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The Implementation of Three-Stage Fishbowl Decision to Improve Students Conceptual understanding and Learning Activity

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Abstract

The purpose of this research were to improve the student activities and conceptual understanding using three-stage fishbowl decision strategy in pressure subject. This research design was the pretest-posttest control group design. The sample of this research was 65 students of 8th grade that was determined by using purposive sample method. The data were collected by test, observation, and documentation. The data was analyzed by using gain-test and one tail t-test. The gain-test was obtained that the activity and students understanding of pressure concept for experimental group was increased in medium level, whereas for control group in minimum level. The one tail t-test was obtained that the activity and students understanding of pressure concept for experimental group were better than control group.

Keywords: three-stage fishbowl decision, conceptual understanding, learning activity, pressure concept

Penerapan Strategi Three-Stage Fishbowl Decision untuk Meningkatkan Pemahaman Konsep dan Aktivitas Belajar Siswa

Abstrak

Tujuan penelitian ini untuk meningkatkan pemahaman konsep dan aktivitas belajar siswa dengan menggunakan strategi *three-stage fishbowl decision* pada materi tekanan. Desain penelitian ini adalah *pretest-posttest control group* desain. Sampel pada penelitian ini sebanyak 65 siswa kelas VIII yang diambil dengan menggunakan metode *purposive sampling*. Data dikumpulkan dengan menggunakan tes, observasi dan dokumentasi. Analisis data menggunakan uji gain dan uji t satu pihak. Analisis uji gain menunjukkan peningkatan pemahaman konsep dan aktivitas belajar siswa berkategori sedang untuk kelas eksperimen dan rendah untuk kelas kontrol. Analisis uji satu pihak menunjukkan bahwa pemahaman konsep tekanan dan aktivitas belajar siswa kelas eksperimen lebih baik dibandingkan kelas kontrol.

Kata kunci: *three-stage fishbowl decision*, pemahaman konsep, aktivitas belajar, konsep tekanan

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INTRODUCTION

There are two synergy activities in a learning process. First, teachers give a lesson and second, students do a study. Teachers give a lesson how students have to study, while students learn how they should do study through the learning experiences. Student activity in the learning process is one way to turn the students' memory on. **Kennedy (2007)** declares that active learning is an instructional method that invites students to take a part in a learning process. Active learning is more reemphasize to make a learning that students can do meaningful learning activities and then they can think about it. If teachers can make a learning that can involve students to take part on it actively, so the students will try to do a lot of activities that can help them to understand the subject concept.

Active learning is student centered approach, not teacher centered approach. **Indrawati and Wawan (2009)** explain the types of active learning: (1) teacher is a facilitator, (2) the learning focus is student, not teacher, (3) the students study actively, (4) the student can control the learning process and they can create their own work, not copy from the teacher, and (5) the learning process is interactive. The kind of student activities in student centered learning are role playing, writing with their own words, group discussion, problem solving, discussion or debate, practicing, and doing inquiry. **Abidin (2005)** declares that active learning is more involve students to learn together, make an interaction and communication, collaboration and share each other.

The implementation of active learning strategies can create student learning activities that have criteria: (1) be own master and direct themselves on it, (2) make an active participation on group activity, (3) be critical and creative, (4) make a collaboration, (5) do an activity and experience it, and (6) do an evaluation. **Yerigan (2008)** found that active learning strategy can make students participation increase until 75%. It can make students stay away from bothersome attitudes (screaming out, running out, leaving the class and not doing the task). **Kane (2004)** explains that the successful point of active learning depends on the plan. The method that use will be working if it is supported with a good lesson plan. It has to appropriate with the learning purposes. The teacher as a good facilitator have to be able to make students learning ability appears and grow up as long as learning process. **D'Silva (2010)** concludes that active learning emphasizes a depth learning, an experienced learning, a lifetime learning, and a comprehensive learning. **Cherney (2008)** states that the concept in active learning is remembered better. If it is connected with the students and their real life, it will be increases the students understanding.

Learning activity is an activity that going to do to produce a conceptual change, attitude values, and student skills. In **Hamalik (2007)**, Paul D. Dierich divides learning activity into eight activities, there are: 1) visual activities (reading, look at the pictures, experiment observe, demonstration, look at other people who work or play); 2) oral activities (propose a fact or principle, connect an event, propose a question, give a suggestion, propose an opinion, hold an interview, and discussion); 3) listening activities (listening, providing a material, listening a conversation or group discussion, listening to the music instrument, and listening of radio); 4) writing activities (writing a story, writing a report, making a vignette, enclosing, doing a test, and filling a questionnaire); 5) drawing activities (making a graph, chart, map, and pattern); 6) metric activities (doing an experiment, choosing the tools, doing an exhibition, making a model, doing a simulation, dancing, and farming); 7) mental activities (contemplating, remembering, problem solving, factors analyzing, finding the relations, and concluding); and 8) emotional activities (interest, discrimination, braveness, composure, etc). **Prince (2004)** explains that a good activity will be build a deep understanding about important ideas that learned. The activities have to well-designed that appropriate to learning purpose and can actualize the student thinking participation. **Zwier (2007)** concludes that someone will learn more

effective when they discuss a topic actively through practical and realistic activities, so students and teacher can understand the topic well.

Three-stage fishbowl decision is one of discussion and debate type that applicable in learning process. It is held as follow: First, divide the students into three groups or more. First group as first expert group has to discuss the topic and the other group as viewer or listener. Second, make some of the class chairs into circle to make a fishbowl, and make the residual chairs draw around of it. Third, after the first expert group finish their discussion on fishbowl, one of the other group take the place of the first expert group on fishbowl and they have to discuss the other topic that given on fishbowl as second expert group. Each group have same chance to be expert group and viewer or listener group. **Kennedy (2007)** explains that debate class gives a chance the students to be active and it can increase the conceptual understanding (improve their critical thinking ability, oral communication ability, and empathy). **Walker (2003)** founds that discussion and debate class can increase student's critical thinking ability. Based on that researches, it can be concluded that active learning by using discussion and debate class gives a chance to students to show their ability up. This research was implementation of active learning with three-stage fishbowl decision in physics especially in pressure topic. This research was combined the three-stage fishbowl decision strategy with the demonstration and discussion sheets. This research aims to improve the conceptual understanding and learning activity of students through implementation of three-stage fishbowl decision strategy.

METHODS

The population of this research was students of 8th grade in SMP Negeri 1 Gajah. This research sample was using purposive sampling method. This research was using 65 students. This research was quasi experiment. The research design was using pretest-posttest group design. The data were collected by using documentation, test, and observation. Three-stage Fishbowl Decision was applied in experiment group, lecture and simple discussion was applied on control group. The test instrument was analyzed using validity test, reliability test, discrimination power, and level of difficulty. The data of student understanding was obtained from pretest and posttest. The normalized gain test <g> was used to know the increasing of student's conceptual understanding. The effectiveness of active learning with three-stage fishbowl decision strategy was tested. The one tail t-test was used to compare the students understanding between experiment and control class. The data of students learning activity was obtained by using an observation. The learning activity of students was analyzed using percentage distribution, the normalized gain-test <g>, and one tail t-test for correlated sample.

FINDINGS AND DISCUSSION

The data of student conceptual understanding was obtained by using written test twice (before and after the implementation of three-stage fishbowl decision strategy). Table 1 shows the pretest-post test data recapitulation.

Table 1. The Pretest and Posttest Recapitulation of Students Conceptual Understanding

Variation Source	Experiment Group		Control Group	
	Pretest	Post test	Pretest	Post test
Average	40.78	68.56	45.58	61.82
Maximum Score	60	87	70	77
Minimum Score	20	50	23	47
Deviation Standard (s)	9.41	9.63	10.91	7.76
Variant (s^2)	91.09	95.66	119.06	60.28

Table 1 shows the results of pretest and prosttest for experiment and control groups. The average of pretest and posttest for experiment are 40.78 and 68.56 respectively, whereas for control group are 45.58 and 61.82 respectively. The maximum and minimum scores of experiment group are better than control group although the both of range scores are same.

Table 2. The Gain-test Result of Students Conceptual Understanding

Variation Source	Experiment Group		Control Group	
	Pretest	Posttest	Pretest	Posttest
Average (%)	0.408	0.686	0.456	0.618
Gain <g>	0.469		0.298	
Criteria	Medium		Low	

Based on the normalized gain-test, the conceptual understanding increasing result of experiment and control groups are shown at Table 2. The gain score of experiment and control groups are 0.469 and 0.298 respectively. The criteria of conceptual understanding for experiment group is in medium level, whereas for control group is in low level. Table 2 shows that the implementation of active learning with three-stage fishbowl decision strategy in experiment group is better than control group.

Table 3. The Effectiveness Test Result of Experiment and Control Groups

Group	Average	*df*	$t_{observation}$	t_{table}	Criteria
Experiment	68.563	31	2.094	2.03	Significant
Control	61.818	32	-2.354	2.03	Significant

T-test was used to examine the effectiveness of active learning with three-stage fishbowl decision strategy to the student conceptual understanding. It was compare the average of student conceptual understanding with KKM (minimum passing criteria) score that has 65 minimum score. The t-test result is shown at Table 3. Based on this table, the tests show that active learning with three-stage fishbowl decision strategy is more effective to increase the student conceptual understanding than lecture learning with discussion.

Table 4. The One Tail T-test Result of Conceptual Understanding in Experiment and Contol Groups

Group	Average	Variant	*df*	$t_{observation}$	t_{table}	Criteria
Experiment	68.563	92.641	63	3.533	1.665	Experiment group is better than control group
Control	61.818	60.278				

Table 4 shows that one tail t-test acquires $t_{observation}$= 3.533 and t_{table} = 1.665 with degree of freedom = 63 and the significant level 5%. Because of $t_{observation} > t_{table}$ (3.533 > 1.665), so H_o is unaccepted and H_a is accepted. It means that the student conceptual understanding of experiment group is better than control group.

Table 5. The Initial and Final Observations Recapitulation of Student Learning Activity

Variation Source	Experiment Group		Control Group	
	Initial	Final	Initial	Final
Average	19.69	43.88	16.79	24.15
Maximum Score	31	58	23	38
Minimum Score	13	17	12	15
Criteria	Not good	Good enough	Not good	Less good

The student learning activity was obtained by using an observation (seeing, listening, writing, and asking aspects). Table 5 shows the data recapitulation of student learning activities. Based on Table 5, the final average of student learning activity for experiment and control groups are 43.88 and 24.15 respectively. The maximum and minimum scores of experiment goup are better than control group. Table 5 shows the criteria of student learning activity for experiment group is good enough, whereas for control group is less good. The observation data of student activity improvement was analyzed by using the normalized gain test <g> and the result is shown at Table 6.

Table 6. The Gain-test Result of Student Learning Activity on Experiment and Control Groups

Variation Source	Experiment Group		Control Group	
	Initial	Final	Initial	Final
Average (%)	0.197	0.439	0.168	0.242
Gain <g>	0.301		0.088	
Criteria	Medium		Low	

Table 6 shows the average of student learning activity for experiment group is better than control group. The gain–test result of student learning activity for experiment group is 0.301 in medium level and for control group is 0.088 in low level. Based on Table 6, it is concluded that the learning activity of experiment group that using active learning with three-stage fishbowl decision strategy of experiment group is more effective than control group.

Table 7. The one tail t-test result of Student Learning Activity

Group	Average	Variant	*df*	$t_{observatio}$	t_{table}	Criteria
Experiment	43.875	102.565	63	9.887	1.665	The student learning activity of experiment group is better than control group
Control	24.152	26.570				

Table 7 shows that the one tail t-test result of student learning activity is $t_{observation}$ = 9.887 and t_{table} = 1.665 with degree of freedom = 63 and level of significant = 5%. Because $t_{observation} > t_{table}$, so H_0 is unaccepted and H_a is accepted. It means that the student learning activity of experiment group is different and better than control group. It can say that active learning with three-stage fishbowl decision strategy is more effective to increase the student learning activity than the traditional and discussion learnings.

This research result shows that the student conceptual understanding by using active learning with three-stage fishbowl decision (in experiment group) is better than the lecture and discussion learning (on control group). Figure 1 shows a graph about the comparison of conceptual understanding between experiment and control groups.

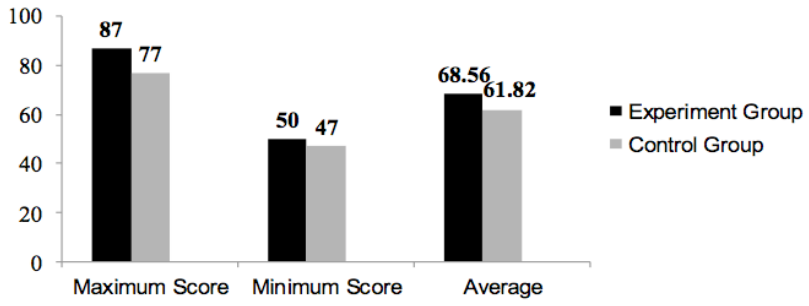

Figure 1. The comparison of Posttest Result between Experiment and Control Groups

Active learning with three-stage fishbowl decision strategy that was applied in experiment group is designed to give a lot of chance for student to create their own knowledge based on the information that they get. Active Learning involves student to thinking what they see, what they hear, and what they do. **Murdoch and Paul (2010)** explain that active learning in group design is more effective if it is applying in small class that large class. This research finds that active learning in group design (especially in this research uses three-stage fishbowl decision) can applies in large class. The strategy that was used in this research is designed to appropriate with group discussion and demonstration. The student average score of experiment group is 68.56. The student average score of control group is 61.82. The average score of experiment group is higher than control group. It means that active learning with three-stage fishbowl decision strategy can applies in large class, if the learning is designed precisely. **Kane (2004)** explains that the method will success if it is supported with a good lesson plan that appropriates with the learning purpose and the teacher as facilitator have to be able to make the student learning ability appears and grows up as long as learning process. The combination of demonstration, group discussion and teacher's explanation in the end of class will create a learning that involves student to be a subject in the class, not the object anymore.

Based on the gain-test and one tail t-test show that student understanding of experiment group is different and better that control group. That result means that active learning with three-stage fishbowl decision strategy is appropriate and more effective to increase the student cognitive ability, because it involves student to dominate the class. Students are take a part in the learning process almost. Students invite to pay attention and do a demonstration, do a group discussion, listen to the other group discussion, listen to teacher's explanation, ask, answer the question, make a summary, make a note of teacher's explanation, and engaged in all learning process actively. All learning process of experiment group is designed to make student to dominate in the class. **Zaini, Barmawy, and Sekar (2008)** declares that if student dominates the class, then the learning outcome can be optimized. **Kennedy (2007)** also declares that active learning with discussion and debate can increases the student conceptual understanding. Three-stage fishbowl decision is one of discussion type, that according to **Zaini et al. (2008)** declares that discussion is suitable if the teacher wants to make student builds their critical thinking, to help student formulates an implementation of a principal, to help student understands a problem, and to get a feedback about the learning purpose that wants to reached.

Active learning with three-stage fishbowl decision strategy that was applied in experiment group gives a full responsibility to student to learn, to do something besides they listen to teacher's explanation, and to apply the subject material. It is appropriate with **Silberman (2006)** that learning is an active, student does a lot of activities, student starts to thinking, solves the problem, and applies what they learn. Figure 2 shows the comparison of student learning activity between experiment and control groups.

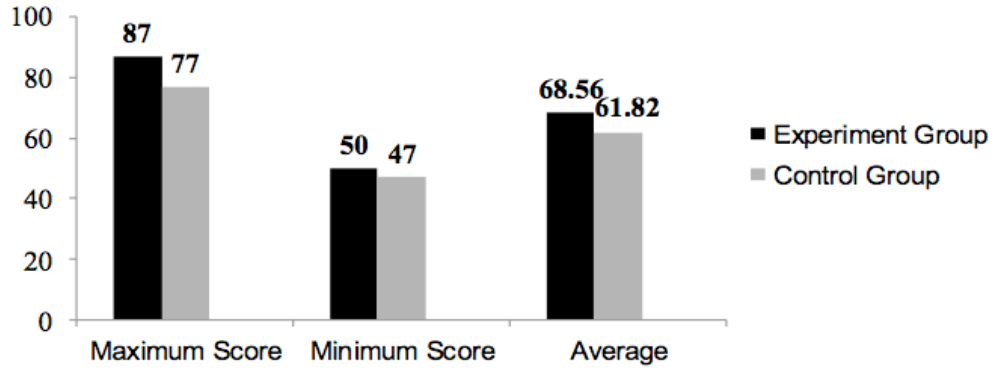

Figure 2. The Comparison of Student Learning Activity between Experiment and Control Groups

The result of gain-test obtains that student learning activity of experiment group is better than control group. One tail t-test concludes that active learning model with three-stage fishbowl decision strategy is more effective and better to increase the student learning activity than lecture and discussion learning. Active learning with three-stage fishbowl decision gives an opportunity to student to do many activities that can support them to get an information and knowledge about pressure concept. A demonstration can involve student to pay attention, to observe and to think what they see. The discussion form of three-stage fishbowl decision gives an opportunity to student to play along with friends, to ask, to think the topic discussion, to think the problem that they found, to suggest an opinion, to train the tolerance attitude to the others, and to listen the others. The activity in active learning is screw student out to be a subject that dominate the learning process with guidance of teacher as facilitator. In **Yerigan (2008)**, Meyer and Jones declares that some activities in active learning (talking and listening, writing, reading, and reflecting activities) can guide to give a meaning of the material, ideas, and a lot of thing that connect the learned topic.

At the beginning, to change the habit of student (from passive to be active) is hard. The student participation at the beginning is still hard, but at the final observation, the student activity is change. There are 12 students (37.5%) in good level of their learning activity, and 16 students (50%) in good enough of their learning activity. That result shows that student starts to be familiar with active learning. It is appropriate with **Yerigan (2008)**, it was reported that students who enjoy their interaction with other will increase their interaction. Although some students have hard experience to change from traditional learning to the interactive and interaction learning. **D'Silva (2010)** conclude that active learning is a learning model that focuses on student learning responsibility, student is allowable to taken part in learning to actualize the higher order thinking. All the learning activities in this research was designed to develop the student ability and to train the student responsibility, so students can create their own knowledge. Student who gets an implementation of active learning shows the increase of learning activity is better than student that gets lecture and discussion learning.

In this research, there are four kinds of learning activity that observed on experiment and control groups. They are: (1) observing activities (observing a demonstration, and discussion), (2) listening activities (listening the teacher's explanation, doing the teacher's instruction, listening their friend's opinion or idea or protest, and gathering the discussion), (3) writing activities (summarizing of group discussion result, summarizing the other group discussion result, and summarizing the teacher's explanation), and (4) oral activities (asking, giving an opinion, and discussion). All that activities were given an assessment using observation paper.

CONCLUSION AND SUGGESTION

First, active learning model with three-stage fishbowl decision that was applied is more effective to increase the student learning activity. Second, active learning model with three-stage fishbowl decision that was applied is better and more effective to increase the student conceptual understanding that lecture learning. Some suggestions for the next research/researcher: (1) needs to make a learning that covering all kind of learning activities, (2) teacher as facilitator has to gives a motivation, a guidance, and attention to passive student, and (3) arrange a simulation before the data collected.

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