

Teaching Higher Order Thinking Skills to Promote Islamic Junior High School Students' Achievement in English Classroom

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Abstract

The research aimed at investigating (1) whether or not there was improvement on students' achievement in English subject after the implementation of scientific approach and Higher Order Thinking Skills (HOTS,) and (2) what were the students' perceptions towards the learning activities conducted at one of Islamic Junior High School in Salatiga consisting of 34 students. The study used Quantitative Method with Pre-Experimental approach by applying Pretest-Posttest design in order to see whether there was improvement or not prior to the implementation of the collaboration of scientific and higher order thinking skills (HOTS) and after the implementation of that teaching method. In order to gain the data of students' English achievement, the test was administered to the students. Meanwhile, in order to see the students' perception, the likert scale questionnaire items which comprised of 20 items was administered. The results showed that there was improvement on students' achievement which was reflected from the significant improvement between the results of pretest and posttest. In other words, the profile of learning – teaching activities after practicing the collaboration of scientific and higher order thinking skills (HOTS) is improved. Furthermore, the results of questionnaire reflected that students had positive perceptions towards the learning activities.

Keywords: achievement, English class, higher order thinking skills, madrasa, scientific approach

Introduction

A range of efforts has been made by Indonesian government to improve the quality of education and to answer the global challenge of the 21st century era, in which people are demanded to have various skills to help them function in many societal elements. One of the changes is by reformulating the curriculum which currently known as The 2013 Curriculum. According to the Deputy Minister of Education of the Republic of Indonesia (2014), developing curriculum to be applied in schools is conducted to prepare student competencies in the future, such as communication skills, critical thinking skills, and so on. The 2013 Curriculum itself emphasizes on not only competences but also character buildings i.e. the students under such a curriculum system are expected to be able to construct their knowledge and take most benefits from the process of meaningful learning activities experienced while having good ethics and moral principles (Ratnaningsih, 2017).

Further, scientific approach is regarded to be one of primary tools in The 2013 Curriculum to achieve learning goals (Ratnaningsih, 2017). It entails the principle that the

process undergone by students has the same importance as the learning outcomes. In relation to that, teaching and learning activity, hence, should encourage students to be fully engaged by creating more meaningful, experiential, and active learning (Indrilla, 2018; Ratnaningsih, 2017). In this approach, five elements are introduced namely, (1) Observing: to develop students' curiosity and stimulate learning (Brown, 2000); (2) Asking: to improve students' questioning and thinking skills (Gallagher, 2015); (3) Exploring: to connect the concept to the reality (Suharyadi, 2013); (4) Associating: to attain the conclusion of knowledge by activating logical thinking process (Ratnaningsih, 2017); and (5) Communicating: to enhance students' skills in presenting or demonstrating the knowledge (Suharyadi, 2013).

English, in the other hand, is one of the subjects demanded to adapt scientific approach in its planning or teaching and learning activity in order to reach more meaningful learning process and optimal learning output. During its implementation in English classes, scientific approach receives various responses from educators, in terms of its application, and the challenges they meet in the field. Based on the preliminary data we obtained from the Principal of MTs N Salatiga, the teachers have already applied K13 with the Scientific Approach with a 5M pattern (Observing, Asking, Exploring, Associating, and Communicating) in their teaching and learning process. However, observation data obtained from the English classes attended and interview sessions with the teacher showed that the teachers found difficulties to put such approach into practice and to decide which technical parameter to be used to measure its success level. Similarly, teaching and learning processes were dominated by the use of textbook –discussing material from textbooks, reading material from textbooks together, and then working on practice questions – instead of using various forms of media. Learning activities the students have done, likewise, did not seem to improve their higher order thinking skills (HOTS). Then, after the implementation of scientific approach at MTs N Salatiga carefully examined by the researchers, this approach was apparently lack of practical and technical guidance on its application in teaching and learning activities.

Previous studies about scientific approach have actually been conducted by many researchers in recent years. Some of them focused on the use of media for maximizing the strength of scientific approach in English subject (Sriwahyuni, 2015). The other examined the effectiveness of the scientific approach to improve student learning outcomes (Firman & Murtini, 2018). There were also some research conducted in natural science subject (Prasasti, 2016) and math (Suhendri, 2015). However, it seems that there was not yet a research which focused on the implementation of scientific approach by putting HOTS inside. Derived from the above rationale, this study was focused on putting scientific approach and HOT into collaboration to be practiced in the classroom in order to test if there is improvement on students' achievement in English subject. In addition to that, students' perceptions toward its implementation were also uncovered to gain meaningful feedback for future development. Such a collaborative approach was conducted in expectation that it would train the students to think more critically

Meanwhile, scientific approach would be supported by HOTS. As the results, students are able to understand the information and analyze the learning process. They can find the ideas of that information, then draw the conclusion and classify its information. Thus students are able to think deeply and produce a quality thought.

Literature Review

Madrasa

Literally the madrasa is interpreted as a place of learning for students, or a place to give lessons or other names of schools even though at first the word school itself is not from the Indonesian language (Nakosteen, 1996). In practice, there are indeed madrassas which in addition to teaching the religious sciences (*al- 'ulum al-diiyyah*), also teach the sciences taught in public schools. In addition there are madrassas that only specialize in religious studies, which are commonly called madrasas diniyah.

Madrasas in the classical Islamic period vary in definition such as, schule or hochschule (Germany), school, university / college or academy (English) (Nakosteen, 1996; George & Makdisi, 1970; Syalabi, 1987). In the early 20th century, many people think that madrasas were actually another form of school, only given Islamic content and features. Since the appearance, madrasas in Indonesia have adopted a modern school system with characteristics: the use of a class system, grouping of lessons, the use of benches and the inclusion of general knowledge as part of their curriculum. Madrasa education institution is gradually being accepted as one of the Islamic educational institutions which also play a role in the development of improving the quality of education in Indonesia (Fadjar, 1998; Kareel & Steenbrink, 1982; Suminto, 1985). The long period of time it passed, which is about a century, proves that madrasa education institutions have been able to survive with their own character, namely as an educational institution to foster the spirit of religion and morals of students. The character distinguishes madrasa from public schools.

In line with the enactment of the 2003 National Education System Law which aligned the position of madrasas with public schools, it was only natural that the Ministry of Religion think of programs being developed by the Education Office, in the management of education and quality improvement of madrasas. In this case, madrasas can implement Madrasa Based Management in order to compare with public schools from the quality of their education (Freire, 1999; Harahap, 1998; Pelikan, 1992). Madrasa as an Islamic education institution is needed by the Indonesian people, considering that the majority of the citizens are Muslims. Madrasas as an important part of the education system in Indonesia, have the function of preparing the students to be able to face their future in the reality of life. Therefore, it is necessary to strengthen the foreign languages such as English.

Learning English

Nowadays, having a good skill in using English language actively is considered as one of the most important requirements to compete in global era. Without question, English skills can help individuals not only in their career but also in their efforts to understand more knowledge from experts around the world. It turns out that many countries compete to set English as language to be mastered by their citizens. Having those facts, Indonesian government also put it as mandatory subject to be learnt by students and inserted it in their newest form of curriculum system, The 2013 Curriculum, in that English is obliged for junior and senior high schools. For elementary schools, it may be taken as an alternative extracurricular subject. Then, in terms of English teaching and learning purpose, the curriculum also requires educators to design syllabus

and lesson plans, and activities which are engaging for students and enable them to develop their knowledge and thinking skills. Hence, scientific approach is introduced to help educators reach the goals, which includes observing, asking questions, gathering information / trying, reasoning / associating, and communicating.

English is a language material that must be mastered by everyone, especially for elementary students, it is very important to be given, because as a provision to study all science in order to master the concepts and principles. Learning English has a purpose, namely the results achieved in the components of English that are mastered by students. The curriculum is a set of plans regarding the purpose, content and material of the lesson as well as the methods used as guidelines for organizing learning activities to achieve certain educational goals. The 2013 curriculum aims to prepare Indonesian people to have life skills as individuals and citizens who are faithful, productive, creative, innovative, and affective and able to contribute to the life of the community, nation, state and world civilization (Law No. 20 of 2003; PP No. 19, .2005; Permendikbud No. 58 of 2014). 2013 curriculum uses a direct instructional and indirect instructional. Direct instructional is learning that develops knowledge, thinking skills and skills using students' knowledge through direct interaction with learning resources designed in syllabus and lesson plans. Here, students are observing, asking questions, gathering information / trying, reasoning / associating, and communicating.

High order thinking skills

The definition of higher order thinking skills, namely a cognitive process derived from Bloom's taxonomy sequence which includes analysis, evaluation, and creating in (Brookhart, 2015; Cottrel, 2005; Syafa'ah & Handayani, 2015) . Each level of thinking ability in Bloom's taxonomy guides students to master higher abilities. In the learning activities, to facilitate the teacher in guiding students to reach each level in Bloom's taxonomy at the revised level of high order thinking skill can be used in the table below which explains each level of HOTS in learning to be achieved and verbs that can be used in learning.

Table 1. Levels of HOTS and operational words

Levels of HOTS	Operational Words
Analysis: can the students distinguish between different concepts?	Assess, compare, criticize, sort, distinguish, determine.
Evaluation: can students justify a particular statement or choice by giving reasons	Evaluating, assessing, criticizing, selecting, connecting, giving opinions.
Create: can the student make or develop a product, new theory or point of view based on learning?	Assemble, design, design, make, formulate.

There is a positive relationship between the level of high order thinking skills and gender, academic results, and socio-economic status. Therefore, students must learn high order thinking skills to help them to solve problems in learning and improve their academic results (Heong, 2011; Johnson, 2009). There are three components of high order thinking skills, namely the ability to think, habits of thought and metacognitive which can be improved by giving the problem in the form of open-ended questions, assignments in class and feedback in learning to

face the challenges of work and daily life (Ramos, Dolipas & Villamor 2013; Sulaiman, 2017). The basis of the assessment of higher order thinking skills is the basic principle for conducting research on higher abilities in the form of an instrument that involves critical thinking skills, problem solving and creativity that can challenge students so that certain assessment instruments are needed based on related competencies in learning.

Based on Bloom's taxonomic dimensions that have been revised by (Agung, 2010), critical thinking skills occupy a part of the analysis (C4), and evaluation (C5), and are identified into 5 categories: a) Basic clarification, b) support basic, c) conclude, d) advanced clarification, e) strategies and tactics detailed with indicators of critical thinking test questions, especially those in the form of descriptions (Mundilarto, 2010;). The ability to think creatively can be the starting point to train critical thinking skills based on several experts grouped into four aspects, namely (a) fluency, shows the ability of students to give lots of ideas and solve problems with the right answers; (b) flexibility, shows the ability of students to solve problems in one way and then use many ways; (c) originality, students' ability to solve the problems using their own methods; and (d) elaboration, shows the ability to solve problems by carrying out detailed steps (Munandar, 2002).

The development of English learning questions to measure analytical skills, synthesis, evaluation can be carried out by presenting a stimulus in the form of experimental data, graphs, images of a phenomenon or a brief description of a phenomenon to answer questions in the form of multiple choices or descriptions. In general, techniques of writing question of high order think are almost the same as ordinary question writing techniques but because students are tested in the process of analysis, synthesis or evaluation, in the problem there must be components that can be analyzed, synthesized or evaluated.

In addition, English questions must also test English process skills. Therefore, the verb chosen in the cognitive domain is prioritized according to the process skills. For English questions, the teacher can choose verbs that are in accordance with the English concepts learned by students and in accordance with the learning outcomes indicators derived from basic competencies that must be achieved by students. In writing questions for high order thinking skills development (HOTS), we must first know that high order thinking is divided into four groups, namely problem solving, making decisions, critical thinking and creative thinking.

There are several ways that can be used as guidelines by the authors of the questions to write items that require high reasoning. The tricks are like the following; (1) the material to be asked is measured by behavior: understanding, application, synthesis, analysis, or evaluation (not just memory), (2) each question is given a stimulus question. So that the items written can demand high reasoning, then each item is always given a basic question (stimulus) in form of the reading source / material, (3) Measuring critical thinking skills.

There are 11 critical thinking skills that can be used as the basis for writing question that require high reasoning. (a) Focus on the question; (b) Analyze the argument; (c) Consider what can be trusted; (d) Consider observation reports; (e) Comparing conclusions; (f) Determining conclusions; (g) Consider the ability of induction; (h) Assessing; (i) Define the Concept; (j) Define the assumptions; , (k) Describe (Rosana, 2014). Higher Order Thinking (HOT) Strategy is a strategy that uses a high order thinking process that encourages students to search for and to explore their own information in search of structures and the underlying relationships, using facts that are available effectively and precisely to solve problems. There are three reasons why you should use HOTS in learning, namely: (a) Understanding information, (b) Quality thinking

processes, (c) Quality final results. In implementing this strategy, students are given suggestions or instructions to solve mathematical problems which are useful to train students to think complexly. In using this strategy, the teacher determines the level at which students will be directed, the goals and planning are clear and directed in each implementation of the learning process. In the following table, the implementation of the scientific approach and HOTS strategy can be used as an English learning activity in class VIII MTS N.

Table 2. Implementation of the scientific approach with higher order thinking skills strategies in English teaching and learning activities

Scientific Approach	Higher Order Thinking
Observe	Problem classification 1. What do you know about the problem? 2. What was asked about the problem? 3. What information is needed
Ask	Disclosure of opinion 1. Think about the way taken in solving the problem? 2. Do I need all the available information? 3. Can this problem be solved in one step or more?
Explore	Select and implement 1. Rewrite the model you made 2. Complete with the theory you have learned
Associate	Evaluation 1. Proof to test the answer 2. Does the answer make sense or not?
Communicate	

Note. This table is previously discussed by Suhendri, 2015.

Methodology

Research design

This research uses quantitative research with Pre-Experimental Research. Pre-Experimental research which is actually parts of Experimental research. According to Gay, Geoffre and Airasian (2012), the experimental method is the only method of the research that can truly test hypotheses concerning cause and effect relationships. Furthermore, experimental researchers test and idea (or practice or procedure) to determine its effect on an outcome.

Data collection

The data in this research were collected through test and questionnaire which served different but intertwined objective. In order to see students' English achievement, English test was administered to the students. In order to ensure the validity of the test the test was already checked by the expert of English Language teaching in order to see whether the items were appropriate to be given to the students. The feedback gained from expert's judgment was positive, where the English test items were suitable to be administered. Meanwhile, in order to

ensure the reliability, the test was already tried out. The results of the try-out were analyzed by using SPSS 20. It showed that the alpha value was 0.8. It means that the test items were reliable to be administered.

Meanwhile, in order to see students' perceptions toward the learning activities, the questionnaire was used. There are 20 items of the questionnaire with Likert-Scale. There are four indicators that would like to be assessed. 1) students' perceptions in participating in learning, especially at the stage of observing in 5M; 2) students' perceptions in understanding English subject in the presence of a scientific approach that is collaborated with high order thinking skills; 3) students' perceptions of their motivation to continue to improve their English skills and 4) Students' perceptions toward the teachers' way in teaching English lessons using a scientific approach that is collaborated with high order thinking skills.

Data analysis

The data analysis technique used is quantitative data analysis by using SPSS version 20.0. In order to see whether there was improvement of students' English achievement after they were treated by using scientific approach that was collaborated with high order thinking skills, T-Test was used as inferential statistical analysis. Meanwhile, in order to see students' perceptions towards learning activities, the data gained from the questionnaire were analyzed by using descriptive statistical analysis.

Findings

Students' English achievement after they were treated by using scientific approach collaborated with high order thinking skill

In order to see the influence of the use of the scientific approach collaboration and High Order Thinking Skills (HOTS) on the achievement of student learning outcomes for English subjects, We used Paired Sample Test on the SPSS with version 20.0 application. The following is the results:

Table 3. Result of T-test paired samples test

		Paired Differences			Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	
Pair 1	Pre-test – Post-test	-27,132	8,807	1,510	0,000

Based on table 1, it is known that the sig value. (2-tailed) of 0,000 <0,05, because of the sig value. (2-tailed) of 0,000 less than 0.05, it can be concluded that the use of Higher Order Thinking Skills (HOTS) for learning English in an effort to strengthen the quality of students at the madrasa level was stated to be increasing. In other words, there was significant improvement of students' achievement after they were treated by using the collaboration of scientific approach with HOTS (High Order Thinking Skills).

Students' perceptions toward learning activities

The results of the data gained from students' responses toward 20 items of Likert-Scale questionnaire items showed that most of students had positive perceptions toward learning activities which was reflected in 4 indicators mandated in the questionnaire as follows:

- a. Students were happy and interested in participating in learning, especially at the stage of observing in 5M,
- b. Students felt helped in understanding English subject in the presence of a scientific approach that is collaborated with high order thinking skills,
- c. By using a scientific approach and high order thinking skills (HOTS), students were motivated to continue to improve their English skills.
- d. Students liked the teachers' way in teaching English lessons using a scientific approach that was collaborated with high order thinking skills.

Discussion

This research employed students' treatment as follows: 1) Teaching and learning activities using collaborative scientific approaches with high order thinking skills (HOTS) ran according to the 5M sequence; 2) Students were encouraged to actively participate by being provoked to think higher; 3) Students felt comfortable and easier to understand the material presented; 4) The atmosphere of the teaching and learning process looked democratic with evident the interactions between students and teachers that were not monotonous, and 5) All elements in the learning implementation plan were implemented.

The result from pretest shows that students' achievement (score) before implementing HOTS has not reached KKM yet. Then, the researchers conducted scientific approach which was combined with HOTS (High Order Thinking Skills). From these results, it can be concluded that alternate hypothesis that stated that there was significant improvement after the collaboration implementation of scientific approach collaboration with the use of high order thinking skills was accepted and null hypothesis which stated that there was no improvement after the collaboration implementation of scientific approach with the use of high order thinking skills was rejected. To sum up, there is improvement on students' achievement in English language after the implementation of scientific approach and higher order thinking skills (HOTS).

The results of the research is in line with Heong, (2011) who stated that high order thinking is used to think widely to find out new challenges. Then it also creates someone to use new information or knowledge that one got and use that information to reach a better answer in a new situation while thinking. According to Brookhart (2015), HOTS is deliberately the top end of Bloom's cognitive taxonomy. So that, student are able to think clearly and briefly by depth analyzing in such new situation, especially in this collaborative research. The teaching goal behind any of the cognitive taxonomies is equipping students to be able to do transfer. "Being able to think" means students can apply the knowledge and skills they developed during their learning to new contexts. "New" here means applications that the student has not thought of before, not necessarily something universally new. Higher-order thinking is conceived as students being able to relate their learning to other elements beyond those they were taught to associate with it.

Meanwhile, the students' perceptions were resulted positively toward learning activities. It can be concluded that after the collaboration of the scientific approach was applied using high

order thinking skills in English subject: 1) Students were happy and interested in participating in learning, especially at the stage of observing in 5M; 2) Students felt helped in understanding English subject in the presence of a scientific approach that is collaborated with high order thinking skills; 3) By using a scientific approach and high order thinking skills (HOTS), students were motivated to continue to improve their English skills and 4) Students liked the teachers' way in teaching English lessons using a scientific approach that is collaborated with high order thinking skills.

Therefore, the results above show that the collaboration between scientific approach and high order thinking skills in English subject is helpful enough to engage students' participation in English subject. It means that it influences students' achievement in their grades, it was also reflected from positive students' perceptions toward learning activities. Thus, the two collaborations are successfully seen as students' improvement in learning English and their perceptions.

Conclusion

Based on the research results of classroom action research conducted at MTs Negeri Salatiga about efforts to improve the quality of madrasas with the collaboration of the implementation of the scientific approach and high order thinking skills (HOTS) in the odd semester of the 2018/2019 academic year, some conclusions can be drawn. The conclusion is presented as follows:

1. there was significant improvement of students' achievement after they were treated by using the collaboration of scientific approach with HOTS (High Order Thinking Skills)
2. Students showed positive perceptions toward learning activities.

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