

Does The Cognitive Activity Can Generate Student's Performance Argumentation Features?

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ABSTRACT

A performance-specific feature is a domain-specific to the organization of knowledge. Well-organized knowledge if students are able to collaborate utilizing the knowledge features of the physics problem. This is a reference for determining whether knowledge and process of accessing knowledge is dispersed or centralized. The knowledge feature can be a cognitive activity where teachers influence students by changing the pattern of knowledge from "defining" to "applying" knowledge. This research aims to analyse the cognitive organizing stimulus profiles of students formed from the performance of the argument. This research is a qualitative descriptive study with the population of high school students in the area of Bandar Lampung and samples of 100 students. Data collection techniques are done by observing and in-depth interviews using the instrument "the performance features of the students". The results showed that the students have successfully built knowledge and the process of accessing knowledge is centralized using the performance features with the concept of style. That is, students' involvement in cognitive activity by following a variety of procedures results in a systematic set of knowledge of the scientific phenomena of the problems presented. This indicates that the building of students' experience presents ideas as a situation that can be utilized to support the learning process.

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INTRODUCTION

Cognitive activity is naturally formed through a training process that occurs in the classroom environment. That is, students' cognitive activities must be supported by learning that develops an understanding of how data is used to build, evaluate, and revise knowledge. Some experts revealed

that: (1) maximizing the use of the classroom environment gives students opportunities to be involved in the scientific process (NRC, 2012). (2) efforts to incorporate scientific activities into learning activities in the classroom strengthen student knowledge (Schwarz *et al.*, 2017). (3) science learning means that learning

requires students to interact with each other in a new way (Guzey *et al.*, 2017; Johnson *et al.*, 2016; Osborne, 2010). and (4) the classroom environment becomes a learning environment that places students as science performers (Miller *et al.*, 2018). But in reality students have difficulty getting meaningfully involved in science learning due to the demand to be active in learning (Miller *et al.*, 2018; Murphy *et al.*, 2019; Sampson *et al.*, 2011). Ideally, experience of changing knowledge systems and the process of changing knowledge is the basis for the production of new knowledge in learning.

Science learning requires a variety of learning experiences. Teachers need to formulate cognitive activities that facilitate learning experiences where students practice science. Any research revealed that the power of learning centers on the dynamics of knowledge where students are positioned as agents producing learning experiences (Miller *et al.*, 2018). That is, the teacher plays a role in formulating the dynamics of knowledge to access the organization of student knowledge in the form of an argumentation performance feature. The dynamics of knowledge requires students to be involved in diverse learning and create performance arguments (condition the competition and ideas as a process of understanding concepts) (McNeill *et al.*, 2017; Stanford *et al.*, 2016). Performance argumentation plays an important role in how scientific knowledge is generated and revised in learning (Osborne, 2010). It was further revealed that developing student performance argumentation involved students (asking each other questions) to uncover and develop the concept of knowledge (Hsu *et al.*, 2019; Jiménez-Aleixandre & Eruran, 2008). This means that through performance features arguing the target of the learning process allows

students to acquire and generalize knowledge using the features set by the teacher. Any research revealed that the teacher has a role in determining how students interact during learning (Mortimer & Scott, 2003).

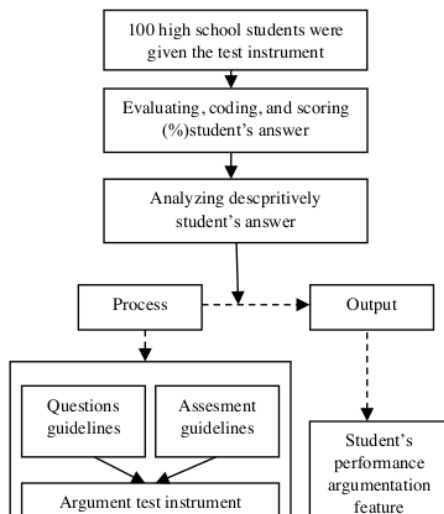
The performance feature argues that limits the type of contribution students can make during learning and helps teachers assess students' conceptual knowledge. The indicators of performance features argued in this study are: statement information models containing the characteristics of an understanding of concepts and network models of concept representation. With this feature, students have the opportunity to collaborate with friends to carry out the process of learning science. The performance features of arguing facilitate students construct new ideas and knowledge (Ford, 2012; Wingate, 2019). In line with the opinion that building and debating scientific understanding gives students the opportunity to interact with friends (Schwarz *et al.*, 2017). This means that the fulfillment of performance features argues as the implementation of science learning reforms (Viyanti *et al.*, 2016). Based on this, the purpose of this research is to analyze the cognitive organizing stimulus profile of the students formed from the performance of an argumentation feature.

The argumentation performance features in this study are outlined in the application of the assessment system by providing stimulus and continuous training. The choice of assessment system in analyzing the argumentation of performance features profiles is because the assessment acts as a feedback for the teacher to be able to improve the quality of the argumentation performance indicators leading to the achievement of the argumentation performance features.

METHODS

To find out the profile features of student performance arguments, the qualitative descriptive research method used in this study. The sample selection method uses purposive sampling involving 100 high school students in the Bandar Lampung city area. The data was collected using a research instrument in the form of a Style Concept material essay test with a total of 10 questions, which were constructed based on student performance argumentation indicators. The data that has been collected is scoring and calculating the average student who answers right and wrong. After the percentages are performed, the next stage is analyzed descriptively. Based on Viyanti (2019), the description of arguing performance features leads to the ability of students to: (1) work on understanding concepts, (2) consolidate concepts, (3) explore concepts, and (4) elaborate different statements of each problem as an effort to conceptual change. The whole process of this study can be summarized in figure 1.

Figure 1. The Stages of Analyzing Student's argumentation feature



RESULTS AND DISCUSSION

Teachers play a role in creating a classroom environment that supports student argumentation interactions (Evagorou & Dillon, 2011). As a result, it is important to analyze the way the teacher fosters a learning environment in which performance features argue to be one approach to stimulate students' cognitive organizing. The results of the analysis of the learning process that utilizes the performance features of the following argument are explained:

3.1 The statement information model contains the characteristics of an understanding of the concept

Figure 2 represents the statement information model that contains the characteristics of an understanding of the concept. Based on these problems, students are asked to pay attention to two toy cars that travel along the 2 m. Basically the teacher expects students to categorize concepts that must be produced by raising the problem of which car is faster. The problems proposed by the teacher can be solved well by students by submitting answer statements. The following are examples of answers from students 1 and students 2:

"Blue car, because the blue car goes first than the red car"

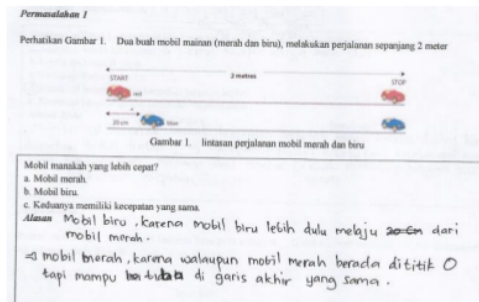


Figure 2. The example information statement model contains the characteristics of an understanding of the concept

"Red car, because even though the red car is at point 0 but is able to arrive at the same end line"

The answers represent students' ability to unite every element of the concept that has

certain similarities, even though the answers to student 2 are still not right. Based on this the students' ability to fulfill the process of scientific understanding enables students to produce their own investigative statements with stimulated curiosity and driven deep thinking to find the characteristics of the relationship between problems, clues, evidence/data, and conclusions. Student analysis can be presented sequentially (Creswell *et al.*, 2003). This means that students have been able to recognize several aspects of the concepts presented by the teacher. For example student statements:

"The blue car starts in front of the red car"

the statement is not a concept. Concepts arise when students are able to analyze further such statements:

"... because the red car starts at point 0 while the blue car has gone 20cm first"

Furthermore, students are said to be able to express a concept when able to explore and analyze the problem given in Figure 1 and then elaborate the concept in the form of an answer statement. This can be seen from the students' answers in Figure 2, namely the statement:

"... speed affects the distance that will be traveled ..."

To be able to state the answer, ⁷ students must be able to explore and analyze problems and possible answers. In addition, each student statement clue can be

combined to form a different concept, for example:

"... the faster the vehicle's speed the closer it is; the further the distance the shorter the time required".

Related to this, the concept is represented by a set of elements or a collection of information that is verified based on relevant theory (consolidation). The ability of students to find statements is an indication of students' steps towards understanding. On the other hand the statements produced by students make a good source of information for teachers package feed back. It is very important to encourage students to produce statements and reflect on the process of arguing performance (Simon *et al.*, 2006).

3.2 Network Model Representation Concept

Figure 3 represents the organization of knowledge through concept network relations. The concept relationships produced by students are indicated by statements

"The forces acting on the book are the gravity force, and the normal force, the gravity force"

this is reinforced by students' additional information:

"... because there is a style of action and reaction between books and tables, the book has a weight down and the table gives an upward push so that the book remains silent".

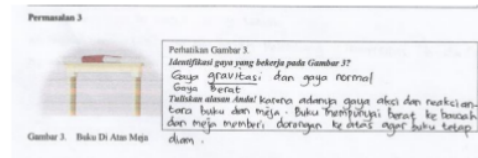


Figure 3. Examples of network representation features produced by students

The conceptual relationship networks that succeed in producing students explicitly provide information that the whole process requires basic concepts to test the ideas displayed in order to assess the accuracy of the concepts presented by students. This process allows students to begin to develop the basic concepts of a theory (Marshall & Rossman, 2015). This is as an implication that the organization of concepts presented by students is composed of basic concepts that are related and interconnected. The way the teacher frames the performance features of the argumentation has an impact on how students understand and are involved in understanding a basic concept and that modeling expectations around the use of data encourages students to produce quality statements (Berland & Hammer, 2015; González-Howard *et al.*, 2017). That is, this feature provides students the opportunity to provide a stepping stone for further concepts. Is important to consider how the performance argumentation features are framed to produce new student learning interactions (Miller *et al.*, 2018). Student involvement in organizing knowledge through concept network relationships inherently requires changes in the way of producing statements by students (González-Howard *et al.*, 2017). This means that this step helps the teacher analyze how statements can be coordinated (O'Conner & Michaels, 1993). In addition, teachers need to facilitate students involved in the process of confirming and deciding data to test a concept (Locke *et al.*, 2013).

CONCLUSION AND SUGGESTION

The results showed the students have succeeded in building knowledge and the process of accessing knowledge is centralized using performance features arguing the concept of style. This shows that, the involvement of students in cognitive activities by following various procedures produces a systematic collection of knowledge about the scientific phenomena of the problems presented. It's important to the future study to assess how student's interaction can contribute to student's performance argumentation.

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