

COOPERATIVE LEARNING MODEL OF STUDENT TEAMS ACHIEVEMENT DIVISION OF ACTIVE, CREATIVE, EFFECTIVE AND FUN BASED LEARNING ON SCIENCE SUBJECT

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ABSTRACT:

A research about the development of learning set applying cooperative learning model of STAD of Active, Creative, Effective, and Fun Learning-based on science subject at elementary school has been conducted. This research aims to describe the implementation result of learning set applying cooperative learning model of STAD of PAKEM based Learning. It is implemented to improve the quality of science learning process at school. This is a research and development applying four-D model design. Its implementation on-site applies one-group pretest-posttest design. The data collection method is conducted through observation, test and questionnaire distribution. The validity analysis result of learning set shows that the learning set being developed is in accordance with the planning direction, valid and can be used to measure students' learning outcome. The result of data analysis reveals that lesson plan works well and in accordance with students' planning and activity which emerge in cooperating or communicating, asking, respecting others' opinion, contributing idea or opinion; which are the characteristics of cooperative learning model of STAD of Active, Creative, Effective and Fun Learning-based. This is supported by students' learning outcome which is 100% complete, as well as the

average of students' interest and motivation towards the lesson, are good.

Keywords: Cooperative learning model of STAD; PAKEM.

INTRODUCTION:

The implementation of cooperative learning model in learning process aims to improve learning quality and students' learning outcomes. In fact, teachers do not thoroughly understand the cooperative learning model. The lack of a teacher's understanding of the learning model causes more use of the lecture method, consequently the students are less motivated and interested towards the given lesson.

Aside from the lack of teacher's understanding of learning model and the advantage and objective of learning set development. It can be seen from the number of teachers who only compose a learning set if the supervision is conducted by the supervisor from Department of Education, as if the objective of learning set making is a complementary tool for the administration of teacher's accountability towards supervisor and school's principal.

The lack of a teacher's understanding towards learning model drives the researcher to conduct research about learning set development by implementing cooperative learning model Active, Creative, Effective and Fun Learning-based. Some of the advantages of

learning set development by implementing learning models, according to Yusuf, et al. (2009, 2013, 2014, dan 2015) among others are to show improvement in students' learning outcome, students' activities in learning process, and students' excitement towards the learning model implemented by the teacher. Similar to Yusuf et al. Agustiningsih (2009) states a similar concept by implementing multi-methods in learning process.

The research aims to describe the quality and the implementation of learning set, which being developed by implementing cooperative learning model Active, Creative, Effective and Fun Learning-based.

PAKEM stands for Active, Creative, Effective, and Fun Learning. Active means that during the learning process, teacher has to create certain circumstance thereby students can actively think, ask questions, express ideas, experiment, put theory into practice, and be creative. However, one thing that turns a concept into concrete is when the students learn something firsthand and actively figure out a concept as part of learning objective from experience. For instance, students figure out the meaning of addition after getting involved in addition operation using real objects (red beans, gravels, paper clips). Other examples, students understand the concept of democracy after getting involved in the implementation of democracy and discussion principles in class leader election, which seriously designed by teacher. Real experience and implementation process show the way to actively build students' understanding regarding the concept of addition and democracy.

Cooperative learning model is one form of learning constructivism-based. Cooperative learning is a learning strategy with a small group of students who have heterogeneous capabilities (Isjoni, 2007). Eggen and Kauchak (1996) states that cooperative learning as "a number of teaching strategies used by teacher

to make students help each other in learning something." The cooperative learning model is also known as peer-teaching.

According to Thompson and Smith (1995), in cooperative learning, students collaborate in small groups, and every group member is responsible for the completeness of the group's assignment and studies the material that is tasked to her or him. Wasis, et al. (2002) states that cooperative learning is developed based on constructivism learning theory, which underscores the nature of learning's socioculture, in which the higher mental function generally emerges in the conversation or collaboration between individuals before the higher mental function is absorbed into the individuals.

Cooperative learning model creates a learning revolution in the class, thereby no more quiet class during the learning process. Students in a small group can help each other to complete academic learning materials (Nur, 2008). According to Ibrahim, et al. (2005), the cooperative learning model is developed to achieve at least three objectives; academic learning outcome, acceptance towards pluralism, and social skill development.

Based on the above-mentioned explanation regarding cooperative learning, it can be concluded that cooperative learning requires collaboration among students to achieve objectives and interdependence in task achievement structure and achievement in a group. The success of the learning depends on individual success within the group, in which individual success is very meaningful to achieve positive objectives in the study group.

Table 1. Phases in Cooperative Learning Model of Student Teams Achievement Division of Active, Creative, Effective and Fun Learning-based (PAKEM)

Phase	Teacher's Activities
Phase 1 Conveying learning objectives and information	Teacher conveys learning objectives and information to students through demonstration or picture.
Phase 2 Organizing students in study group and distributing learning materials	Teacher explains to the students how to form a study group and work in a group which can bring efficient change as well as distributes students' worksheets and learning media
Phase 3 Guiding students in study group	Teacher guides students in cooperative study group
Phase 4 Guiding students to publish their work	Teacher guides students to publish group work through class exhibition
Phase 5 Evaluation	Teacher evaluates students' learning achievement levels both individually and in a group.
Phase 6 Giving recognition/appreciation	Teacher gives appreciation to students for their work and effort both individually and in a group.

RESEARCH METHOD:

The method applied in this research is Research and Development (R&D). This method is selected to develop a learning set and data collection in different kinds of aspects. In addition, this method supports the implementation of learning set development process. The design of learning set development applied a 4-D model developed by Thiagarajan (1974), which is known as Four-D Models consisting of the following stages: determination, designing learning set, testing, and dissemination.

The research was conducted in elementary schools throughout Suwawa Selatan Sub-district, Bone Bolango District, to the population of 102 students of grade V and 21

students (20% out of the population) as the samples who were picked at random. The process of data collection was conducted through observation method to observe teacher's activities in learning management; test, to observe the completeness of students' learning outcome; and questionnaire distribution, to observe students' responses towards the applied learning model.

The collected research data were analyzed through descriptive statistics in the form of table, percentage, and graph. The result of data processing is discussed narratively by comparing the result and theory.

FINDING AND DISCUSSION:

Finding:

The Result of Learning Set Development:

The result of learning set development is validated by competent two experts in a related field. Learning sets which are validated are Lesson Plan, Student Book, Student Worksheet, and Learning Outcome Test. The validation experts validate the learning set which includes format, language, and content. The validation result is in the form of a score as the quality of learning set, which is developed; correction and suggestion function as the consideration material and study by a researcher to improve learning set that has been developed.

The evaluation result by the validation experts towards the learning set, which has been developed is shown in table 2.

Table 2. The Result of Validation of Learning Set Feasibility

No	Rated Aspects	Result of the Evaluation of Validation Expert			
		V1	V2	Average	Category
1	Lesson Plan	4.31	4.71	4.51	Very Good
2	Student Book	3.72	3.84	3.78	Good
3	Student Worksheet	4.45	4.45	4.45	Good
4	Learning Outcome Test	4.37	4.75	4.56	Very Good

The result of learning set validation in table 2 shows that the average validation score in lesson plan from two validation experts is 4,51 with a very good category. The validation expert also provides improvement suggestions regarding indicator determination and learning objectives. The improvement suggestion regarding indicator; there are indicators which are not in accordance with developed questions, and there are still additional inputs to the indicator.

The validation result of student book and worksheet feasibility shows that each validation expert categorized the evaluation into a good category, therefore student books and worksheets which are developed by the research are feasible to be utilized on science learning at grade V of elementary school. There is improvement suggestion for student books regarding the writing method especially on pictures' remarks, and the font has to be appropriate with students' age. The improvement suggestion for student worksheet is there are some questions which are not representative to measure learning objective achievement and the editorial instruction for learning activities is less appropriate.

The average result of feasibility validation of learning outcome test is in a very good category, therefore the learning outcome test which is developed can be used to measure students' learning outcome. The improvement suggestion regarding learning outcome tests is the use of language in which the words are ambiguous, and some questions are difficult for students to understand.

The Result of Learning Set Implementation:

The implementation of learning set using the cooperative learning model of Student Teams Achievement Division of Active, Creative, Effective, and Fun Learning-based (PAKEM) is in elementary schools throughout Suwawa Selatan Sub-district, Bone Bolango District with 102

students of grade V as the research subject. In the process of data analysis, the samples are picked at random which are 21 students; 20% out of the total of students.

Learning implementation is conducted for three meetings. The observed aspects of the learning process are learning management and students' skill activities. These aspects are observed in order to view the practicality of learning set that has been developed. After the learning process, students are given a questionnaire and learning outcome test. This is conducted in order to observe the effectiveness of the learning set that has been developed.

Learning management during learning activities using the cooperative learning model of Student Teams Achievement Division of Active, Creative, Effective, and Fun Learning-based (PAKEM) is observed by two observers. The average score of every implementation aspect of lesson plan in learning activities is divided into four categories; 1,00 – 1,49 = low; 1,50 – 2,49 = fair; 2,50 – 3,49 = good; and 3,50 – 4,00 = very good.

Table 3. Result of Learning Management Evaluation

No	Rated Aspect	Average of Observer's Evaluation		
		Lesson Plan 1	Lesson Plan 2	RPP 3
I	Preparation	3,50	4,00	3,50
II	Implementation			
	Phase 1	3,75	3,50	3,50
	Phase 2	3,25	3,75	3,75
	Phase 3	3,50	3,75	4,00
	Phase 4	3,60	3,17	3,60
	Phase 5	3,50	3,50	3,75
	Phase 6	3,33	3,50	3,50
III	Time Management	3,50	4,00	4,00
IV	Class Circumstance	3,50	3,75	4,00
Reliability		99,25	96,30	98,57

The result of data analysis of lesson plan implementation presented in table 3 shows that

the average of observers' evaluation of each aspect towards learning management ranged from 3,17 to 4,00 or from good to very good category. The average of instrument reliability is from 96,30 to 99,25% above 75%, and thereby it is in good category.

Students' skill activities, which are observed by the observers comprised of four aspects; asking questions, giving ideas or opinions, collaboration or communication, and appreciating friend's ideas or opinions. Observation is conducted individually, and in a group, however, the evaluation is still given individually.

Table 4. Percentage of Students' Skill Activities

No	Students' Skill Activities	Percentage (%)			
		Lesson Plan 01	Lesson Plan 02	Lesson Plan 03	Average
1	Asking questions	50.60	52.98	59.52	54.37
2	Giving ideas or opinions	55.95	52.98	57.14	55.36
3	Collaboration or communication	84.52	86.90	83.33	84.92
4	Appreciating friend's ideas or opinions	81.55	86.31	85.71	84.52
Reliability		96.68	99.27	98.27	98.07

The result of data analysis presented in table 4 shows that the most frequent students' skill activities during learning process using cooperative learning model of Student Teams Achievement Division of Active, Creative, Effective and Fun Learning-based (PAKEM) is collaboration and communication 84,92% and appreciating friend's ideas or opinions 84,52%.

The reliability of observation instrument of student's skill activities for each lesson plan is averagely 98,07% or good category. According to Borich (1994), the observation instrument is categorized well if the reliability is $\geq 75\%$.

Completeness of Student Learning Outcome:

Learning outcome test is conducted to find out the level of learning set that has been implemented. Learning outcome test subsumes the completeness of student's learning outcome

and learning objective. The analysis result of learning outcome test on field trial is briefly presented in Table 5.

Table 5. Completeness of Student Learning Outcome Hasil Belajar Siswa

No	Student's Code	Score		Proportion		Completeness	
		U1	U2	U1	U2		
1	A	35.00	91.00	0.35	0.90	T	T
2	B	28.00	76.00	0.28	0.75	T	
3	C	32.00	89.00	0.32	0.88	T	
4	D	17.00	77.00	0.17	0.76	T	
5	E	43.00	99.00	0.43	0.98	T	
6	F	42.00	92.00	0.42	0.91	T	
7	G	34.00	88.00	0.34	0.87	T	
8	H	24.00	78.00	0.24	0.77	T	
9	I	20.00	79.00	0.20	0.78	T	
10	J	22.00	84.00	0.22	0.83	T	
11	K	23.00	79.00	0.23	0.78	T	
12	L	22.00	83.00	0.22	0.82	T	
13	M	23.00	78.00	0.23	0.77	T	
14	N	27.00	97.00	0.27	0.96	T	
15	O	20.00	82.00	0.20	0.81	T	
16	P	27.00	94.00	0.27	0.93	T	
17	Q	20.00	77.00	0.20	0.76	T	
18	R	18.00	87.00	0.18	0.86	T	
19	S	26.00	77.00	0.26	0.76	T	
20	T	29.00	82.00	0.29	0.81	T	
21	U	39.00	98.00	0.39	0.97	T	
Average		27.19	85.10	0.27	0.84		

Remarks: U1 = Preliminary test

U2 = Final test T = Complete

Based on the result of data analysis of students' learning outcome test on table 5 shows that 100% of students are complete as the average score is above the minimum standard set by the school; $P \geq 75\%$ for individual completeness, and $P \geq 85\%$ for classic completeness, thereby individually or classically students' learning outcome is complete.

The data analysis result of completeness of learning objective and sensitivity of question item on students' learning outcome shows that the average question proportion increases from 0,28 on the initial test, to 0,85 on the final test while the sensitivity ranged from 0,52 to 0,63

with the average of 0,57. The proportion of learning objective ranged from 0,76 to 0,90 with the average of 0,85. Thus, learning objective has completed, or the percentage is 100%.

Students' Response towards the Lesson:

The data analysis result on the field trial shows that the average score of students' interest toward learning is in good category. Students have high attention to the material being taught in the learning process, and they state that the learning material is relevant to real daily life, they are able to understand the lesson and apply it in daily life, as well as they are satisfied after attending the class.

The result of the field trial shows that the average of students' motivation towards learning is in good category. Students have high motivation on the material being taught using cooperative learning model of Student Teams Achievement Division of Active, Creative, Effective and Fun Learning-based (PAKEM), students state that the learning material is relevant to real daily life, they believe that they can finish the material in the subject and apply it in daily life, as well as they are satisfied after attending the class.

DISCUSSION:

The Quality of Learning Set Development Result:

The learning set which is developed has been validated by two competent experts beforehand. The validated categories are content, format, and language. Learning set, which is validated includes a lesson plan, student book, student worksheet, and learning outcome test.

The result analysis of lesson plan validation on format, content, and language indicates that the average score of validation feasibility of the lesson plan given by each validation expert is good and very good. This reveals that the components in the lesson plan

arrangement have properly fulfilled. Likewise, the analysis result of validation expert on teaching material also obtains the same evaluation with some suggestions for revision such as misprinting, font, and adding pictures to motivate students to study, and thereby they can easily understand the material being taught.

The analysis result of student worksheet validation indicates that the student worksheet, which is developed is in accordance with drafting standard and can guide students in independent or group study during the class. Learning outcome test which is developed by the researcher is 10 questions in subjective form. The result of the feasibility validation of learning outcome test indicates that the questions are valid and understandable.

The analysis result of learning set validation and the average of evaluation are in good and very good category, thereby the learning set which is developed is feasible to be used as learning set using cooperative learning model of Student Teams Achievement Division of Active, Creative, Effective and Fun Learning-based (PAKEM).

The Implementation of Learning Set:

The learning set which has been developed is validated, then limited tested and field-tested. The trial is conducted to observe the quality of developed learning set. It is indicated with the quality of lesson plan implementation using parameter in learning management level, level of students' skill activities during the class, level of students' learning outcome completeness after the class, as well as students' response towards the implementation of cooperative learning model of Active, Creative, Effective and Fun Learning-based (PAKEM) during the class.

Learning management on limited trial obtains that lesson plan implementation in learning management is in good and very good category. Likewise, in learning management on

field trial indicates that all of the learning management phase conducted by teacher or researcher is averagely in good and very good category. This indicates that the learning set which is developed using learning models of Active, Creative, Effective and Fun Learning-based (PAKEM) can be implemented in elementary school of grade V.

Quantitatively it can be stated that there is no negative influence of lesson plan implementation in learning management using learning models of Active, Creative, Effective, and Fun Learning-based (PAKEM). This is supported by the result of the average reliability of the learning management observation instrument on three lesson plans which is bigger than percentage agreement by Borich (1994) that sets the reliability boundary $\geq 75\%$, is a good category. This finding is in line with the idea of Yusuf (2010) which states that teacher can manage to learn by applying cooperative learning models properly.

Students' skill activities during the class, either in limited trial or field trial indicate that students' activity is dominated by discussion and collaboration with friends. Students are also very appreciative towards their friends' ideas and opinions. The disadvantages of the research finding during the learning process are students are not brave enough to ask questions to their friends as well as to express ideas or responses to questions given by other teachers or students. It is expected that in the future, teacher can train students to speak in front of the class, be brave in expressing ideas or feedback. Consequently, there will be a better circumstance to conduct an open discussion.

According to the analysis result, it reveals that there has been interaction in the learning process even though it happened more in small group and students appreciate their friends who express opinions. This can be stated that the teacher is not the knowledge source but more of a facilitator, while students discover more from

their learning outcome. This is in line with the idea of Kemp (1994: 140), which denotes that the interaction between teacher and student and student and student occurred through discussion, observation in a group, accomplishing group task, and reporting the result.

This is supported by Ismasari, et all. (2017) which states that the implementation of cooperative learning model of Student Teams Achievement Division influences significantly towards students' activities. Isjoni (2007: 20), denotes the characteristics of cooperative learning: (1) every member has a role, (2) there is direct interaction among students, (3) every group member is responsible for his/her study and friends in their group, (4) teacher assists in developing group interpersonal skills, and (5) teacher only interacts with the group when needed.

Students' Learning Outcome:

The data analysis result on individual and classical completeness in limited and field trial indicates the score obtained by the students varied from 75,00 to 100. Referring to the set individual and classical completeness criteria in schools throughout Suwawa Selatan Sub-district, which is $\geq 75\%$ for individual completeness and $\geq 85\%$ for classical completeness, therefore individually, 96% students made it in limited trial and so did in the field trial. This result shows that the implementation of the cooperative learning model of Active, Creative, Effective, and Fun Learning-based (PAKEM) on science subject which has been developed can help students complete their learning outcomes and help those with low academic capability. This is in line with the research of Wardana et all (2017) which claims that the implementation of the cooperative learning model of Student Teams Achievement Division can improve students' conceptual understanding.

The data analysis result of learning objective completeness and sensitivity of question item on limited trial and field trial indicates that the average proportion of students correct answer increase from preliminary to final test, with the sensitivity score estimated from 0,25 to 0,85. This is classified as a good category, based on the explanation of Kardi (2000: 137) that an effective question is the one that answered correctly by the students more after the class.

Students' Response towards the Lesson:

The result of data analysis on students' interest indicates that learning implementation applying a cooperative learning model of Active, Creative, Effective and Fun Learning-based is averagely in good category. This reveals that cooperative learning model of Student Teams Achievement Division of Active, Creative, Effective and Fun Learning-based (PAKEM) can evoke students' interest to study science, thereby science subject becomes an appealing subject, important and has relevance in daily life and more importantly it enables students to achieve learning outcome completeness. This is in agreement with Nur (2001: 48), which denotes that evoking student's interest is important to convince students. The appealing material which will be presented makes students believe how the knowledge will be useful to themselves.

The statements given in the questionnaire subsume the negative and positive sentences. Generally students agree that the problems given in science subject stimulate their curiosity. It shows that the teacher has urged students curiosity through the cooperative learning model of Student Teams Achievement Division of Active, Creative, Effective and Fun Learning-based (PAKEM). According to Nur (2001: 49), the teacher has to apply various ways to evoke or maintain students' curiosity during the class.

The data analysis result about students' motivation reveals that the average of students' responses in learning applying cooperative learning model of Student Teams Achievement Division of Active, Creative, Effective, and Fun Learning-based (PAKEM) is in good category. It describes that applying cooperative learning model of Student Teams Achievement Division of Active, Creative, Effective, and Fun Learning-based (PAKEM) can evoke students' motivation to learn science, it can make science subject appealing to students and enables students to achieve the desired learning outcome. Students state that science learning material is important and beneficial for daily life, students believe that they can finish the material in class and implement it in daily life, and eventually they are satisfied with the lesson after science class. It can be stated that the teacher succeeds in applying learning set using the cooperative learning model of Student Teams Achievement Division of Active, Creative, Effective, and Fun Learning-based (PAKEM), thereby the learning set evokes students' motivation towards science learning.

CONCLUSION:

The data analysis result of limited trial research and field trial in the implementation of learning set applying cooperative learning model of Student Teams Achievement Division of Active, Creative, Effective and Fun Learning-based (PAKEM) is:

1. Learning set produced in science subject on grade V at elementary schools by implementing cooperative learning model of Student Teams Achievement Division of Active, Creative, Effective, and Fun Learning-based (PAKEM) is a lesson plan, student book, student worksheet, learning outcome test. The learning set is feasible to be applied based on the validation result by the validation experts.

2. The implementation of developed learning set applying cooperative learning model of Student Teams Achievement Division of Active, Creative, Effective and Fun Learning-based (PAKEM) is effective to be applied at grade V of Elementary schools

In conclusion, the developed learning set by applying the cooperative learning model of Student Teams Achievement Division of Active, Creative, Effective, and Fun Learning-based (PAKEM) can help complete students learning outcomes in a science subject at grade V of Elementary School.

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