, the material relating to physics is the most relevant topic and according to the type of challenge-based game.
4. The key of the game is time management, meaning in
the selection of the game the teacher must select the game design so that the game's completion time is not more than 10 to 15 minutes

2 METHODOLOGY
The type of research conducted is a quasi-experimental study with samples involved in the study is class VI students of elementary school. The treatment of the PTPS model was given to class VI students enrolled at SDN 20 Nan Sabaris in the 2019/2020 school year. Data collection instruments in the form of research sheet assessment of problem-solving skills of students and instruments belonging to CFSD year 2018. The data analysis techniques used are test paired T-test samples assuming the data has been distributed normal and homogeneous. The hypothesis to be tested in this study is as follows:
• Ho : There are no significant problem-solving skill differences between students who learn using PTPS and conventional models
• Hi : There are significant differences in problem-solving skills among students who learn using PTPS and conventional models.

With the provisions of Ho rejected if the value of Sig (2-tailed) is greater than the equivalent of significance (α = 0.05)

3 RESULT AND DISCUSSION
The data collection instruments in this study are the assessment sheets of student problem-solving skills. Analysis of data in research using test paired sample T-Test by previously conducting a prerequisite test that is a test of normality and homogeneity test. Test normality using the Kolmogorov-Smirnov test and for the testing of data homogeneity using the Levene test. Calculation result for a test of normality and homogeneity of data as follows:

<table>
<thead>
<tr>
<th>No</th>
<th>Variables</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mean</td>
<td>62.39</td>
</tr>
<tr>
<td>2</td>
<td>Std. Deviation</td>
<td>8.219</td>
</tr>
<tr>
<td>3</td>
<td>Absolute</td>
<td>0.119</td>
</tr>
<tr>
<td>4</td>
<td>K-S Z</td>
<td>0.505</td>
</tr>
<tr>
<td>5</td>
<td>Sig. (2-tailed)</td>
<td>0.960</td>
</tr>
</tbody>
</table>

Data will be normal when the value of Sig. (2-tailed) is greater than the alpha value (0.05). Based on the test results of the research data homogeneity, the value of Sig. (2-tailed) is greater than the value of 0.05. Inconclusive Data group assessment of student problem-solving skills between before and after the use of the PTPS model has been homogeneous.

<table>
<thead>
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<th>No</th>
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<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Mean</td>
<td>71.083</td>
</tr>
<tr>
<td>2</td>
<td>Std. Deviation</td>
<td>12.251</td>
</tr>
<tr>
<td>3</td>
<td>Std Error Mean</td>
<td>2.042</td>
</tr>
<tr>
<td>4</td>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Based on the value of Sig. (2-tailed) in table 6, it can be concluded that Ho is rejected and Hi is accepted. That is, there are significant differences in problem-solving skills between students who learn using PTPS and conventional models. The PTPS Model applied can improve and prepare the student to have one part of the 2020 top skill. PTPS models excel in the gameplay syntax aspects not owned by other models. It supports the strength and features of the PTPS model which is suitable for implementation in elementary school learning. The child's world is a world of the play, in children's lives, most of his time spent playing activities. The Greek philosopher Plato was the first to realize and see the importance of gameplay on the child. Children will be easier to understand arithmetic through playing situations. Playing can be used as a container to improve certain skills and abilities in children. The meaning of play can be considered as activities undertaken using or without the use of tools aimed at providing information, giving pleasure, vehicles to the material, and can develop reasoning ability Children's thinking [46]. Playing is an activity undertaken by children, involving the active role/participation of each child, having a systematic relationship with the things of development of reasoning, logic, thought, interaction and adaptation to the environment. Integrating the game in a learning activity is one step that can improve the active participation of the child and have a match with both cognitive and affective stages of development. The game can help children improve their thinking skills, collaborations, problem-solving skills, and spatial perception skills and visualizations [47.48]. When participating in a game students get the opportunity to improve physical, emotional, and social characteristics [49.50]. In carrying out the game, there is something fun, however serious, involving competition to achieve a certain goal and obey the rules. The game requires the strategy, tactics, and initiative of the player (students). Therefore, there must be winners. The game is invaluable for encouraging social skills, collaborative skills, stimulating discussions, developing strategies to learn new concepts, strengthening skills and concepts as an aid for symbolization and logic, and Help with understanding development. The implementation of the PTPS model has the potential to promote student engagement, increase interest and create a sense of mutual need and practice problem-solving in each group [51]. Play is undoubtedly an ideal scenario for the child to acquire learning in a variety of ways [52]. Playing has been shown to provide a strong environment for learning and they motivate children to learn even those who are not initially interested in the subject matter or regard the content as being the hardest to understand.
PTPS models allow students to train and develop soft skills in the form of problem-solving. As it has been known that problem-solving skills are one of the important parts of the 2020 top skill. By playing, students are invited to think and solve problems. A recommended challenge-based implementation in the application of the PTPS model to train problem-solving skills students have proven successful to be applied in the elementary School of Padang Pariaman, West Sumatera, Indonesia. In the future, you will be expected to have even more game innovations that teachers can build to improve their top skills in other parts such as collaboration and creativity.

4 CONCLUSION

Based on the results of the discussion in this study, it can be concluded that:

1. PTPS Model is proven in theory and practice can improve the problem-solving skills of students who are part of one of the top skill in 2020.
2. In the implementation of the PTPS model to improve student problem-solving skills, the most suitable type of games applied is a challenge-based game

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REFERENCES


