International Journal of Science and Research (IJSR)
ISSN (Online): 2319-7064
Index Copernicus Value (2015): 78.96 | Impact Factor (2015): 6.391

Critical Thinking and Problem Solving Skills: How these Skills are needed in Educational Psychology?

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Abstract: ***Critical thinking skills and problem solving ability is very helpful in educational psychology courses to train student teachers in solving complex problems of education, especially in the classroom. This study aimed to describe the ability of critical thinking and problem solving ability of students in educational psychology lecture. Methods empirically using a quasi-experimental method with data analysis techniques using quantitative descriptive. Samples in this study were 30 students in the subject of educational psychology. The results showed that the thinking skills of students included in the category sufficient to score an average of 3:06. critical thinking skills based on the indicator indicates that the indicator 3 (I-3) gives a good conclusion is the highest score and indicator 2 (I-2) to build the fundamental skills is the lowest score. Problem solving ability of students included in both categories with an average score of 2.99. Pearson correlation test results (r) between the critical thinking skills and problem solving ability of students did not show a strong relationship even contradictory (-.05). based on the results of data analysis can be concluded that the ability of critical thinking and problem solving ability of students still have to be improved in the future.***

Keywords: critical thinking skills, problem solving ability, educational psychology

1. Introduction

The world of education has always been in the spotlight because of various problems are quite complex over time. Education is important for every country because it can be used as an indicator of progress of the nation. Apart from that, the educational issues require special attention to find a best solution for the purpose of improving the quality of education. The quality of education is inseparable from the role of teachers as educators and facilitators for students. The quality of teachers is determined at the time before becoming a teacher (student teachers), if the student teachers for education or training qualified then later the student will become a qualified teacher.

Student teachers must have good potential in addressing the problems of education in the future. In this study problems associated with critical thinking skills and ability to solve problems in education in terms of the psychology of education. Educational psychology is a branch of science that studies and understanding of teaching and learning in educational environments that examine the behavior and mental processes in education [1,2]. Educational psychology is very suitable to analyze and assess complex matters concerning human behavior through the stages of mental process in this case specifically in the learning process. for it in analyzing and assessing the complexity of education required high-level thinking skills and ability to solve problems.

Critical thinking is an ability of interpretation and evaluation of the process of observation and communication, process the information and arguments put [3.4]. Important critical thinking skills possessed by student teachers in this case the student teachers of biology education in order to understand the psychology students at the time later after becoming a teacher. Critical thinking skills that will help in solving problems, especially regarding the issue of learning in the classroom. Critical thinking is the ability to reason and think reflectively directed to decide matters convincing to do as a self-conscious process that uses a judgment based on the evidence, methods and specific criteria to interpret, analyze and evaluate knowledge [5,6,7] Critical thinking skills are not obtained offhand but through be some process. Critical thinking is a process of assessing self-regulatory aiming to encourage problem-solving and decision-making, or "engine" that drives how we decide what to do or to believe in certain contexts [8,9,10] and can be either mental activity ([11]. According to [12] critical thinking and unfounded must always refer to a different standard called universal intellectual standards. Intellectual universal standard is standardization must be applied to thinking used to check the quality of thinking in formulating the problems, issues, or certain situations.

Solving problems in education, especially in the learning always evolving because of human social nature that continues to change. Teacher, which is spearheading successful learning in the classroom should be able to solve the problems of education, it is related to how teachers can implement educational psychology in learning to understand their students. Problem solving is directed to conduct operations in a systematic procedural so that it can be used as a starting point to search for an answer or a solution to solve the problem [13,14] can also be implemented in solving problems in a case study [9]. According to [15] the problem to be solved can be divided into four kinds, namely (a) linguistic problems (b) non-linguistic problems, (c) well-defined problems, (d) ill-defined problems.

Based on this background, this study aims to describe the ability of critical thinking and problem-solving skills of students in a psychology class education to students majoring in biology education. To focus this research, compiled the following research questions:

1) How critical thinking skills of students in the subject of educational psychology?
2) How is problem-solving skills of students in the case

study?
3) How relationship critical thinking skills and problem solving students' educational psychology?

2. Method

The method used in this research is quasi-experimental methods (quasi experiment) with study design Randomized Control Group Posttest [16] with quantitative descriptive techniques. Quantitative descriptive techniques to explain every phenomenon, symptoms or findings in the study. Samples in this study were 30 student teachers of biology in educational psychology courses. The sampling technique using random sampling techniques [17]:

$$\text{Sampel} = \frac{\lambda^2.N.P.Q}{d^2(N-1) + \lambda^2.P.Q} \quad \ldots\ldots\ldots (1)$$

2.1 Data Collection

The data collection was done by using the test. Mechanical tests for collecting data is done by providing instruments to students in the form of essay questions as much as 5 items to measure students' critical thinking skills and about the form of case studies to measure problem solving skills. About the critical thinking skills developed based framework Ennis in measuring critical thinking skills for each indicator. Each indicator has a maximum score of 4 (scale 1-4). Critical thinking skills that referred to in this study includes several indicators developed by Ennis in between; 1) Provide a simple explanation, 2) Develop basic skills, 3) Summing up, 4) Making further explanation, 5) Strategy and tactics.Left Margin 17.8 mm (0.67")

2.2 Analysis Category

From the data collected in future studies analyzed with descriptive analysis technique quantitative evaluation which describe and interpret each component as compared to the reference criterion is based on the average score ideal (Mi) and the ideal standard deviation score (DSi) is achieved by a sheet instruments. This study uses a questionnaire scale of 5 with the conversion value and scores, determine (Mi) and (DSi) in this study using a formula developed by [18]. Determination (Mi) and (DSi) are presented in Table 1.

Table 1: Conversion Score on a Scale of 5

Value	Score	Criteria
1	$x > (Mi + 1{,}8\ SBi)$	Excellent
2	$(Mi + 0{,}6\ SBi) < x < (Mi + 1{,}8\ SBi)$	Good
3	$(Mi - 0{,}6\ SBi) < x \leq (Mi + 0{,}6\ SBi)$	Sufficient
4	$(Mi - 1{,}8\ SBi) < x \leq (Mi - 0{,}6\ SBi)$	Low
5	$x \leq (Mi - 1{,}8\ SBi)$	Very Low

2.3 Correlation Test

Correlation test is used to Determine the extent to the which the relationship between the identification of the student classification capabilities. This is important Because The ability of identification is the basis of the classification. Correlation test using r test (Pearson correlation test).

3. Result

3.1 Critical Thinking Skills

Critical thinking skills students captured by using about as much as 5 grains by some of the indicators. The results of the data analysis of students' critical thinking skills are described in Table 2.

Table 2: Critical Thinking Skills of Students

	N	Range	Min	Max	Mean
Critical Thinking Skills	30	1.40	2.40	3.80	92.00
Valid N	30				

According to the table 2 can be obtained information that the average score of students' critical thinking skills by 3:06 with a maximum score of 3.8 and a minimum score of 2.4.

Results data analysis of the critical thinking skills of students for each indicator (I-1) Provide a simple explanation, (I-2) Build basic skills, (I-3) Summing up, (I-4) Making further explanation, and (I-5) Strategies and tactics presented in Figure 1.

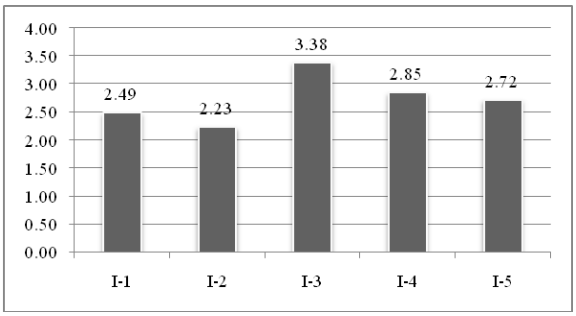

Figure 1: Critical Thinking Skills Students Each Indicator

Based on the first image obtained information that the critical thinking skills of students with the highest scores on the indicator 3 (I-3) gives the best conclusion for 3:38. While critical thinking skills are the lowest in the indicator 2 (I-2) to build the fundamental skills of 2:23.

3.2 Problem Solving Skills

Problem solving skills of students captured by the test in the form of questions about the case in study. data analysis problem solving skills of students is presented in Table 3.

Table 3: Problem Solving Skills of Students

	N	Range	Min	Max	Mean
Critical Thinking Skills	30	2.25	1.60	3.85	89.97
Valid N	30				

Based on Table 3 obtained information that the problem solving skills of students score of 2.99 with a maximum score of 3.85 and a minimum score of 1.6.

3.3 Analysis Category of Critical Thinking Skills

Analysis category is done to see categories of students' critical thinking skills, data analysis categories of critical thinking ability of students is presented in Table 4.

Table 1: Conversion Score on a Scale of 5 of Critical Thinking Skills

Value	*Score*	*Criteria*
1	$x > 3.53$	Excellent
2	$3.24 < x < 3.53$	Good
3	$2.95 < x \leq 3.24$	Sufficient
4	$2.67 < x \leq 2.95$	Low
5	$x \leq 2.67$	Very Low

The average score of students' critical thinking skills of 3:06 is in the range 2.95-3.24, thus the critical thinking skills of students included in the category sufficient.

3.4 Analysis Category of Problem Solving Skills

The results of data analysis categories of problem solving skills of students is presented in Table 5.

Table 1: Conversion Score on a Scale of 5 of Problem Solving Skills

Value	*Score*	*Criteria*
1	$x > 3.4$	Excellent
2	$2.95 < x < 3.4$	Good
3	$2.5 < x \leq 2.95$	Sufficient
4	$2.05 < x \leq 2.5$	Low
5	$x \leq 2.05$	Very Low

The average score of the students problem skills ability of 2.99 is in the range 2.95-3.4, thus the problem solving skills of students included good category.

3.5 Correlation Test

To determine the relationship between critical thinking skills and problem solving skills of students then tested using test-Pearson correlation (r). The results are presented in Table 6.

Table 6: Correlation Test Result

		Critical Thinking Skills	Problem Solving Skills
Critical Thinking Skills	Pearson Correlation	1	-.050
	Sig. (2-tailed)		.792
	N	30	30
Problem Solving Skills	Pearson Correlation	-.050	1
	Sig. (2-tailed)	.792	
	N	30	30

4. Discussion

Critical thinking skills and problem solving skills is needed in the world of education. A student teachers should be able to cope with complex problems ranging from learning, educating students and students studying psychology. Psychology education is closely related to learning where teachers should be able to understand, manage and control their students. In spite of it to understand the psychology of teacher education or student teachers must have a high ability to support the learning process. Teachers who have good critical thinking skills that will be able to organize her class properly, can easily understand the characteristics of each student and have high creativity in learning. in addition, the ability of problem solving should also be owned by teachers DSLAM solve various problems in the learning process. ranging from problems of delinquency, achievement and motivation. Teachers who have good problem solving ability can definitely solve complex problems in education.

Critical thinking ability of students to the highest indicator based on indicator 3 (I-4) which provides a good conclusion. Ability to conclude that good is a good starting point because in this case the student has the ability to interpret, evaluate and communicate the basis of symptoms or a phenomenon. This is in accordance with the opinion of Fisher (2001) suggests that critical thinking is the ability of interpretation and evaluation of observation and communication, information and arguments. It is clear that critical thinking is an active process, through the interpretation of the students will be actively involved in learning, capable of performing evaluations, observations, communicate, and more able to make the argument. Ability to conclude that both are needed in education, especially for The work that psychology students in learning.

Indicator lowest critical thinking skills that the indicator 2 (I-2) to build the fundamental skills of 2:23. This shows that the students' ability to build basic skills is quite low. This is because the basic skills necessary to build a vast knowledge of the student. Poor ability to think and inability to construct the basic concept that they had as initial capital to make the decision to become the cause of the difficulties in building basic skills. This is in accordance with the opinion of some experts and researchers as proposed by [4] further develops thinking skills of a student, the more they learn. The more they learn, the better their ability to think. The same is expressed by Wiessinger [10] states that critical thinking is the development of thinking skills that do not occur naturally and not a fluke of experience or not an automatic product of learning outcomes. Furthermore [11] stated that the constructivist learning and through case studies and problem-based learning will bring students are engaged in learning, which stimulates critical thinking skills and analytical skills of students. Critical thinking skills of students included in the category enough (Table 4) is thus critical thinking skills students need to be increased again by various methods or programs appropriate to resolve the issue.

Problem solving ability of students included in either category (Table 5). It is of course very nice to be developed further. Good problem solving ability will help teachers or student teachers in solving various problems in education, especially in learning. According [13] that the method of problem solving is directed to perform the operation procedural action sequences, stage by stage systematically. A systematic problem-solving instructions to perform an action that serves to help a person in solving a problem. In line with this [14] states that learning model of problem solving is a way of presenting the material to make the subject matter as a starting point for the discussion was analyzed in an attempt to find solutions / answers by students. Problem solving can be viewed as a process in which students find the combination of rules that have been learned in advance that it uses to solve problems and be able to produce a new lesson or learn something new. By applying this method is expected to improve learning and to improve students' learning activities and learning outcomes obtained.

The relationship between critical thinking skills and problem solving ability of students (Table 6) showed negative correlation (-.05). Thus, it can be concluded that the ability of critical thinking and problem solving ability of students does not come with a significant relationship even contradictory. This of course begs the question "what happened?". And we can assume if students have good critical thinking skills course will have the ability to solve the problem well too. But in this study the reality is different. Perhaps this is one of the main weaknesses in this study, the data obtained in the study sample representative less slightly. But this of course will be a matter for further research in the future.

5. Conclusion

Education is a phenomenon that is always interesting to be learned and understood by a variety of complex problems. Related to the educational psychology has an important role in education in overcoming various problems. Apart from that, the ability of teachers or student teachers must have the ability to think critically and problem solving skills that are integrated in learning to overcome the problems of education, especially to understand the psychology of students in learning. critical thinking skills of students in this study included in the category sufficient. this is of course to be in the spotlight in the development of the program of lectures to enhance these capabilities. Problem solving skills of students included in good category. This would be a good starting point for a more developed in the future. Based on these results we recommend various programs, especially in educational psychology. Programs to improve the ability of critical thinking and problem solving skills of students which of course is needed in educational psychology to solve complex problems. Hopefully the results of this study will be a reference and can be developed in the future.

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