The Implementation of NHT and GQGA Learning Model to Enhance Student's Liveliness and Cognitive Learning Outcomes.

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Abstract:

The objectives of the research are: (1) to identify whether the use of Numbered Heads Together (NHT) and Giving Question Getting Answer (GQGA) can improve the students' activeness in peripheral reparation at X TKJ SMK Muhammadiyah 2 Ngawi in the school year of 2015/2016; (2) to identify whether the use of Numbered Heads Together (NHT) and Giving Question Getting Answer (GQGA) can improve the students' cognitive learning outcomes at X TKJ SMK Muhammadiyah 2 Ngawi in the school year of 2015/2016. This research was classroom action research which conducted in two cycles. Each cycle consisted of planning, action, observation, and reflection from March until April 2016. The subject of research was the X TKJ grade of SMK Muhammadiyah 2 Ngawi in the school year of 2015/2016. The research data were collected by using techniques of interview, observation, tests (pre-test and post-test), documentation. The qualitative data were validated by using triangulations, and then the quantitative data were validated by using content validity. The qualitative data were analysed by using reduction, presentation, verification, conclusion, and then the quantitative data were analysed by using descriptive statistics. The results showed that the implementation of collaboration NHT and GQGA improved the activeness and cognitive learning outcomes. The percentage of activeness before the implementation of collaboration NHT and GQGA was 19,44%, after that 61,54% in cycle I, and 69,23% in cycle II. The cognitive learning outcomes also increased. The percentage of the qualified students was 38,46%, after that 51,28% in cycle I, and 71,79% in cycle II. From the results above, it can be concluded that the implementation of collaboration NHT and GQGA can improve the activeness and learning outcomes in peripheral reparation at X TKJ students of SMK Muhammadiyah 2 Ngawi in the school year of 2015/2016.

Keywords: Numbered Head Together, Giving Question Getting Answer, Activeness Cognitive Learning Outcomes

Introduction

Learning is a process of interaction between teachers who acted as executor of teaching activities with students who act as executor of learning activities. Learning that takes place at each school is different. The quality of learning can be seen from the learning process and student learning outcomes. The learning process will be better if done actively by teachers and students, but generally only done in active learning by teachers. It is not much different from the learning that takes place in SMK Muhammadiyah 2 Ngawi where learning is dominated by teachers.

Based on an interview on one of the subject teachers of computer network engineering program SMK Muhammadiyah 2 Ngawi, low student activity caused by the lack of response of students to the material presented, so that students tend to be passive and only teachers who play an active role in learning. Based on classroom observation has been done in class X TKJ SMK Muhammadiyah 2 Ngawi, it is known that there are many learning activities of the student in the learning that takes place. The results of classroom observations conducted during the study showed that there are five active student learning, which is dominated by male students. The percentage of active students is 13.16%, while the percentage of students not active ie 86.84%. The low activity of students in learning is possible can lead to low learning outcomes. Based on the search report documents the class X TKJ SMK Muhammadiyah 2 Ngawi found that student learning outcomes in some standard of competence has not been optimal, one of them the standard of competence diagnosing the problems the PC and peripherals. It can be seen from the UTS (Deuteronomy Central Semester) showing the first semester there are 23 students has a UTS value below a minimum completeness criteria (KKM) of the total student numbering 38. The percentage of students graduating KKM is 39.47%, while the percentage of students do not pass the KKM is 60.53%.

Based on the problems mentioned previously, it is necessary to study model innovation to improve the quality of learning. Learning is usually centered on the teacher using the lecture method may be replaced with the application of innovative learning.

Cooperative learning model of Numbered Heads Together (NHT) can be used on the grounds that the learning model can improve the understanding, cooperation, and activeness in learning. Cooperative learning model NHT divide students into groups whose members are heterogeneous. Students are actively discussed within the group in order to resolve the matter of discussion. The results of discussions they agreed to be understood by all group members. Random assignment in conveying the outcome of the discussion to make students more responsible for their group.

In order to achieve optimal learning, cooperative learning model NHT collaborated with active learning model type Giving Getting Question Answer (GQGA). NHT learning model application and GQGA is a collaboration of two models of learning that is expected to be a good combination. Collaborative learning model that can cover the shortage of learning models to one another. Active learning model type GQGA chosen to collaborate with cooperative learning model NHT reasons to make students more aware of the material being studied. Active learning model type GQGA aims to check students' understanding by asking and answering skills practice using paper media assistance. Students will be tested pamahamannya through debriefing between groups, so students will be challenged to recall any material that has been studied.

This research is expected to provide solutions to problems that occur in class X TKJ SMK Muhammadiyah 2 Ngawi. Studies conducted a type of classroom action research (PTK) entitled "Application of Learning Model NHT and GQGA to Increase Activity and Cognitive Learning Outcomes in Peripheral Repair Material Class X TKJ SMK Muhammadiyah 2 Ngawi".

Research purposes

1. Determine whether the application collaboration cooperative learning model NHT and active learning model type GQGA can enhance the activity of students of class X TKJ SMK Muhammadiyah 2 Ngawi on the improvement of peripherals.
2. Determine whether the application collaboration cooperative learning model NHT and active learning model type GQGA can improve cognitive achievement of students of class X TKJ SMK Muhammadiyah 2 Ngawi on the improvement of peripherals.

Literature review

Liveliness

Regarding liveliness, Dimyati and Mudjiono (2013: 51) argueds that it "is a motor activeness in learning activities and learning activities, students are required to always active learning process and recovery process". Simpson (2012: 12), citing the conclusion Diedrich in Hamalik stating that the activity of learning can be classified into 8 groups: (1) activities are visual, such as: reading, viewing pictures, watching experiments, demonstrations, exhibitions, and observe others work or play. (2) oral activities, such as: propose a facts or principles, connecting a goal, ask a question, give advice, opinions, interviews, discussions, and interruptions. (3) The activities to listen to, such as: listening to the presentation of the material, listen to conversations or group discussions, listening to a game, listening to the radio. (4) The activities of writing, such as: writing stories, write reports, check the composition, ingredients matter, make summaries, take tests, and fill out a questionnaire. (5) drawing activities, such as: drawing, make a graph, chart, diagram, map, and patterns. (6) The activities metrics, such as: conduct experiments, choose tools, carrying out exhibitions, dancing and gardening. (7) mental activities, such as: reflect, remember, solve problems, analyze the factors, see connections and make decisions. (8) The activities of emotional, such as: an interest, differentiate, bored, excited, eager, brave, quiet and nervous. Activity of students in this study can be assessed using a scale of 100 with the following formula:

$$\text{value} = \frac{\text{Achieved Score}}{\text{Maximum Score}} \, x \, Scale$$

(Source: Purwanto, 2014: 207)

Value liveliness that has been obtained by the students, categorized using the guidelines for student activity categories that can be calculated with the following formula:

$$= \, /.$$

$$\text{Interval distance (i)} \; = \frac{(\text{Top Score} - \text{ The Lowest Score})}{\text{The number of interval class}}$$

(Source: Widoyoko, 2016: 110)

According to the abovementioned formula, the desired category for this research there are 4 categories. The four categories include the category of very active, active, inactive, and inactive.

Based on discussions with teachers on the standards of competence make improvements to peripherals, the students said to be active if included in the category of "very active" or "active", while the students said to be active when in the category "less active" or "inactive". The result of the calculation formula is shown in Table 1.

Table 1. Category of Student Activity

Distance of Value	Category	Statement
76 – 100	Very Active	Active
51 – 75	Active	Active
26 – 50	Less Active	Inactive
0 – 25	Inactice	Inactive

Cognitive Learning Outcomes

Annurahman argues, "Actually learning can occur without learning, but learning outcomes will be apparent from a learning activity" (2014: 34). This is consistent with the conclusions Jihad and Haris (Santoso, 2015: 25) that the better the learning process and activate students in the learning process, the student should have the results obtained will be higher according to the objectives that have been defined previously.

Purwanto (2014: 49) bependapat, "The result of learning is the embodiment ability due to changes in current behavior of business education. Ability domain involves cognitive, affective, and psychomotor ".

One is the realm of cognitive learning outcomes. In connection with the cognitive, Jarolimek and Foster (Dimyati and Mudjiono 2013: 202) states that the purpose of cognitive domains associated with memories or the introduction of knowledge and information, as well as the development of intellectual skills. Syah (2003: 48) argues, "is the source simultaneously controlling Cognitive domains of other psychiatric, namely the affective domain (taste) and psychomotor (intention)".

Numbered Heads Together

Sarutobi (2010: 7) explained that the involvement of the student in learning can be realized through the use of a wide variety of learning models and learning media. Ahmadi, Amri, and Elisah argued, "Numbered Heads Together, was one method of learning where every student is given a number and then created a group was then randomly teacher calls the number of students" (2011: 59). "In general, NHT used to engage students in strengthening the understanding of learning or to check students' understanding of the learning material" (Daryanto and Rahardjo 2012: 245). In connection with the implementation of cooperative learning model NHT, the results Misu (2014) show that with the adoption of Numbered Heads Together (1) the participation of students in the group increased, so as to motivate students to learn solve problems in learning materials, (2) the thoroughness of learning outcomes in the first meeting of 37.5% with an average of 50.5, and then at a second meeting to 52.4% with a 52.9 average, then at the third meeting to 72.5 % with an average of 62.3.

Giving Question Getting Answers

Wijayanti (2014: 2), citing the conclusion Suprijono stated that GQGA developed to train students have the ability and skills to ask and answer questions.

Research Methods

This type of research is the Classroom Action Research (PTK) with the subjects in this study is a class X TKJ SMK Muhammadiyah 2 Ngawi. Sources of data obtained from informants, places, events, and behavior, as well as documents. Data collection techniques used in this study were interviews, observation, document analysis, and test. Test the validity of which is used for the qualitative data is source triangulation techniques, while the validity of the test is used for the quantitative data is the validation of the contents. Analysis of the data used for the qualitative data analysis techniques are critical, while the analysis of the data used for quantitative data is comparative descriptive technique. The performance indicators of this study was the increase in activity and cognitive learning outcomes of students in the material improvement of peripherals. The percentage of students formulated keakifan be at least 60%, while the percentage of cognitive learning outcomes of students who reached the KKM be formulated into a minimum of 70%. Research performance indicators are set based on the discussion with the teacher on the peripherals repair competency standards through consideration of the state of the initial conditions of the students. Student activity was measured from observation of student activity is then calculated the number of students who are active. Students are said to be active if it has a liveliness value ≥ 50. Results of tests measured the cognitive learning that then counted the number of students who pass. Students are said to be complete if it has a value above KKM, ie ≥ 75.

Results And Discussion

Pre-Action Data

Activities carried out at the stage of pre-action activities include observation and pre-test to determine the initial conditions before action is taken. Observations and pre-test conducted to determine activity of students, the results of cognitive learning, and the implementation of learning the material improvement of peripherals. Pre-action stage during two meetings held with each of the meetings scheduled 2 hour lesson.

Based on the observation of the implementation of learning at the pre-action stage, the role of teachers and students in learning looks not maximized. Some components of learning yet to be implemented, such as the teacher did not do apersepsi prior explanation subject matter, the discussion in the classroom has not been done, and there is no evaluation at the end of the lesson. The data on the observation at the stage of pre-action can be seen through some of the activities in learning. Activities that can be observed

in the learning material improvements to peripherals such as (1) visual activity: reading and watching. (2) Activities spoken: asking, answering, and participate in discussions. (3) Activities listening: listening to the teacher and listen to the conversation of discussion. (4) Activities movement: to experiment. (5) Activities writes: record discussions and work on the problems. (6) The mental activity: ready at the designated time and problem solving. (7) emotional Activities: passion and daring. Based on the observation that the activity has been carried out at the stage of pre-action can be seen the value of the activity of each student. Diagram percentage of student activity can be seen in Figure 1.

Figure 1. Percentage of Students activeness in Material Improvements Phase Pre Peripheral Actions

Based on the tests that have been conducted on pre-action stage can know the value of pre test each student, it can be calculated the average cognitive learning outcomes at the stage of pre-action, that is equal to 69.95. Diagram percentage of completeness cognitive learning outcomes of students at the pre-action stage can be seen in Figure 2.
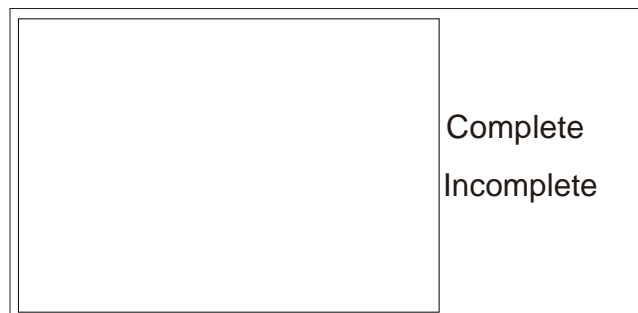

Figure 2. Percentage of Mastery Learning Outcomes Students Cognitive Domains Material Improvements Phase Pre Peripheral Actions

Data Cycle I

The first cycle was conducted over two meetings with the implementation phase covering action planning, action, observation, and reflection. Activities implemented in the planning stages of the first cycle is to create an implementation plan learning (RPP) to the basic competence fix peripherals, set up a division of the group, a matter of discussion, observation sheets, a matter for the post test, and tools needed to implement learning model NHT and GQGA. The activities carried out during the implementation phase activities include initial action, the core and the cover. Activity continued at a later stage of observation and reflection. Based on the observation that the activity has been carried out at this stage of the cycle I can know the value of the activity of each student. Diagram percentage of student activity can be seen in Figure 3.
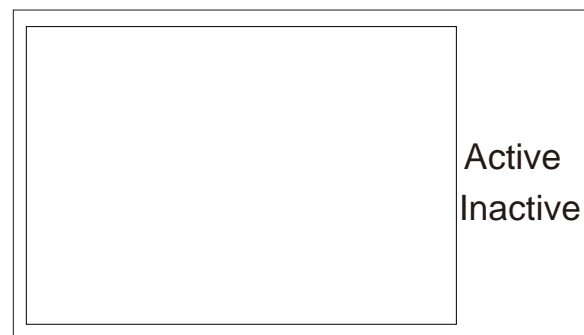
Active
Inactive

Figure 3. The percentage of active participation by students on Peripheral Repair MaterialCycle Phase I

Based on the tests that have been conducted on the stage of the first cycle can be seen the value of post test of each student, it can be calculated the average cognitive learning outcomes at this stage of the first cycle, which amounted to 70.46. Diagram percentage of completeness cognitive learning outcomes of students at the pre-action stage can be seen in Figure 4.
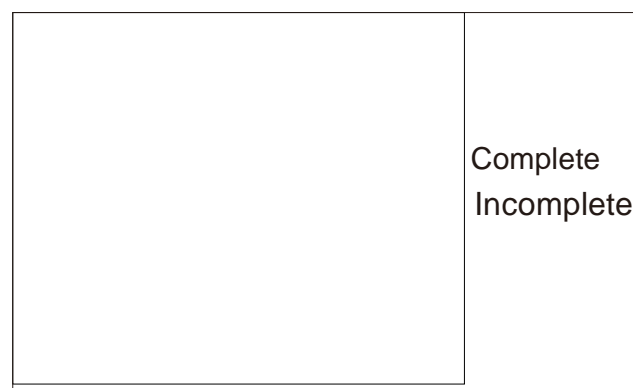

Complete
Incomplete

Figure 4. Percentage of Mastery Learning Outcomes Students Cognitive Domains on Peripheral Repair Material Cycle Phase I

Based on observations and tests on the stage of the first cycle can be seen that with the implementation of learning model NHT and GQGA increased activity and completeness of students when compared with the pre-action stage. It shows that through the action on the stage of the first cycle of active students can reach specified indicators are ≥60%, while the results of cognitive learning student has not reached the specified indicators are ≥70%.

Not to the achievement of specified indicators on cognitive learning outcomes, it is necessary to implement the action on the stage of the second cycle. Based on discussions with subject teachers can be concluded that the flaws in the first cycle stages such as (1) Not all members of the group participated in the discussion. (2) Allocation of time spent not on time as planned in the RPP. (3) Students who complete the repair material peripherals have not reached the specified indicators. It may be because the students do not understand the material identified.

Some of the shortcomings that occurred at the stage of the first cycle be used as repair materials for carrying out the action on the stage of the second cycle. Some improvements were implemented in the second cycle stages such as (1) The division of the original group of five members of each group was changed to four members of each group. (2) Teachers pay more attention to the allocation of time on each activity carried out in the application of learning model NHT and GQGA. (3) Video used as a medium of learning to help teachers explain the material to make it more attractive. (4) The teacher gives a task to do at home so that students better understand the material improvement of peripherals.

Data Cycle II

Implementation of the action on the stage of the second cycle is the result of a reflection on the cycle phase I. Phase II includes the execution of the cycle stage of action planning, action, observation, and reflection. The activities carried out at the planning stage of the second cycle is made lesson plan (RPP) to the basic competence check the results of improvements to peripherals, set up a division of the group,

a matter of discussion, observation sheets, a matter for the post test, learning videos, and tools needed to implement learning model NHT and GQGA. The division generated a heterogeneous group with respect to some aspects such as learning outcomes, gender, and background of the students. Each group consists of 4 people, are assigned to discuss appropriate questions that have been given a teacher. The activities carried out during the implementation phase activities include initial action, the core and the cover. Activity continued at a later stage of observation and reflection. Based on the observation that the activity has been held on the stage of the second cycle can be seen the value of the activity of each student. Diagram percentage of student activity can be seen in Figure 5.

Figure 5. Percentage of Students activeness on Peripheral Repair Material Cycle Phase II

Based on the tests that have been conducted on the stage of the second cycle can know the value of each post test students, it can be calculated the average cognitive learning outcomes at this stage of the second cycle, that is equal to the percentage of completeness 77. Diagram cognitive learning outcomes of students at the pre-action stage can be seen in Figure 6.
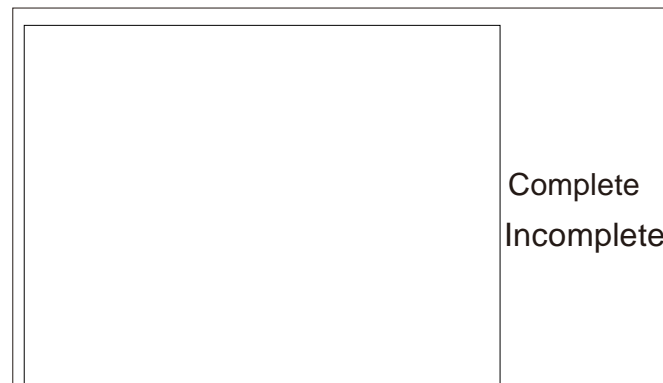

Figure 6. Percentage of completeness Students on Learning Outcomes Cognitive Domains Peripheral Repair Material Cycle Phase II

Based on data from observation and tests in the second cycle phase, it can be seen that through the implementation of learning model NHT and GQGA an increase when compared with the data at this stage of the cycle I. It shows that through action on the second cycle phase, activity and cognitive learning outcomes already can achieve specified indicators, ie ≥60% and ≥70% of students active students completed. The achievement of these indicators due to the application of the learning model NHT and GQGA at this stage of the second cycle is more optimal than the cycle phase I. The number of members of the group at this stage of the second cycle are less able to encourage students to be more aware of the materials studied, because the responsibilities of each member of the group for active in learning more. Assignment and use of instructional videos to make more interested in attention, so students a better understanding of the material being studied. Their understanding on the material tested by a question and answer activity at the end of the lesson, so that they will be challenged to recall any materials that have been studied previously.

Comparison of the Action's Outcome

Comparison of results of the actions of each cycle are as follows:

Liveliness

The percentage of the activity in each cycle has increased. Increasing the percentage of student activity obtained from the comparison of the percentage of student activity between cycles. Diagram comparison of the percentage of the activity at the stage of pre-action, the first cycle and the second cycle can be seen in Figure 7.
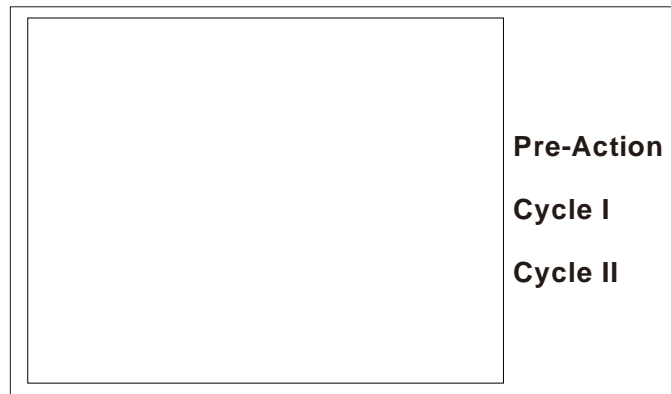

Figure 7. Comparison of Percentage of activeness

Cognitive Learning Outcomes

The percentage of the activity in each cycle has increased. Increasing the percentage of student activity obtained from the comparison of the percentage of student activity between cycles. Diagram comparison of the percentage of completeness cognitive achievement at the stage of pre-action, the first cycle and the second cycle can be seen in Figure 8.
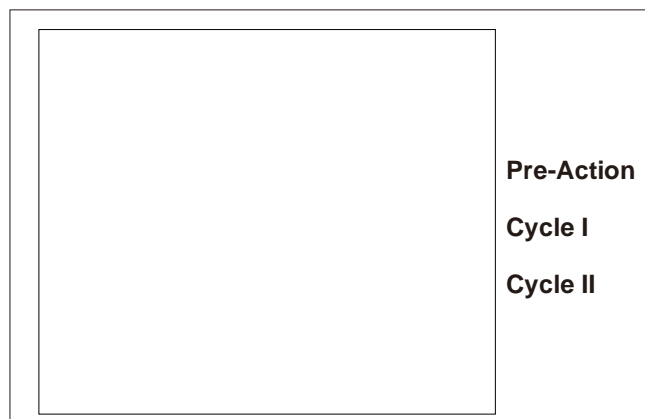

Figure 8. Comparison of Percentage Complete

Discussion

Based on observations and tests conducted before action is taken, it can be seen that the activity and student learning outcomes in the cognitive domain is low. Actions performed on each cycle impact on the increased activity and the thoroughness of cognitive learning outcomes of students. An increasing percentage of the activity at this stage of the cycle I is 42.10%, from 19.44% to 61.54%, while the percentage of completeness of students at this stage of the cycle I is 12.82%, from 38.46% to 51.28%. Student activity at this stage of the cycle I've reached the indicators of ≥60%, while the completeness of the students at this stage of the cycle I have not reached the specified indicators are ≥70%. As for the action on the second cycle need are conducted for the indicators on the cognitive learning outcomes of students has not been reached. An increasing percentage of the activity at this stage of the second cycle was 7.69%, from 61.54% to 69.23%, whereas the increase in the percentage of completeness at this stage of the second cycle is 20.51%, from 51.28% to 71.79%. Activeness and completeness of students in the second cycle phase has reached indicators of ≥60% of students said to be active, and ≥70% of students said to be complete\

As with the research Simpson (2012) which shows that the cooperative learning model NHT can be well applied so as to increase the activity in the high category and student achievement has been completed in accordance KKM. The results of research Hidayat (2011) which concluded that the application of the model GQGA can increase the activity and results of students of class IV SDN Kidul Dalem 2 Malang.

Conclusions and Suggestions

Conclusion

1. The application of NHT and GQGA collaboration can enhance the activity of students of class X TKJ SMK Muhammadiyah 2 Ngawi in the academic year 2015/2016.
2. Application of collaboration NHT and GQGA can improve cognitive achievement of students of class X TKJ SMK Muhammadiyah 2 Ngawi in the academic year 2015/2016.

Suggestion

1. Further research on the activity, the results of cognitive learning, and application collaboration and GQGA NHT do more leverage by other researchers.
2. Application of collaborative learning model NHT and GQGA requires proper allocation of time on making lesson plans so that all components can be executed.

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