

## Critical thinking of extrovert boys in problem solving

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**Abstract.** The purpose of this research is to know the ability of critical thinking of Extrovert Boys in Problem Solving. This research used qualitative descriptive that conducted at di SMP Muhammadiyah 8 and the students of VII grade as subject and the object is critical thinking skill in problem solving. It used Eysenck Personality inventory-A (EPI-A) test for the instrument which conducted in the first meeting to all students, problem solving test was given to 6 extrovert boys and interview. Problem solving strategy used to know critical thinking skill by giving personality EPI-A test in the first meeting on students of VII grades to find respondents, 6 extrovert boys. After finding the respondents, the next step is giving problem solving test. The researcher interviewed the result of respondents. Findings showed that : 1) High critical thinking of extrovet boys werenot success in strategy step, only in alternative solution; 2) Moderate critical thinking of extrovet boys werenot success in strategy step, only in alternative solution, and 3) Low critical thinking of extrovet boys werenot success in inference and strategy step.

### 1. Introduction

One of the aims of learning mathematic is to make the students think critically. Critical thinking cannot be developed by physical development of human being. It must be trained by stimulus giving which encourages students to think critically. School is one of educational institutions which have responsibility to develop critical thinking skill.

Graduate Competence Standard for Elementary and Junior High School Level, there are several competences which related to critical thinking, are 1) Develop, use and apply information about environment logically, critically and creatively, 2) Present the way of thinking logically, critically and creatively, also innovatively. 3) Present the problem solving way, 4) Present the strong desire and realize the potency, 5) Present the independent learning ability [4]. Critical thinking skill could motivate students to acquire and respond the question given in order to slove the problem.

Developing the critical thinking is important for students to explore mathematic ideas which used in problem solving [8;7]. Problem solving is a process to solve the problem [12]. It is essential to do by mathematic's teacher since by giving problem solving mathematic exercise; students could be analytic and critical in deciding a decision and also could applicate it in other situation.

In the fact, based on the research findings which showed the low of critical thinking students [13,9]. It is in line with TIMSS Indonesia students are low in answering the questions which related to justification and proofing, problem solving needs mathematical reasoning, finding generalization and conjecture, then the correlation between the data and the fact.

Ability to solve mathematic problem is affected by several factors, both internal and external. Internal factor is intelligence, motivation, readability, talent and mathematic skill also gender [10]. It is

reinforced by a research entitled Gender Differences in Problem Solving affected to complex variables including biologist, psychology, and environment [14, 6].

Arrends stated that: *“there are differences of cognitive ability between male and female. The males are more rational, has enthusiasm directed to the things that intellect, abstract, such that they are better in logical thinking and more critical”* [1]. It shows that there are the differences between boys’ cognitive and girls’ cognitive. Boys are more logical, and have enthusiasm which leads to intellectual, abstract, therefore, they are better in thinking logically and critically. It showed that the differences of gender also will be different in personality, here the researcher want to know the ability of critical thinking in solving problem based on gender and personality.

Several researches related to critical thinking [3] stated that there is significant gender distinction on Mathematic performance test. Critical thinking ability is effective way to improve students’ understanding about mathematic. Therefore, it is recommended to teach mathematic in senior high school, so the teacher could apply critical thinking skill in curriculum which able to improve students’ performance on mathematic and it is in line with [11] stated that students with critical thinking will be able to think critically as students require all step of critical thinking when solving the problem. [5] stated that there is the differences of thinking process in solving problem based on gender and introvert and extrovert personality.

Therefore, the researcher try to conduct this research focused on the analysis of critical thinking skill in solving mathematic problem based on personality and gender. The differences between this research and previous research is in critical thinking skill.

## 2. Experimental Method

This research used qualitative descriptive that conducted at di SMP Muhammadiyah 8 and the students of VII grade as subject and the object is critical thinking skill in problem solving. It used Eysenck Personality inventory-A (EPI-A) test for the instrument which conducted in the first meeting to all students, problem solving test was given to 6 extrovert boys and interview. Problem solving strategy used to know critical thinking skill by giving personality EPI-A test in the first meeting on students of VII grades to find respondents, 6 extrovert boys.

## 3. Result and Discussion

Based on findings that used problem solving task, the result of score which obtained from extrovert boys is RF, RE, AR, DR, RS and DD.

**Table.1** Critical Thinking Skill of Extrovert Boys

Name	Reading and Thinking	Exploring and Planning	Chose strategy and Find Answer	Reflecting and Developing
DD	Could answer the known, asked clearly and correctly.	a. Could explore the fact on the task. b. able to explain the concept used with own language	a. able to use relevant information for completing the task. b.able to explain the relationship each information. c.had decided what kind of step used in completing the task.	a. Had found alternative solution to answer the task. b. Could not evaluate any completion steps yet. c. could not explain the known completion steps yet
RE	Could answer the known, asked clearly and correctly.	a. had explored the fact on the task. b. had explained the concept used with own language	a. had used relevant information for completing the task. b.able to explain the relationship each information.	a. Had found alternative solution to answer the task. b.able to evaluate any completion steps

<b>Name</b>	<b>Reading and Thinking</b>	<b>Exploring and Planning</b>	<b>Chose strategy and Find Answer</b>	<b>Reflecting and Developing</b>
<b>RS</b>	Could answer the known, asked clearly and correctly.	a. Could not explore the fact on the task. b. Could not explain the concept used with own language	c. had decided what kind of step used in completing the task a. able to use relevant information for completing the task. b. able to explain the relationship each information. c. able to decide what kind of step used in completing the task	c. able to explain the known completion steps a. Had found alternative solution to answer the task. b. Could not evaluate any completion steps yet. c. could not explain the known completion steps yet
<b>DR</b>	Had done answer the known, asked clearly and correctly.	a. had explored the fact on the task. b. Could not explain the concept used with own language	a. able to use relevant information for completing the task. b. able to explain the relationship each information. c. able to decide what kind of step used in completing the task	a. Had found alternative solution to answer the task. b. had evaluated any completion steps c. Had explained the known completion step
<b>AR</b>	Did not answer the known, asked clearly and correctly.	a. Could not explore the fact on the task. b. Could not explain the concept used with own language	a. could not use relevant information for completing the task. b. could not explain the relationship each information c. could not decide what kind of step used in completing the task	a. Could not find alternative solution to answer the task. b. Could not evaluate any completion steps c. Could not explain the known completion step
<b>RF</b>	Did not answer the known, asked clearly and correctly.	a. Could not explore the fact on the task. b. Could not explain the concept used with own language	a. could not use relevant information for completing the task. b. could not explain the relationship each information c. could not decide what kind of step used in completing the task	a. Could not find alternative solution to answer the task. b. Could not evaluate any completion steps c. Could not explain the known completion step

Based on findings from six subject of extrovert boys critical thinking ability in problem solving, were: a) high ability was RE with the result was 75 and DD with the result 80; b) medium ability was DR with the result was 65 and RS with the result was 61,67; c) low ability was RF with the result was 25 and AR with the result was 28.

Based on both findings above, it obtained the findings that extrovert boys with critical thinking in mathematic problem solving were able to pass the reading and thinking step until in choosing strategy and finding the answer step, but it was not on reflecting and developing step. Since boy was on labil situation and more focused on game such as video game, and online game. It was stated in line with the result of research about gender in problem solving affected on many complex variables including biologist, psychologist, and environment [14,6,2].

If it was viewed from personality, extrovert were more doing action before thinking the effect which lead to hurry situation to give answer, therefore it often made mistake in completing the task. It was contrast with finding of Hasanah' research stated that extrovert were more detail [5].

#### **4. Conclusion**

In data analysis which presented in the previous chapter, it could be concluded as follows; (1) High critical thinking skill of extrovert boys passed on clarification, assessment, inference step successfully. While they only gave alternative solution on strategy step; (2) Medium critical thinking skill of extrovert boys passed on clarification, assessment, inference step successfully. While they only gave alternative solution on strategy step; and (3) Low critical thinking skill of extrovert boys passed on clarification and assessment. While they failed on inference and strategy step.

#### **5. Suggestion**

It was expected that this research will contribute idea in developing better education, especially on mathematic: (1) for teacher, the students with extrovert personality are motivated by reward or praise, so the students encourage in learning mathematic; (2) for extrovert boys will not make noisy situation in the class and also they are given any reward or praise to improve their passion in learning mathematic, automatically extrovert girl create conducive learning situation.

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