

# Higher-Order Thinking Skills Of Junior High School Students

*by* Endang Susilaningsih

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## HIGHER-ORDER THINKING SKILLS OF JUNIOR HIGH SCHOOL STUDENTS

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**Abstract:** Essay tests have the ability to interpret the value of individual tests in relation to a set of goals, skills or competencies. The study aims to determine the ability of high-school students to think high. The research was conducted by quantitative technique with 30 samples on small scale test and 105 students on large scale test. Samples were taken randomly from the population. data collection techniques using Tests. Students do not seem too different because they get the ability to answer a short enough question. The results of large-scale test ability of analysis of 43% very high, 26% High, 26% medium, and 6% low. Evaluation ability of 30% very high, 21% high, 20% medium, 29% low, and 1% very low. Create ability 29% very high, 28% high, 41% medium, and 3% low. Analyze and create capabilities have the same percentage for each category. Large-scale tests show an increase in ability of each ability. Decreasing the category is very effective, teachers need to improve their ability and evaluation. Category Low and very low in the category of evaluation. Teachers are encouraged to use learning models that train high-order thinking skills.

### INTRODUCTION

The test is one of the instruments used to collect the information required in the evaluation, consisting of a number of questions or items that are used to obtain data or information through the response of the test participants (Rusilowati, 2017). The item in the test requires the subject to show what is known or what the subject has learned by answering the question (Azwar, 2010, p. 3). Opinion Rusilowati and Azwar in line with the delivered Hamblen and Rogers which states that the tests referred to by the norm are designed primarily to facilitate and compare between individuals or groups about the properties measured in the test. The tests referred to by criteria such as proficiency tests, mastery tests, competency tests, and basic skill tests are built to enable interpretation of individual test scores with respect to a set of clear goals, skills or competencies (Hamblen & Rogers, 2000, p. 4).

Research to compare the effectiveness of essay test forms (descriptions) and multiple choice with the application of Graded Response Model (GRM). The results showed empirically and simulated tests presented in the essay form tended to have a higher functional item information value of the multiple choice. Essay tests tend to be more effective than multiple choice. Test that use larger sample sizes, there is a tendency towards the form of essay tests to have a higher functional value of the information item information than in the form of multiple choice (Sasongko, 2010) (La Fave, 1966).

Essay type tests have the advantage that is relatively easier to make. It is easier to use to reveal a high level of competence. The essay test is able to uncover capabilities related to verbal-write expressions (Azwar, 2010, p. 76). Teachers should be aware that essay tests will result in high-order thinking expressions of learners in lengthy writing, so that items are arranged in small amounts. Essay tests can reveal to remember, understand, and organize ideas or things that have been learned, by expressing or expressing ideas in the form of written descriptions using his own words. Topics taught to require feedback from learners not just choose the answer then it should be developed item (Ridlo, 2011, p. 41).

### Essay Test Characteristics

Assessment in writing is done by written test. Written test is a test that the problem and the answer given to the students in the form of writing. Learners in answering questions do not always respond to the form of writing answers, but can be other forms such as marking, coloring, drawing, and so on (Majid, 2015, p. 190).

There are 2 forms of written test questions, namely:

1. Choose an answer, which is divided into a) multiple choice; b) two choices (right-wrong, yes-no); c) match; d) cause and effect.
2. Supplying answers, differentiated between: a) stuffing or completing; b) short or short answers and c) descriptions / essays.

The preparation of a written assessment instrument needs to consider the following:

1. Characteristics of subjects and breadth of the scope of the material under test.
2. Materials, such as conformity with competency standards, basic competencies, and achievement indicators in the curriculum.
3. Construction, for example, the formulation of questions or questions must be clear and assertive.
4. Language, such as the formulation of the problem does not use words / sentences that give rise to multiple interpretations.

A written essay test requires learners to remember, understand and organize ideas or things they have learned. Learners express or express the idea of the form of a written description using their own words. Specifications of mental processes related to construction and the extent to which learners report awareness and use of processes in academic problem-solving situations (Armour-Thomas et al, 1992). Supardi (2015, p. 48) explains the essay test is a form of question that requires learners to answer in the form of describing, explaining, discussing, comparing, giving reasons, and other similar forms according to the demands of questions using their own words and language.

Essay test has several advantages including:

1. Measuring high mental processes or high cognitive aspects.
2. Develop language skills both orals and written well and correctly in accordance with the rules that apply. Essay tests is effective against improving the achievement of essay test, there is no significant difference between students who have disabilities in reading and writing ability (Therrien et al, 2009).
3. Train the ability to think regularly or reasoning, ie logical thinking, analytical and systematic. Essay tests can show evidence of awareness in the meta-cognitive understanding of the usefulness of feedback and formative assessment procedures (Ellery, 2008).
4. Develop problem solving skills.
5. The existence of technical advantages such as easy to make without requiring a long time.

Essay tests has the characteristics of the question preceded by words such as describing, explain, why, how, compare, conclude, and so on. The question on the essay test form are usually not many, only about 5-10 pieces in about 90-120 minutes. Essay test in short requires students to be able to remember and recognize again and especially must have a high creativity (Arikunto, 2007, p. 162). The ability to write in essay tests may link scores if the level of writing ability in acceptance rather than the placement test of learners (Goodwin, 2016). (Day et al., 1990) essay tests can be constructed covering the domain of clinical judgment. Essay tests results are associated with other clinical competencies, so as to provide information. (Widoyoko, 2016, p. 83) describes the type of essay tests based on the degree of freedom of the test participants to answer the question. Essay tests can generally be divided into two forms, namely: free expression test or extended response and an open description test (restricted response).

- 1) Extended Response Test. The free description test has a form of description test that gives the testee the freedom to organize and express her thoughts and ideas in answering test questions. Test participants' answers are open, flexible and unstructured. The free description form is excellent for measuring learning outcomes of application level, analysis, evaluation and creativity.
- 2) Restricted Response Test. The limited description test is a form of description test that gives certain restrictions or guidelines to test participants in answering test questions. The limited test description should determine the desired answer limit. This type of item of limited free description should be used to measure learning outcomes of understanding, application and analysis.

### Higher Order Thinking Skills

Krathwohl & Anderson (2010) mentions Bloom developing his taxonomy into six categories of cognitive domains. Bloom's taxonomy categories are Knowledge, Comprehension, Application, Analysis, Synthesis, and Evaluation. All Unless Application categories each has subcategories. Bloom's taxonomy is not the only

formulation of the competency level, but it still seems to be the most popular and thorough coverage (Azwar, 2010, p. 63).

Brookhart in Kusuma et al, (2017, p. 26) states that higher-order thinking is considered the upper end of Bloom's taxonomy. "The ability to think" means learners can apply the knowledge and skills they develop during their learning to the new context. (Zohar et al, 2001) suggests that 45% of teachers believe high-level thinking is not suitable for underachieving students

Krathwohl & Anderson (2010) revised Bloom's taxonomy. Number of categories maintained six, but with important changes. Three categories are renamed, the second sequence is switched and the category names maintained are converted into verb forms to fit the way they are used in the goal. Taxonomic revisions can be seen in Table 1. Schraw in Zetriuslita et al (2016, p. 27) classifies thinking skills into two categories namely low-order thinking of knowledge, understanding and application. High-level thinking skills consists of analysis, synthesis and evaluation (Khoiriyah, Jalmo, & Abdurrahman, 2018).

The teacher gives examples of real-world problems, encouraging open class discussions, encouraging inquiry experiments, the potential for developing the consequences of critical thinking skills (Miri et al, 2007). Preparation of Higher Order Thinking using Problem Based Learning needs to consider educational goals and teachers should design problems to meet the stated goals (Weiss, 2003). Model of learning problem based learning and problem solving condition learners to develop thinking ability (Sucipto, 2017). Barnett & Francis (2012) conducted a study to test whether quizzes containing high-order thinking questions are related to critical thinking and performance tests when used simultaneously. The results show that critical thinking increases equally in all sections. The sections that receive the higher-order thinking quiz are done significantly better than the other two sections in the multiple choice and essay sections.

**Research Method**

**Participant**

Research using quantitative research techniques. The study used a sample of 135 learners at the junior high school level that were taken randomly in West Bandung District. Students are given 20 essay test items to work on. Test results are used to categorize learners' abilities.

**Instrument**

The instrument in this study is a set of essay tests consisting of grids, essay items, scoring guidelines, and assessment sheets.

**Procedure**

Researchers conducted in 2 stages of research that is small scale of 30 students and large scale of 105 students. students do essay to see the value of learning result. Learning outcomes is incorporated into categories using formulas. Researchers conducted data analysis based on learning outcomes and high-order thinking skills category.

**Result**

The results are divided into 2 parts, namely small scale and large scale. The results of the measurement of high-level thinking ability on a small scale using 30 samples were divided into 3 components. The results can be seen in Table 1 and Table 2. Table 1 presents the results of small-scale test and Table 2 presents the results of large-scale test.

Table 1. Small Scale Test Results

Skills	Percentage of students				
	Very High	High	Medium	Low	Very Low
Analysis	0	33	23	43	0
Evaluation	0	33	37	30	0
Create	0	33	23	43	0

Table 2. Large Scale Test Results

Skills	Percentage of students				
	Very High	High	Medium	Low	Very Low
Analysis	43	26	26	6	0
Evaluation	30	21	20	29	1
Create	29	28	41	3	0

**Discussion**

The researchers obtained data onto small-scale test results. Students do essay test of 20 items for 90 minutes. Table 1 shows the results of small-scale test of the ability of analysis, evaluation and creation of junior high school students none in the very high category. students are not in very high category because the time given is not proportional to the number of items. students get time to work 4.5 minutes per item.

Higher order thinking skill analysis is more common to low category sees in Figure 1. Students with low category analysis ability of 43%. However, students 'junior high school students' analytical skills are still offset by High's 33% and medium 23%. Ability analysis is the ability of high-level thinking that wants students to be able to describe a problem to know the elements and can determine the interrelationship between the elements. The findings of the study indicate that high-order thinking skills of junior high school students' level of analysis are still low. The junior high student has not been able to find the elements of a problem and determine the linkage.

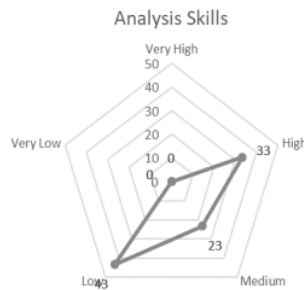


Figure 1. Analytical Skill of small scale test

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Higher order thinking skills is more dominant in the medium category see Figure 2. However, the ability of middle school students to evaluate can be called balanced with high, medium and low. Evaluation ability is the ability to consider based on criteria or standards. Students are asked to criticize or check. Junior high school students have a moderate ability to evaluate.

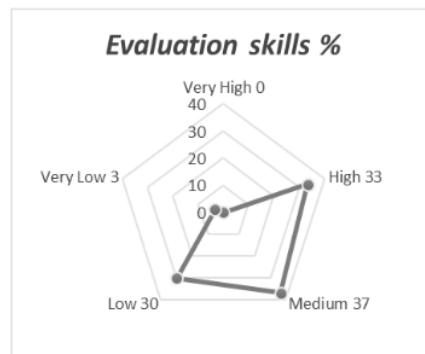


Figure 2. Evaluation Skills of small-scale test

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The ability to think in a high level of create level is similar to analytical skills see Figure 3. The dominant student in the Low category is 43%. The ability to create is the ability to combine several elements into unity. The junior high school students are still low in doing the create.

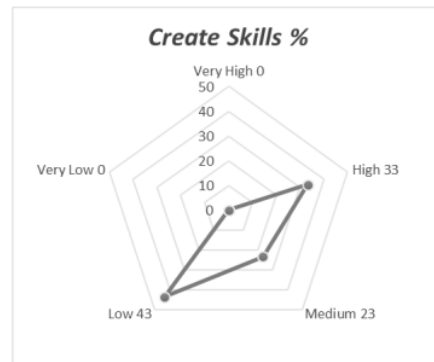


Figure 3. Create Skills small-scale test

The large-scale test using an assessment of 105 samples. The test uses 15 items that have been revised after a small-scale test. students get longer time of small scale test. students get 6 minutes per item. Large-scale test results are divided into 3 parts namely the ability of analysis, evaluation ability, and creativity.

Figure 4 shows the results of analysis analysis on a large scale scale. Found in Very High category. Students are not found in very low categories. However, found 6% of students in the low category. The category of students is very high increased from small-scale test, previously not found in very high category students. Improve your ability to get longer results. Question items allow analysis to be done, and students can understand the questions. Students can translate several elements into a single product or argument.

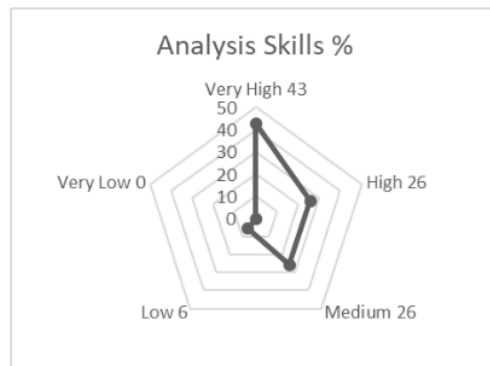


Figure 4. Analysis Large scale test skill

Students experience an increase and decrease to some categories. Students experience an increase in the category of very high compared to small-scale test. Evaluation ability decreases to high, medium and low category in figure 5. The decreasing ability is very significant in the very low category. The diminished item affects the ability of the evaluation. Students that have the intelligence can go in to answer questions well. However, students who are less clever then unable to conduct an evaluation.

### Evaluation Skill %

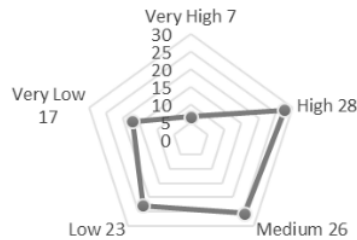


Figure 5. Evaluation Skill of large-scale test

Students in the measurement of high-order thinking ability have increased and decreased to some categories. Students experience an increase in the category of very high compared to small-scale test. The ability to create has increased significantly to the medium category. Students are able to answer questions on their language according to their ability to make an argument based on their knowledge.

### Create Skills %

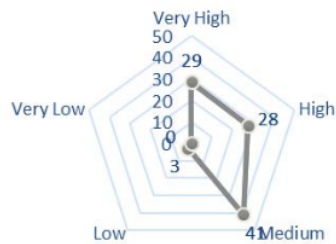


Figure 6. Create Large scale test skill

### CONCLUSIONS

Students have high-level thinking skills based on a revised taxonomy of bloom. High-level thinking skills consisted of analysis, evaluation and create. Small-scale tests show relatively similar abilities. Students do not seem too different because they get the ability to answer a short enough question. Analyze and create capabilities have the same percentage for each category. Large-scale tests show an increase in ability of each ability. But the discovery of students that are very low category of the need for attention by the teacher. Decreasing the category is very effective, teachers need to improve their ability and evaluation. Category Low and very low in the category of evaluation.

Teachers are encouraged to use learning models that train high-order thinking skills. Students can improve their analytical, evaluation and creational skills by being trained sustainably in learning. Students can better master the questions that measure high-order thinking skills. Students who have high-level thinking skills will be able to deal with problems with a complex and comprehensive. Prepare patterns of thought for higher education.

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