Performance Assessment of Arguing in the Guided Inquiry Learning

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ABSTRACT

The structure of claim argument disputes with the quality in which both are ideal. However that claim is not always associated with the structure arguments which is noble. Performance assessment is argued the skills assessment which argues that requiring students to have the skills to produce arguments. The object of research is to develop performance assessment instruments which argue on guided inquiry learning. Performance assessment instruments used to improve students' learning and understanding of the arguments. Performance assessment instruments developed by the scheme argue argumentation of Toulmin. This research using descriptive methods. The study population was high school students of class XI of Bandar Lampung. The Samples are using random cluster sampling technique for the fourth grade. The results showed that the production of the argument for the claim using the instrument performance assessment to argue in guided inquiry learning is 18.17%. This result represents that the production of quality argument is "weak" and the quality of the supported alternative claim and rebuttal backing tends not to be produced.

Keywords: Performance assessment, arguing Skills, Learning inquiry guided, Scheme argumentation Toulmin, descriptive method.

1. Introduction

The skill of science is defined by Duschl, Schweingruber, and Shouse (2007) as: 1) the ability to generate and evaluate scientific explanations and arguments and 2) the ability to participate in scientific practice (design and carry out investigations and argue) and connect steadily use the scientific norm. Both aspects of scientific capabilities have dissimilar ratings in each country, more assessment standards to emphasize on content, scientific practices, and cross-concept (NRC 2012). These extraordinary risk assessment standards for forcing teachers to change the learning according to the assessment standards, accordingly during the assessment of teachers focus on the content and practice of ignoring science oriented on arguing skills.

Scheming assessment practices argue prioritizing core activities of science and help students express knowledge in addition to the content. Assessment leads to movement science to explain and prove: 1) reveals scientific evidence and build a better argument (Cavagnetto, 2010); 2) participate actively in scientific practice and made a key component of argument (Berland & Reiser, 2008); 3) analyze and mengevalausi new claim knowledge (Ford, 2012); 4) the practice of science arrange further learning (Ford, 2008a, 2008b; Ford & Forman, 2006). Skills argue of key achievement in science, it is because 1) the scientific knowledge generated and evaluated to show students how to build scientific knowledge; 2) the involvement of scientific knowledge as an argument provides the basis for more multifarious and incorporated scientific explanation (McNeill & Krajcik, 2008; Sandoval & Millwood, 2005); 3) a desire to understand the science drive the process of coordination theory and evidence Kuhn (2010). Develop the assessment instrument performance to argue in guided inquiry learning using argumentation scheme Toulmin (1958) in order to form schema of analytical work to determine and check the argument. Toulmin argument scheme helps 1) allows to understand the argument more fully, truthfully, and commendably; 2) the process of collective cognitive development; 3) raising students' ability argumentation (Jiménez-Aleixandre, & Rodriguez, 2000; Kuhn et al, 1997); 4) increase scientific knowledge (Zohar & Nemet, 2002); 5) develop and analyze scientific statement, supporting the claim with evidence, and to explain and evaluate the reasoning that connect evidence for the claim (NRC, 2012); 6) apply scientific practice to the daily challenges and develop a way to convince others of the conclusions (Lawson, 2003); 7) a fundamental aspect of scientific literacy for all students to employ in argumentation higher (Driver, Newton, & Osborne, 2000); 8) a good way to help students develop the skills to argue (Christensona & Rundgren, 2014).

Toulmin argues components which construct an argument, consisting of: 1) claim: conclusion by considering the data; 2) Data: considering the evidence, information, facts, or procedures for the claim; 3) warrant: a description of how the data or evidence leading to the claim. Claim, data, and the warrant is the core argument that is labeled as the basic argument. 4) qualifiers: Special condition presents a degree of certainty claim; 5) backing: the underlying assumptions that provide justification in the warrant; and 6) rebuttal: claim that recognizes the boundary claim. Backing and rebuttal is a strong argument that is labeled as high argumentation.

The argument is constructed through physics of teaching with guided inquiry learning model promotes reasoning and understanding of scientific concepts. It is because, it classifies the relationship between the structure of the material by the production of argumentation. Guided inquiry learning determine the production levels of argument, as in learning constructing effective arguments that supported the statement convergent which generating more arguments. Involvement argument with guided inquiry learning helps to develop thinking skills to improve better argument. Based on the relationship between the

production of arguments to learning guided inquiry, then the argument can be developed properly through inquiry-guided. It is supported by Wilson, Taylor, Kowalski, and Carlson (2010), they say that argument is one of the skills required in the learning-based inquiry that promote argument. Learning to use the model of guided inquiry allows obtaining: reading phenomenon, compile research questions related to the hypothesis, test hypotheses, collect the data, analyze and interpret the data, draw conclusions, and express opinions / ideas (Katchevitch et al; 2011). Each stage is visualized in the activities of guided inquiry, and it is a performance that can be measured by performance assessment. Implementation of performance assessment requires an independent performance and encouraged to pay an attention to the quality of performance that can be used as a feed back into the process for the better. Based on the exposure, the purpose of research is to develop an instrument performance assessment scheme Toulmin argued, as an instrument that is used in advanced research.

2. Research methods

Instrument development performance assessment scheme Toulmin argument consists of a claim, data, warrant, qualifiers, backing and rebuttal. The quality argument is produced through analyzing the "claim" to write up the best thinking of the students in the form of claim with arguments in support of the alternative claim.

The study population was a high school student in the city of Bandar Lampung. Samples are numbered XI grade 4 classes. Data analysis using descriptive, based on the percentage arguing skills. Identification skills argumentation Toulmin argument based on the scheme through the relationship between the stages of guided inquiry learning model with arguing skills to expect.

Results of research performance assessment instrument development argue in guided inquiry learning is used to map the production of the student's argument. Summary results of the study are presented in Table 1:

Table 1. The average percentage of students argumentation production

The Structur of the Argument	Phase Guide Inquiry					Rata2
	Orientation	*Exploration*	*Concept formation*	*Application*	*Closure*	
Claim	4,75	1,67	2,67	4,33	4,75	18,17
Data	9,50	3,33	5,33	8,67	9,50	36,33
warrant	8,17	3,33	5,33	8,67	9,50	35,00
qualifiers	8,17	0,00	0,00	0,00	0,00	8,17
backing	0,00	0,00	0,00	0,00	0,00	0,00
rebuttal	0,00	0,00	0,00	0,00	0,00	0,00
Total	30,58	8,33	13,33	21,67	19,53	97,67

3. Discussion

Related Table 1, can be expressed descriptively related to the production of the student's argument, namely: the average production of the argument for the claim, data, warrant, qualifiers, backing, rebuttal respectively by 18.17%, 36.33%, 35.00% , 8.17%, 0.00 and 0.00%. Description of the production of the argument based on Table 1 is focused on components arguments are most commonly produced by the students to such claim.

Students are asked to analyze the statement "Candles floating in a glass filled with water and sink in a beaker containing alcohol" by writing the best statement of the ideas as the main claim. Analysis written by the students shows the arguments to support claim. Production of the arguments presented in Figure 1. The average percentage of production argumentation is 8.33% with 36.33% distribution data components to produce arguments; 35.00% warrant and qualifiers and claim 18.17%.

Based on Figure 1 can be described claim student A "because alcohol contains substances that cause all kinds of small objects will sink and the water is neutral, why can float candles? Due to the mass of wax is smaller than the density of water ". A student is able to produce a claim based only on observable facts and opinions that are not based on theory. Supposedly, the students A to start the study of factors objects can float or sink is a large density of liquid and solid, the nature of objects, shapes float and sinkers amount of substance. Study the problem comprehensively support the claim the quality of productivity. This is in line with the opinion of Marttunen & Laurinen (2001), their claims focused on the clarity of the claim, and the relevance of the adequacy of the argument (Bacig, Evans, Larmouth, and Risdon, 1990).

Based on the presentation, the students claim A not qualify clearly and understandable, less critical phenomena explained in the claim, less digging and captures data that implied a conflict in the matter, as a result of students A produced outside the context of expected claims from the initial claim. A student claims quite weak to the category with the capability of producing 5% argumentation.

Siswa A Siswa B Siswa C

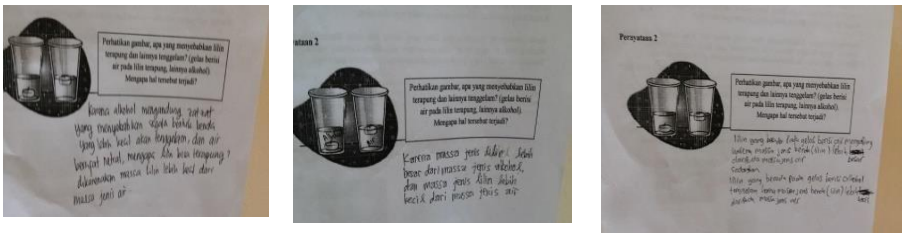

Figure 1: produce arguments claim, data, warrant dan qualifiers

Student B, and C produce a claim may be considered either in accordance with the structure should be targeted on the matter. Claim students B "because the density of the wax is greater than the density of alcohol, and the density of the wax is smaller than the density of water". The production quality arguments student B "weak" is only rated as "acceptable".

That claim student B is only able to load reasons but not relevant to the assessment which are discussed. On the other hand, students C is capable of producing qualifiers by writing the word "whereas" in the claim. Claim students C "candles are in a glass of water floats because the density of objects (candles) is greater than the density of water. While the candles are in a glass of alcohol is sinking because of the mass of the object (candle) is smaller than the density of water". Qualifiers produced by students C implies special conditions where the level of certainty claim aimed at narrowing the focus of the claim.

In general, the production of argumentation students B and C only 20% despite that the claim comprises components, data, warrants and qualifiers. This occurs because the student has not been able to produce an alternative claim for growing element of backing and rebuttal arguments. Production arguments include the claim that underlie critical argument rebuttal harmonized alternative productivity claim in terms of both quantity and logic. In general the results given by the students A, B, and C indicate that students appear to participate in the study and skilled in argumentative of logical thinking. However, they have not been able to implement their argumentative thinking spontaneously. Production of argumentation in this section ensures a more integrated assessment and generate positive feed back for the next lesson.

4. Discussion

The findings revealed that the production of the resulting argument is weak despite that the claim involves a data structure and qualifiers. The structure of claim arguing argue with the quality of both is ideal, but that claim is not always associated with the structure argue that good. The findings argues production quality assessment scheme Toulmin modifications in the category of "weak", It shows that the quality of students' alternative claim is not supported by a backing and rebuttal. However Osborne, Eduran, & Simon, 2004a recommend backing and rebuttal as a key element of skill which argued highest student. Make efforts to assess the quality of their arguments rubric enlarges a new dimension and provide guidance assessment rubric argue yet this has not helped to shift the emphasis in producing a quality argument.

However, research has shown how to familiarize students to 1) of thought and expression by providing claim structured to engage in the exploration of ideas, evidence and arguments brief and 2) know what we know, why it matters, and how it come. Habituation is more interesting for students, claim collaborative make students engage constructively. It becomes ideas to improve the quality of the student experience and the depth of student thinking and learning.

The results of the research to be the basis to revise the instruments used by taking into account factors that affect the production of the argument: 1) create a dissonance, to increase students' awareness on the concept of their own and provide an opportunity for them to experience dissonance (She, 2004; Posner et al, 1982) ; 2) The students' beliefs challenged

the concept of science (She, 2004; Vosniadou & Brewer, 1987); 3) provide mental structure that makes sense for students to reconstruct a more scientific concept (She, 2004); and 4) actively engage students in the process of conceptual change (Hewson & Hewson, 1983; She, 2004).

5. Conclusion

The trial results of assessment instruments using performance assessment is to argue on guided inquiry learning claim was 18.17%, 36.33% of the data, 35.00% warrant, qualfiers 8.17%, 0% and 0% backing rebuttal. Production Toulmin argued modification scheme in the category of quality "weak" and shows the quality of the supported alternative claim and rebuttal backing which tends not to be produced

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