Inquiry-Based Learning Model with Small Steps Technique in Using Google Drive Media in Learning of Chemistry

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Abstract

The aim of the research is to find out Inquiry-Based Learning by Small Steps technique in chemistry subject through online learning of Google drive media for the students of 10th grade in Audio-Video Engineering (10th AVE) skill competency in the Academic Year 2016/2017 in 1st PIRI Vocational High School, Yogyakarta. This study included learning activities and achievement in studying chemistry. Subjects of the study were students of 1st PIRI Vocational High School Yogyakarta at 10th grade in Audio Video Engineering (10th AVE) skill program in the academic year 2016/2017. There were 15 students comprising 14 boys and 1 girl. The steps in Inquiry-Based Learning are presenting problems, formulating problems, arranging hypotheses, collecting data, testing the hypotheses, and concluding. The data collection used observation sheets, test and questionnaire. Data obtained were analyzed descriptively. Based on the results it was found that: (1) Use of Google drive media can increase students effectiveness in chemistry learning particularly at the atomic structure matter to be very pleasant. This is evident from the score of students activity data of 4 (good), the score of students positive response data of 85% (Very Positive) and the data of precycle student learning outcomes: 41%, Cycle 1=54% and Cycle 2= 85%.

Keywords: Inquiry Learning, Google Drive Media, Learning Media

Introduction

In learning chemistry, understanding of essential concepts is essential. Good understanding of the essential concepts will allow the learners to place these concepts in long term memory systems and can use them to higher level thinking such as problem solving and creative thinking. Good understanding of the essential concepts should facilitate them in achieving the minimum completeness criteria (MCC) established by the school.

The current reality in the 10th grade of AVE in 1st PIRI VHS Yogyakarta is still far from ideal conditions. Understanding of the essential concepts in chemistry subject in everyday life is still low (grade average of 65). In addition, the number

of learners who achieve and exceed the MCC is less than 60%. The MCC for chemistry subjects in the Academic Year 2016/2017 is 75. Some of the possible causes of low understanding of learners on the Atomic Structure which is result in the low grade average score and classical completeness that is not achieved are: (1) Atomic Structure contains many concepts of chemistry with terms that are hard to remember and understand; (2) the learning strategy used is still not sufficient to facilitate the acquisition of understanding for learners.

In general, the problems faced in the chemistry learning process is not much different from other adaptive learning. However, the peculiarities of chemistry that learn about the natural phenomenon that can not to be seen caused the message presentation of the chemistry science is not easy. Based on the above mentioned reasoning it is necessary for the application of an inquiry-based learning model with *small steps* techniques in Atomic Structures material for 10th AVE in 1st PIRI VHS Yogyakarta. This is important as a collective effort in improving the quality of Chemistry learning which leads to the improvement of students' learning achievement in Chemistry subjects.

Based on the above mentioned background, the problems to be discussed in this research are:

1. How is the model of Inquiry-Based Learning Model with Small Steps Technique can motivate the learners of the 10th grade AVE in 1st PIRI VHS Yogyakarta?
2. How is the implementation of Inquiry-Based Learning Model with Small Steps Technique can improve the learning achievement of learners of the 10th grade AVE in 1st PIRI VHS Yogyakarta?

As for the purpose of this research, among others:

1. To describe Inquiry-Based Learning Model with Small Steps Technique can motivate to study the learners of the 10th grade AVE in 1st PIRI VHS Yogyakarta on Atomic Structure Material.
2. To find out the activity of Inquiry-Based Learning Model with Small Steps Technique can improve learners' achievement of Chemistry at 10th grade AVE in 1st PIRI VHS Yogyakarta on Atomic Structure Material.

The benefits of the research are: can improve the quality of chemistry learning process and chemistry learning outcomes on the Atomic Structure material and can improve the skill/psychomotor. It can improve teacher creativity. It improves teacher skill in preparing the concept of learning. And it can improve the insight and profession of teacher in the learning process. It can provides a broader picture that in the real world of education there are problems associated with teaching and learning process and it allows to know much more application of inquiry-based learning that can be used to solve problems in the classroom.

Material and Methods

This is a type of an inquiry research. Inquiry-based learning is a strategy of exploring learners' knowledge. There are four important stages in the implementation of the inquiry-based learning that are arranging hypotheses, collecting data, interpreting evidence and drawing conclusions (Banks, James A. 1985)

Small Steps technique is a technique of learning by providing a sheet of practice questions from the easiest to the most difficult starting point. By providing the question from the easiest it is expected that the learners will be confident and will try to dig deeper knowledge by completing the higher level of question. Kumon defined self-learning ability as the ability to set goals and solve difficult tasks independently. Google Drive is a file sharing service owned by Google. By creating a Gmail account it allows users to access the Google Drive features. Google Drive has several functions, one of them is a storage to back up data, and shares files that have been uploaded before. Making an online test or exam questions with Google Drive is fairly simple and very easy.

In learning activities, motivation can be said as the overall driving force within the learners that leads to learning activities and that provides direction in the learning activities, so that the desired goal of learning subjects can be achieved (Sardiman, 2000). Learning motivation is a non-intellectual psychological factor. It distinctive role is in terms of growing passion, feeling happy and eager to learn (Djamarah, 2006). The learning motivation is very important and an absolute requirement for learning. In schools it is often that learners are lazy to learn, tend

to absent and so forth. In this case the teacher is said to not succeed in providing the right motivation to encourage students to work with all their knowledge and ability. In this context a bad score on a particular subject does not mean that the student is foolish about the subject. Thus, in the learning process, motivation is necessary because someone who has no motivation in learning, will not be possible to do learning activities (Djamarah, 2006).

The variables that would be sought through this research were: Inquiry-Based Learning Model with Small Steps Technique with cognitive approach and chemical learning achievement. The research was conducted in 1st PIRI VHS Yogyakarta at 10th grade AVE in academic year 2016/2017. Indicator of success, if there was an improvement achievement of absorbing capacity change equal to 75% of learners absorbing capacity. (Corresponding to MCC of Chemistry subjects to Class X is 75).

Fig. 1. Stages of Using Google Drive Module

Qualitative data collection techniques, namely *Enquiring* that is the data collection techniques through questions by researchers. Data collection techniques can be interviews, questionnaires, attitude scales, or tests (Arikunto, Suharsimi, et al., 2006).

Table 1. Success Level of Learning Aspects

Percentage range	Success level
85% - 100%	Very good
75% -< 85%	Good
50% -< 75%	Pretty good
0 -< 50%	Not good

Source: (Daryanto, 2011)

Results and Discussion

The results of this research were based on the results of observation and evaluation of the students ability test in understanding the atomic structures and

atomic components materials through inquiry-based learning. This can be determined from the results obtained by the learners in each cycle start at the initial test, cycle I and cycle II.

The ability to understand the material of atomic structure in the initial test, the learners achieved an average score of 41%. Based on the results obtained it indicated that the ability to analyze the intrinsic elements to understand the atomic structure material through the inquiry-based learning in the initial test can be categorized as less. In cycle I the learners reached an average score of 54% is categorized to be enough. Based on the results obtained it is determined that the learners already improved. The learning and teaching process took place well. However, there was still a problem arise in the cycle I that is the students were hesitant to ask questions to the researcher although he gave opportunity to the learners to ask. This happens because the learners were not careful and appropriate in analyzing the intrinsic element of understanding the matter of atomic structure through the inquiry-based learning. Thus the researcher needs to continue learning to the cycle II.

Fig. 2. The Small Steps Technique Learning

In cycle II the learners reached the average score of 85% which is categorized to be Good. Based on the results obtained it is found that the learners have increased score in understanding the material of the composer of atom through the inquiry-based learning. The increase in value in cycle II is caused due to the learners are no doubt to ask the researcher about the things that are not understood. Based on the above mentioned, the researcher decided to continue the research to cycle II. As for the result of improvement of study is in analyzing and understanding the materials of atomic structures and constituents.

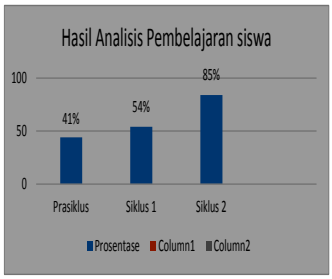

Fig 2. The Results of Student Learning Analysis

Fig 2. above shows that students' learning outcomes in analyzing atomic structure materials in inquiry-based learning are increasing, from the initial test 41%, Cycle 1 is 54% and Cycle 2 is 85%.

Conclusion

Based on the results it was found that: (1) Use of Google drive media can increase students effectiveness in chemistry learning particularly at the atomic structure matter to be very pleasant. This is evident from the score of students activity data of 4 (good), the score of students positive response data of 85% (Very Positive) and the data of precycle student learning outcomes: 41%, Cycle 1=54% and Cycle 2= 85%.

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