Stimulant Question To Help Student's Associating Skill In Making A Conclusion

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Abstract

Indonesia's curriculum use scientific approach and teachers have some problems to use scientific approach in 5M especially in associating (make a conclusion). The purpose of this research is to make lesson plan that teach how to make a conclusion with stimulant questions to students and can help the associating skill of student with stimulant questions. Respondents are 27 students 8th grade in Tuntang. The method is research action class with teacher be research. This research use 5 models of lesson plan in associating (make a conclusion), observation sheets, cognitive sheets, and quetionnaire sheets. The data processed in descriptive qualitative. The result showed average 88,14% students can make a conclusion with stimulant questions. This is supported with questioner showed average 88,14% students was helped with stimulant questions. Test result showed average 86,48% students can make a conclusion with stimulant questions. Because of that, stimulant questions can help the student's associating skill in making a conclusion.

Keywords*: associating, make a conclusion, stimulant questions*

1. Introduction

Curriculum is the core of education[1]. All of the curriculum since KBK (*Kurikulum Berbasis Kompetensi*), KTSP (*Kurikulum Tingkat Satuan Pendidikan*) until K13 (*Kurikulum 2013*) used scientific approach where the methods are believed for the behaviour development, creativity, and knowledge of the students[2]. The steps used on KTSP called EEK (exploration, elaboration, and confirmation), therefore in K-13 called 5M (observing, questioning, experimenting, associating, communicating).

Based on the observation in several schools, many teachers were confused about the 5M steps since they could not implement it[3]. Teachers at SMP Tuntang also have difficulties in implementing the 5M steps. Consequently, the teaching and learning activities with the use of K-13 cannot flow smoothly. Therefore, mastering science skills are needed to implement the 5M steps, such as observing and found out the problems, asking, planning an experiment, observing the experiment, concluding and communicating the findings.

There are two reasons to implement the process on teaching and learning activity. First, students should be able to interpret data or conjugate data from tables, graphs or diagrams [4]. Second, asking questions are good to stimulate students' respond [5].

The purpose of the study is to produce lesson plans to help students concluding stimulant questions given by the teacher. It is expected that this study can help teachers to teach students in concluding stimulant questions. The benefit of the study is to to produce lesson plans to help students concluding stimulant questions given by the teacher and this study can help teachers to teach students in concluding stimulant questions so this study can apply in several school.

2. The Study

This research is an action research (*PTK*), where teacher as researcher. This research is a descriptive investigation and the data were analyzed using qualitative method. The data procedures are explained below:

a. Planning

The instruments on this study are five lesson plans on concluding, observation sheets, cognitive test, and questionnaire. The cognitive test sheets consist of list of question about concluding stimulant questions.

b. Implementation

The data collected through schools' extracurricular based on the lesson plans that already been prepared before. During the extracurricular, the researcher completing the observation sheet. After finished on teaching, the cognitive sheets are distribute to the students and at the end of the extracurricular the researchers give out questionnaire sheets to be answered by students.

c. Reflections

The data collected from observation sheets, questionnaire sheets, and cognitive test sheets used to determine whether the extracurricular used are effective or not. The precentage of the data shows :

- Observation sheets : > 70% students are concluding correctly
- Questionnaire sheets : > 70% of the concluding questions help students
- Cognitive test sheets: > 70% the average grade that students got is 70.

This research will be determine as a success if the observation sheets, questionnaire sheets and cognitive test sheets meet the criteria of each categories. The researchers should stop investigation if the criteria of each categories reached. However, if the investigation have not meet the criteria yet, then the researcher should investigate continously until they reached the categories. An unclear stimulant questions can be the obstacle of the investigation. Thus, the researchers should revised the question until it can increase students' understanding on concluding the stimulant questions.

d. Data Analysis

The data from observation sheets and questionnaires will be analyzed descriptive-qualitative.

- Analyzing observation sheets

At least 70% students could answer every questions about concluding stimulant questions, so that students will answer it correctly.

$$P = \frac{f}{N} X\ 100\%$$

where :

P = the precentage of all students who can answer and conclude stimulant questions.

f = all students who can answer and conclude stimulant questions

N = total amount of students

If there were <70% students who can answer the stimulant questions and concluding the questions as the researchers asked, then the use of stimulant questions have not succeed yet. Therefore, the researcher should conduct follow up research.

- Analyzing questionnaire sheets

  The questionnaire sheets were succeed if : 70% in minimal students answer the questions correctly and they feel that by answering those questions are helpful for them to conclude stimulant questions.

$$P = \frac{f}{N} X\ 100\%$$

where :

P = the precentage of all students who can answer and conclude stimulant questions.

f = all students who can answer and conclude stimulant questions

N = total amount of students

If there are <70% students felt helpful with this method then the stimulant questions have not succeed. Therefore, the researcher should conduct follow up research to fulfill their needs.

- Analyzing cognitive test sheets

  70% students got >70 (passing grades) on the last material given. The grading criteria on this cognitive test sheets are measured by the answer of the students. The formula to count students' passing grade is listed below :

$$P = \frac{f}{N} X\ 100\%$$

where :

P = the precentage of all students who can answer and conclude stimulant questions.

f = all students who can answer and conclude stimulant questions

N = total amount of students

e. Participants

The participants on this study were 27 eight grader students at junior highschools (Tuntang)

3. Result and Discussions

The researchers on this study used five lesson plans with the material that have been taught before, which are magnetic, work, pressure on solid, uniform

rectilinier motion, and pressure on gas. Those five materials represent the eight grader learning material.

3.1 Magnetic

The purpose of this material that students could show different energy of a magnet. The students did an experiment using iron powder, nail, string balance and staple. All those materials are arranged on a magnet. Students were given stimulant questions, so that they could conclude the result of the experiment.

a. Iron Powder

Students were given stimulant questions to conclude the result of the experiment. The first question was *"What does it mean if the iron powder clinged a lot to the magnet?"* About 88,88% students answered that the energy of the magnet is strong. The second question was *"What does it mean if the iron powder did not stick on the magnet?"* About 88,88% students answered that the energy of the magnet is not strong enough. The third question was *"Where is the strongest part of the magnet?"* About 88,88% students answered that the strongest part of the magnet is on the tip of the magnet. The fourth question was *"Where is the weakest part of the magnet?"* About 88,88% students answered that the weakest part of the magnet is on the middle of the magnet. About 88,88% students could conclude that the energy of a magnet is different on every part. The strongest part of a magnet is on the tip of a magnet and the weakest part of a magnet is on the middle of a magnet.

b. Nail

Students were given stimulant question to conclude the result of an experiment of a magnet and nails. The first question was *"What does it mean if there are lot of nails that stick on the magnet?"* About 88,88% students answered that the energy of the magnet is strong. The second question was *"What does it mean if nails did not stick to the magnet?"* About 88,88% students answered that the energy of the magnet is not strong enough. The third question was *"Where is the strongest part of the magnet?"* About 88,88% students answered that the strongest part of the magnet is on the tip of the magnet. The fourth question was *"Where is the weakest part of the magnet?"* About 88,88% students answered that the weakest part of the magnet is on the middle of the magnet. About 88,88% students could conclude that the energy of a magnet is different on every part. The strongest part of a magnet is on the tip of a magnet and the weakest part of a magnet is on the middle of a magnet

c. Spring Balance

Students were given stimulant questions to conclude the result of an experiment of a magnet and a spring balance. The first question was *"What does it mean if the energy on spring a balance*

is strong?" About 88,88% students answered that the energy of the magnet is strong. The second question was *"What does it mean if the energy on a spring balane is weak?"* About 88,88% students answered that the energy of the magnet is not strong enough. The third question was *"Where is the strongest part of the magnet?"* About 88,88% students answered that the strongest part of the magnet is on the tip of the magnet. The fourth question was *"Where is the weakest part of the magnet?"* About 88,88% students answered that the weakest part of the magnet is on the middle of the magnet. About 88,88% students could conclude that the energy of a magnet is different on every part. The strongest part of a magnet is on the tip of a magnet and the weakest part of a magnet is on the middle of a magnet.

d. Staples

Students were given stimulant question to conclude the result of an experiment of a magnet and staples. The first question was *"What does it mean if there are lot of staples that stick on the magnet?"* About 88,88% students answered that the energy of the magnet is strong. The second question was *"What does it mean if the staples did not stick to the magnet?"* About 88,88% students answered that the energy of the magnet is not strong enough. The third question was *"Where is the strongest part of the magnet?"* About 88,88% students answered that the strongest part of the magnet is on the tip of the magnet. The fourth question was *"Where is the weakest part of the magnet?"* About 88,88% students answered that the weakest part of the magnet is on the middle of the magnet. About 88,88% students could conclude that the energy of a magnet is different on every part. The strongest part of a magnet is on the tip of a magnet and the weakest part of a magnet is on the middle of a magnet

Based on the observation above, it shows that the stimulant questions are understandable and about 88,88% students could conclude the result of this experiments. From the cognitive test sheets, it shows that about 96,29% students felt that this experiments help them to conclude that every part of a magnet has different energy. This cognitive tests result is supported by the result of questionnaires that 88,88% students are already understand with the questions given, and it helps them to know the energy of a magnet in every part. From these results, more than 70% students could draw conclusions correctly. Therefore, the researcher on this study did not need to conduct second research.

3.2 Work

The purpose of this material that students could explain the relations between tilt angle, needed force and the track length to elevate things in certain altitude. Students did an experiment about a train that pulled with a spring balance on certain tilt where the tilt is various. Students were given stimulant questions, so they could conclude the result

of the experiment. The first question was *"If the inclination of the field is bigger (θ), how big a force (F) is required to lift an object to some altitude (h)?"* About 88,88% students answered that the larger the inclination of the slope, the bigger force required. The second question was *"If the inclination of the field is bigger, how track length (s) needed to lift an object to altitude (h)?"* About 88,88% students answered that the bigger the inclination, the shorter track length (s) to lift an object to altitude (h). In conclusion, the third question was *"If the inclination of the field is bigger (θ), how big a force (F) is required and how track length (s) needed to lift anobject to altitude (h)?"* About 88,88% students answered that the bigger the inclination, the bigger force needed and the shorter the track length (s) needed to lift an object to altitude (h). About 88,88% students conclude that the bigger the inclination (θ), the bigger force (F) needed and the shorter the track length (s) needed to lift an object to altitude (h).

Based on the observation above, the stimulant questions are understandable and about 88,88% students could conclude the result of this experiments. From the cognitive test sheets, it shows that about 92,40% students felt that this experiments help them to conclude and explain the relations between tilt angle/inclination (θ), needed force (F) and the track length (s) to elevate things in certain altitude (h). This cognitive tests result is supported by the result of questionnaires that 88,88% students are already understand with the questions given, and it helps them to conclude and explain the relations between tilt angle/inclination (θ), needed force (F) and the track length (s) to elevate things in certain altitude (h). From these results, more than 70% students could draw conclusions correctly. Therefore, the researcher on this study did not need to conduct second research

3.3 Pressure On Solids

The purpose of this material that students could explain the factors that affect the magnitude of solid pressure. Students did an experiment about a block that placed above butter. The block added with some loads to know the relation about pressure and force. Then, the block changed the area of its cross section to determine the relation between pressure and cross-sectional area, and students observe the butter. Students were given stimulant questions so they could conclude the result of the experiment. The first questions was *"What does the depth of butter"* About 96,29% students answered pressure. The second question was *"If the force (F) gets bigger, how big is the pressure?"* About 96,29% students answered that the bigger the forces, the bigger the pressure. The third question was "*How about the relation between P and F?"* About 96,29% students answered P is comparable to F. The fourth question was *"How to write that relation into mathematical form?"* About 96,26% students answered P ~ F. The fifth questions was *"If the cross-sectional area (A) is bigger, how big is the pressure (P)?"* About 95,29% students answered the bigge the cross-sectional area, the bigger the pressure. The sixth question was *"How about the relation between P and A?"* About 96,29% students answered that P

inversey to A. The next question was *"How to write the relation in mathematical form?"* About 96,29% students answered P ~ $\frac{1}{A}$. The eight question was *"If the force (F) of cross-sectional area (A) is bigger, how big is the pressure (P)?"* About 96,29% students answered the bigger the force, the bigger the pressure and the bigger the cross-sectional area, so the pressure will be smaller. The next question was *"How are the the relation between P, F and A?"* About 96,29% students answered P is comparable to F and P inversely to A. The last question was *"How to write those relation in mathematical form?"* About 96,29% students answered P = $\frac{F}{A}$. About 96,29% students conclude that the factors which affect pressures are forces and cross-sectional area, more pricisely that pressure is comparable to force and force incersely to cross-sectional area.

Based on the observation, it shows that the stimulant questions are understandable and about 96,29% students could conclude the result of this experiments. From the cognitive test sheets, it shows that about 81,94% students felt that this experiment help them to conclude and explain about the factors that affect pressures. This cognitive tests result is supported by the result of questionnaires that 96,29% students are already understand with the questions given, and it helps them to conclude and explain the factors that affect pressures. From the result above, more than 70% students conclude correctly. Therefore, the researcher on this study did not need to conduct second research

3.4 Uniform Rectilinear Motion

The first purpose of this material that students could investigate the characterictics of GLB (*Gerak Lurus Beraturan/Uniform Rectilinear Motion).* Students did an experiment with trains which connected with a ticker timer, and students observe the dots on the ticker timer tape. Students were given stimulant questions so they could conclude the result of the experiment. The first question was *"How is the track?"* About 85,18% students answered straight. The second question was *"How is the dots track length?"* About 85,18% students answered similar. The third question was *"How about the track length time? Is it slower or faster?"* About 85,18% students answered similar. The fourth question was *"How fast it is? Is it slower or faster?"* About 85,18% students answered similar. About 85,18% students conclude that the characteristic of GLB is the track should straight and the speed should same.

The second purpose of this material that students could explain the relation between length, speed and time in GLB. Students did an experiment with trains which distance,speed, and time are changed repeteadly. Students were given stimulant questions to conclude the result of the experiment. The first question was *"If two objects move at the same time, if the speed (v) faster, how long the track length (s) is?"* About 85,18% students answered the faster it is, the long the track length (s). The second question was *"What is the relation between s and v?"* About 85,18% students answered s is comparable to v. The third question was

"How to write the relation into mathematical form?" About 85,18% students answered s ~ v. The fourth question was *"If two objects use the same speed, if the track length (s) is longer, how long the time (t) is needed?"* About 85,18% students answered the longer the track length (s), the longer it takes to certain range. The fifth question was *"What is the relation between t and s?"* About 85,18% students answered t is comparable to s. The sixth question was *"How to write the relation into mathematical form?"* About 85,18% students answered s ~ t. The seventh question was *"If two objects use the same track length (s), if the speed (v) faster, how long the time (t) is needed?"* About 85,18% students answered the faster it is, it does not take more time to reach a certain distance. The eight question was *"What is the relation between t and v?"* About 85,18% students answered t inversely to v. The last question was *"How to write the relation into mathematical form?"* About 85,18% students answered t ~ $\frac{1}{v}$. About 85,18% students conclude the relation between track length (s), speed (v), and time (t).

Based on the observation above, the stimulant questions are understandable and about 85,18% students could conclude the result of this experiment. From cognitive test sheets, it shows that about 74,93% students felt that this experiment help them to conclude and explain about the characteristic of GLB related to track length (s), speed (v), and time (t). Those cognitive test result is supported by the result of questionnaires that 85,18% students are understand with the questions given and it helps them to conclude and explain the characteristic of GLB. From the result above, more than 70% students conclude correctly. Therefore, the researcher on this study did not need to conduct second research

3.5 Pressure On Gas

The purpose of this material that students could explain pressure of a gas substance in the enclosed space and in the open space. Students were given stimulant questions so they could conclude the result of the observation about pressure of gas substance in the enclosed space and in the open space.

a. In the enclosed space

Students did an experiment with closed erlenmayer tubes which heated. Students were given stimulant questions to conclude the result of the experiment. The first question was *"What happens to airflow if there are two different chambers of air pressure?"* About 81,48% students answered the air will flow from high pressure to low pressure. The second question was *"in the open space, which chambers with bigger airflow?"* About 81,48% students answered inside the erlenmayer tubes. The third question was *"How is the air pressure?"* About 81,48% students answered the air flows from inside to outside of the erlenmayer tubes. The fourth question was *"If the erlenmayer tubes made from glass, does the air could gride the glass?"* About 81,48% students answered no. The fifth question was *"Which part of the erlenmayer tube is passable for air?"* About

81,48% students answered erlenmayer tube cover. The sixth questions was *"What causes the erlenmayer tube cap thrown up?"* About 81,48% students answered the air inside the erlenmayer tube. The seventh question was *"If the erlenmayer tube cover thrown up, how about the air pressure inside the tube?"* About 81,48% students answered the air pressure inside the tube is higher. The next question was *"If it is so, the air pressure inside the tube enlarges or shrinks?"* About 81,48% students answered the air pressure enlarges. About 81,48% students could conclude the air pressure heated in the enclosed space.

b. In the open space

Students did an experiment using a box that had two chimneys, where one of the chimneys was given a candle. Students were given stimulant question to conclude the result of the experiment. The first question was *"In the open space, how is the airflow in the box?"* About 81,48% students answered the air flows from chimney B to chimney A. The second question was *"if the air over the fire moves, how about the distance between the air particles? Is it tenuous or tight?"* About 81,48% students answered tenuous. The third question was *"If the air particles tenuous, the air pressures high or low?"* About 81,48% students answered low. The fourth question was *"Basically, the airflow flows from where to where?"* About 81,48% students answered from high air pressure to low air pressure. The fifth question was *"Which part on the box that has high air pressure?"* About 81,48% students answered chimney A. The last question was *"When itis heated, the air pressure in the open space increases or decreases?"* About 81,48% students answered the air pressure decreased. About 81,48% students conclude that the air pressure in the open space decreased when it is heated.

Based on the observation above, it shows that the stimulant questions are understandable and 81,48% students could conclude the result of this experiments. From the cognitive test sheets, it shows that about 86,85% students felt that this experiment help them to conclude and explain about the factors that affect pressures. This cognitive tests result is supported by the result of questionnaires that 81,48% students are already understand with the questions given, and it helps them to conclude and explain the factors that affect pressures. From the result above, more than 70% students conclude correctly. Therefore, the researcher on this study did not need to conduct second research

4. Conclusion

From result and discussions show that more than 70% students conclude the result correctly. The result showed average 88,14% students can make a conclusion with stimulant questions. This is supported with questioner showed average 88,14% students was help with stimulant questions. Test result showed average 86,48% students can make a conclusion with stimulant questions.

Because of that, stimulant questions can help the student's associating skill in making a conclusion. Therefore, the suggestion for this study is this study can apply in several school, continuing the next research and observing with another learning materials.

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