

THE IMPACT OF PROBLEM SOLVING ON LEARNING ACHIEVEMENT ON PASSENGER AND GOODS CHECKING COURSES OF SURABAYA AVIATION POLYTECHNIC**Didi Hariyanto, Yatim Riyanto, Andi Mariono and *Fajar Arianto**

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Abstract

Aviation security materials are learning materials that discuss the safety of flight operations and airport facilities. The characteristic of this activity is that it requires a lot of understanding and analysis of problems related to the safety of aviation operations and airport facilities, to be applied in the world of work. So that the purpose of this study is to determine the effect of problem-solving on learning achievement in the Passenger and Goods Inspection course of Surabaya Aviation Polytechnic. The type of research used is an experiment with a pretest-posttest non-equivalent group design, and the subjects are 68 cadets, divided into two groups, experimental and control. The analytical technique used to compare the two groups to find out the difference, using the t-test. The results of the study indicate that there are differences between the two groups which can be concluded that there is an impact of the problem-solving model on the achievement of cadets. The cadets who were treated with the problem-solving model got better achievements than the traditional ones.

Keywords: Problem Solving, Learning Achievement, Vocational Education, Learning Outcomes.

INTRODUCTION

A problem is a situation or some situations in which there are open questions that challenge someone intellectually to want to immediately answer these questions with methods/procedures/algorithms and others that they have (Blum and Niss, 1991). The existence of a problem is something that is not known as the result of a situation where everyone is looking for answers to meet needs or to achieve goals. A problem is a problem that has a feeling of need that can motivate someone to seek the answer (Jonassen 1997). The main focus in learning should be learning to solve problems by Jonassen (2010), so that when there is a gap between the initial statement and the goal to be achieved and there is no solution for the problem solver (Bransford and Stein, 1993). Problem solving is a method that teaches problem solving by placing an emphasis on solving a problem logically. Problem solving method can also be interpreted as a way of presenting lesson material by making problems as a starting point for discussion to be analyzed and synthesized in an effort to find solutions or answers by students (Gulo, 2002), so that there are two requirements that the question is a problem for students, namely: First, question faced by the student must be understandable by student but question must be a challenge for him to answer, and secondly, question cannot be answered with a routine procedure that is already known to the student. This method states that the subject matter is not limited to books but also comes from certain events in accordance with the applicable curriculum. Problem solving is part of problem-based learning (Sanjaya, 2006). Because problem solving is not just a teaching method but also a method of thinking, because in problem solving you can use other methods starting from looking for data to drawing conclusions (Djamarah, 2006). The application of this model certainly has goals that have been designed by educators and school officials for students, including increasing learning achievement. Where learning achievement itself is a mental or psychic activity, mastery of knowledge and learning skills

possessed by students and operationalized in the form of indicators in the form of values. Achievement is the result achieved (from what is done and expected) (Chaplin, 2002), therefore the main focus of learning achievement is the mastery of knowledge and skills developed by the subject, which is usually indicated by the values or numbers given by the subject country. Learning activities in humans can be formulated as a mental or psychic activity that takes place in active interaction with the environment, which results in changes in knowledge and attitude values. The changes are relatively constant and scar. Learning can not only be done at school, but can be done anywhere, such as at home or in the community (Winkel, 1997). Learning is also a process of change from not being able to being able and occurring within a certain period of time (Irwanto, 1997) which ultimately aims to make changes in a person, including changes in behavior, attitudes, habits, knowledge, skills and so on (Mudzakir, 1997). Learning achievement includes five human skills including: 1) verbal information, 2) intellectual skills, 3) discrimination, concrete concepts, abstract concepts, higher rules and regulations, 4) cognitive strategies, and attitudes, and 5) material skills. Learning outcomes in the dimensions of development/achievement of the ultimate goal are greater self-confidence, increased social participation and citizenship, improved work and income, increased use of public services, increased attention to education of family/community members. There are many factors that affect student learning achievement, such as factors that come from outside individual, namely the air condition, study time, the tools that used for learning, the atmosphere in the family, noisy sounds around the study area, and factors that influence the learning process. Comes from within the individual such as physical condition or health in general and certain physiological functions, especially the functions of the five senses, emotional intelligence, attitudes, memory, are the individual's ability to fully control the existence of the self as a whole. To achieve good learning achievement, there are many factors that need to be considered, because in the world of education there are not a few cadets who experience failure. There are many students,

especially cadets who have a strong drive to excel and the opportunity to improve achievement, but in reality the resulting achievements are below their abilities. To achieve good learning achievement, there are many factors that need to be considered, including the characteristics of the students themselves. For prospective students of the Surabaya Aviation Polytechnic cadets, the selection is based on the selection of prospective cadets which is carried out in an integrated manner, namely. For prospective land cadets, prospective sea cadets and prospective air cadets by the Transportation Human Resources Development Agency. Where education and learning are all on campus, starting to learn (theory and practice) sports, arts, eating and sleeping in a boarding school. the characteristics of cadets entering the age of over 17 years where ages 11 years to adults have formal operational characteristics, have abstract thinking patterns and can analyze problems scientifically so that cadets are able to think using logic and systematically to the stage of problem solving. Characteristics of cadets at Aviation Polytechnic, in their ability to think in analyzing the subject matter, the cadets experience weakness in accepting the material presented by the lecturer, so it is necessary to use learning methods in delivering the material that are in accordance with the characteristics of cadets aged 17 years and over. So it is necessary to plan in the application of discipline and problem solving to critical thinking in order that the learning methods to be applied are in accordance with the students. The application of problem solving methods is expected to improve student learning achievement, including the domain of knowledge (cognitive) as thinking skills (reflective, critical, active), skills (psychomotor) which are participation skills (expressing opinions, discussions, questions and answers), and attitudes (affective) as attitude skills (accepting opinions, tolerance, collaboration, responsibility) to improve critical thinking and aviation security learning achievement at Surabaya Aviation Polytechnic.

METHODS

This research is a quasi-experimental study with pretest-post-test non-equivalent group design. Participants in this study were students of the Surabaya Aviation Polytechnic in the first year, there are 68 cadets. Participants were divided into two groups, 34 cadets in the experiment and 34 cadets in the control. The experimental group was treated with problem solving method and the control group with the traditional method, which is commonly used in learning. The analytical technique used is to compare the two groups with a t-test to determine the difference in achievement obtained by the two groups.

RESULTS AND DISCUSSION

The results of data analysis in Table 1, show that there is a significant difference between student achievement through traditional methods and problem solving methods. And in table 2, the results of the independent sample test obtained a sig level of 0.001 (<0.05), it can be concluded that there is a significant difference between learning achievement in cadets who are treated with problem solving model and the traditional one. Cadets who were treated with the problem-solving method obtained better learning achievements than the traditional ones. Problem solving is a method that is more effective in learning mathematics than the traditional method (lectures). Therefore, educators must use problem-solving methods in teaching mathematical concepts to provide knowledge, understanding problem-based learning, and improve student academic achievement (Perveen, 2010).

Table 1. Group Statistics

	Group Prestasi	
	PS	Traditional
N	34	34
Mean	75.09	61.47
Std. Deviation	18.673	11.621
Std. Error Mean	3.202	1.993

In line with this opinion, Damopolii (2018) in his research states that there are differences in the increase in student achievement, where students who learn by using problem solving learning models have a higher increase in learning achievement compared to students who learn by using conventional learning models. Problem solving is a skill that needs to be taught to cadets from an early age. Problem solving always covers all areas of human activity, be it in the fields of science, law, business education, sports, health, industry, literature, and others. Problem solving can be taught in any course, especially in passenger and cargo inspection courses. Learning to solve problems basically means using the scientific method or thinking systematically, logically, regularly and thoroughly. The goal is to acquire cognitive skills and abilities to solve problems rationally, straightforwardly and thoroughly (Muhibbin, 2014). Furthermore, research by Evans (1994) defines that problem solving is an activity related to choosing appropriate actions and changing current situation into necessary atmosphere. This means that at each stage of problem solving, a filter is needed to determine the best way to solve the problem. By filtering the various problems that exist, a person can easily carry out the troubleshooting process of various problems that he faces. Problem solving according to Balley (1989) is defined as a complex activity and a high mental process.

Table 2. Independent Samples Test

		Prestasi		
		Equal variances assumed	Equal variances not assumed	
Levene's Test for Equality of Variances	F	6.618		
	Sig.	.012		
	t	3.610	3.610	
	df	66	55.227	
	Sig. (2-tailed)	.001	.001	
t-test for Equality of Means	Mean Difference	13.618	13.618	
	Std. Error Difference	3.772	3.772	
	95% Confidence Interval of the Difference	Lower	6.087	6.059
		Upper	21.149	21.176

Problem solving is defined as combining bright ideas to form a composite of new ideas, emphasizing reasoning as the basis for combining ideas and leading to problem solving. Also, someone with a lot of experience in a particular field always has an answer in a situation to help solve problem. Problem solving ability is a person's ability to find solutions through a process that involves acquiring and organizing information. Problem solving is about finding workable ways to achieve goals (Santrock, 2011). Anderson (2005) also suggests goal-oriented problem solving, which often involves setting goals to empower people who use them. So, by using a good purpose, a person will be more aware of the situation and conditions when the person is solving the problem. Problem solving is intended so that cadets can use thinking (ratio) as completely as possible with maximum grip. So that cadets are trained to think further by using their thinking skills (Armei, 2002). In general, cadets who think rationally use principles and basic understanding in answering questions and problems. In rational thinking requires cadets to use logic to determine cause and effect, analyze, draw conclusions, even it makes laws (theoretical rules) and predictions. Other goals of problem solving are: 1) Developing thinking skills, especially in finding the cause and effect and purpose of a problem. This method trains cadets how to approach and take steps in solving a problem 2) To provide knowledge and practical skills that are valuable or useful for the needs of daily life. This method provides a basis for practical problem solving experience and these skills can be applied to the needs of dealing with other problems in society (Armei, 2002). Problem solving can train cadets to find information and check the validity of the information with other sources. In addition, problem solving trains cadets to think critically, and this method trains cadets to solve dilemmas. So that by using this problem solving method, cadets will better understand how to solve problems that will arise in real life or outside the school setting.

Conclusion

Problem solving methods affect the performance of cadets. Learning that applies problem solving can be used as an alternative for studying passenger and cargo inspection of Surabaya Aviation Polytechnic cadets because it can make the experience very meaningful and can improve learning achievement in passenger and goods inspection courses, so it needs to be applied to other courses.

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