

Students' attitudes toward preservation of the school environment through inquiry-based learning

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ABSTRACT

This research aimed to identify students' attitudes toward the preservation of the school environment during the learning process through inquiry-based learning. The research used a descriptive method, and data were collected through observation and interview. Data of behavioral character and social skills of the students were obtained using the format of observation sheet and interview guide. These attitudes were reflected in the students' behavioral character and social skills observed during the learning process. The behavioral character was indicated in their cooperation, appreciation to the others, and environment; while the social skill was mentioned in the skill of questioning. The result showed that the student's attitudes the school environment during the learning process were in good category viewed from behavioral character parameters (cooperation, appreciation to the others and environment). The social skill of the students was also in good category viewed from the skill of questioning.

Key words : Behavioral character, Social skill, Inquiry-based learning, Students.

Introduction

National education develops the ability, forms mindset, and dignified national civilization to create bright and educated citizens. National education develops student's potentials to develop human beings who believe in and obey their God, show good attitudes, and stay healthy, as well as having educated, skillful, creative, independent, democratic, and responsible attitudes (National Education System Legislation, 2003). Education is then a way to prepare human beings for being able to face challenges of the new era. Character education, especially environmental education, as a result of experts' evaluation and deepening on the 2013 curriculum can be implemented for the sake of answering the current and future educational problems.

The learning process of environmental education carried out should be a process of organizing values and clarifying concepts to foster the skills and attitudes needed to understand and respect human relations, culture, and physical environment. Knowledge and awareness of the existence and scope of environmental problems are essential because it can raise awareness and concern for the environment. The emphasis must be on (i) knowledge of causes, (ii) knowledge of effects, and (iii) knowledge of strategies for change when facing environmental problems.

Developing people with a character of caring about the environment can be conducted through effective environmental education in schools. Schools have a unique role in developing an awareness of the environment; schools can help students

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to understand the impact of human behavior on the earth, and become a learning place to maintain the sustainability of life. However, various environmental problems that are increasingly out of control show that Environmental Education has not succeeded in making human resources who are aware of the environment. According to Lee and William (2001), formally, environmental education is one of the rational alternatives for incorporating environmental education into the curriculum. Environmental education is one of the essential factors in the success of environmental management and is also a vital means of producing human resources who can implement the principle of sustainable development.

According to Nurjhani and Widodo (2009), environmental education is needed and must be given to children early so that they understand and do not damage the environment. Several aspects including: influence this ecological education:

1. Cognitive aspects. Environmental education has a function to increase understanding of environmental problems, also able to improve memory, application, analysis, and evaluation.
2. Affective aspects. Environmental education functions to increase acceptance, assessment, organization, and personality characteristics in managing life in harmony with nature.
3. Psychomotor aspects. Environmental education plays a role in imitating, manipulating in interacting with the surrounding environment to improve the culture of loving the environment.
4. Aspects of interest. Environmental education serves to increase children's attention.

One of the assessment aspects of students learning outcome in high schools is the attitude aspect (Rules of Education and Culture Minister, 2016). This assessment will portray the student's tangible attitude during the learning process. This attitude aspect is taught to them since the beginning to equip them to be part of the bigger society in the future.

The assessment process so far has been emphasizing on one aspect of knowledge only while ignoring the skill and attitude aspects. The learning assessment is to cover three dimensions: knowledge, skill, and attitude (Friedrich, 1972; Kasilingamet *al.*, 2014; Kuboja, 2015). If this is done, the assessment of the learning achievement will be then complete and thorough. One of the ways to do that is through inquiry-based learning.

Inquiry-based learning demands students to obtain both the learning result and process which cover knowledge, psychomotor, and attitude (Liu, 2010). The human regulation system concept is set to facilitate students to do observation. When learning an idea, students can observe, formulate problems, formulate a hypothesis, gather data, test hypothesis, and make conclusions related to the nerve system, endocrine system, and sensor system on the human being. They are trained to work together, to be tolerant of friends in one group, to be thorough, and to be persistent. The students' needs today is a learning process change from being told to find out and from the output based assessment to output and process-based assessment.

Eshun (2013) explained his observation on attitude indicators to obtain student assessment result. The attitude in learning is a learning outcome which focuses on their feeling. This is the basis of attitude and habit of the students in the future. Therefore, it is necessary to observe character attitude and social skill.

Attitude aspect can be trained to the students during the learning process. Inquiry-based learning model and the cooperative learning model can be used to explore the student's attitude. Inquiry-based learning process demands the students to be thorough, persistent, and responsible. Collaborative learning model requires the students to be tolerant and cooperative. Therefore, when these two models are used together in the learning process, it provides chances to the students to understand a learning concept and work together by sharing ideas among group members and at the same time keep being thorough, persistent, and responsible.

Inquiry-based learning model combines with the cooperative model aiming to make the learning meaningful (Bilgin, 2009; McConneyet *al.*, 2016). One of the significant learning criteria is a chance to ask (Meyer and Jones, 1993). When a student questions in the inquiry process during the learning, he or she plays an active role in developing an understanding which produces meaningful learning. This study aims to reveal students' attitudes toward the preservation of the school environment during the learning process through inquiry-based learning.

Methodology

This research was conducted in a Public Senior High School, Banjarbaru. Interview and observation

(descriptive study) were held four times to complete the concept of the human regulatory system. The research subjects were eleventh graders of High School. The focus of the research was five students with different academic abilities.

Learning in the inquiry-based setting with a combination of cooperative learning models at the time of application in the classroom. Collaborative learning facilitates students working in groups. Furthermore, the students' attitudes towards their friends in their group and the environmental preservation during the learning process were observed by three observers.

The indicators of behavioral character are cooperation and respect to the other friends, while that of preservation of the school environment was students' participation in the environmental program and their care on the ecological problem. The indicator of social skill was questioning. The data are gathered through observation using instruments of behavioral character and social competence. The data analysis is descriptive and categorized with scales: very good (A), good (B), sufficient (C), and low (D).

Behavioral character (cooperation) is observed using five parameters: very good (5), good (4), sufficient (3), and low (1-2). Behavioral character (respect to the others) can be observed using six parameters: very good (6), good (4-5), sufficient (3),

and low (1-2). Social skill (questioning) is observed using four parameters: very good (4), good (3), sufficient (2), and low (1). Researchers observed the students by giving a checkmark on the rubric based on the attitude that appears during the learning takes place. The category is very good, good, sufficient and less determined by the quantity of appearance of the attitude shown by the students.

Findings and Discussion

Students' Behavioral Character

Observation result of the students' behavioral character is displayed in Table 1.

Table 1 shows that the cooperation of the students in learning is good. The observed result of students' behavioral character (appreciate friends) is displayed in Table 2.

Table 1 showed that respecting to the other students of the eleventh grade of IPA 1 and caring for their school environment have been well performed. Kamaruddin (2012) mentions that character building is an integral part of the learning process. The behavioral character showed by the students was the result of exercise/habituation through inquiry-based learning. The steps to find concept understanding in the inquiry process demanded the students work together to achieve the shared goals.

Table 1. Observation result of the student cooperation behavior

Category	Cooperation								Average (%)
	Meeting 1		Meeting 2		Meeting 3		Meeting 4		
	Σ	%	Σ	%	Σ	%	Σ	%	
A	0	0	2	40	3	60	3	60	40
B	4	80	3	60	2	40	2	40	55
C	1	20	0	0	0	0	0	0	5
D	0	0	0	0	0	0	0	0	0

Category: A = very good, B = good, C = sufficient, D = low

Table 2. Observation result of respect to the others-behavior

Category	Respect to the others								Average (%)
	Meeting 1		Meeting 2		Meeting 3		Meeting 4		
	Σ	%	Σ	%	Σ	%	Σ	%	
A	0	0	2	40	4	80	4	80	50
B	5	100	3	60	1	20	1	20	50
C	0	0	0	0	0	0	0	0	0
D	0	0	0	0	0	0	0	0	0

Category: A = very good, B = good, C = sufficient, D = low

Slavin (2006) argues that cooperative learning is a fundamental part to grow and develop students' moral and character. The assignments that are given to the students during the learning process can stimulate the students' curiosity (Ermawati and Abidin, 2015). The combination of both leads to the student's activeness in exploring and finding out the answer to their interest. When they work together to achieve specific goals in accomplishing the group task, they have to have a sympathetic character to make cooperation among peers goes well. In other words, teamwork (working together) and respect can be accommodated and facilitated through inquiry-based learning in the cooperative setting. Moreover, when the students were involved in the program of environmental care, they seemed they got much knowledge and information as well as curiosity.

Character is what determines human quality (Lexmond and Richard, 2009). Therefore, a behavioral character is supposed to be implemented in human life, such as during school life. The learning process happening at school then is supposed to grow the student's awareness and habituate character education in them. For that, we need serious learning planning so that learning outcomes can be achieved.

The result of this research shows that the lesson plan instrument is useful in use based on good students' accomplishment on cognitive learning, very well critical thinking skill, a good result of behavior assessment, good social skills, and good students' activity (Zaini 2016; Wahyulina *et al.*, 2018). Lesson Plan is sufficient to be used based on 1) student learning outcomes (product and process) that have exceeded the classical completeness, 2) student performance skills are very good, 3) student behavioral character (discipline and responsibility) is very good, 4) student social skills (collaborating and contributing ideas) are mostly very good, and 5) student skills are good (Zaini, 2018).

The observation on the students' behavioral character which has been done four times has shown the results that generally behavioral characters of the students are in a good category; some students' behavioral characters are in a very good category, and fair category only showed up in one person and one meeting. It indicates that the behavioral character which is viewed from cooperation and appreciativeness aspects have been integrated into their selves through the learning process. It can be inferred that

there is some relation between behavioral character of the students and the learning process applied in the classroom.

Environmental education given to the students gradually began of a cleanliness issue, waste segregation, treatment plants, the utilization of waste. Environmental education will be effective when the school makes the system stimulant (incentive), rewards, and punishment in developing appropriate attitudes and behavior of the students love the environment (Coyle, 2004). Character education in caring for the surrounding environment is one of the eighteen characters established by the Curriculum Center of the Ministry of Education and Culture. This kind of education aims at building a positive attitude, e.g. a person has to improve and manage the environment beneficially and adequately so that it can be continuously enjoyed without damaging the condition, help to preserve it to maintain sustainable benefits. Coyle argues that attitudes and behavior of teachers towards the school environment shown is a part of the efforts to establish the students' attitudes and behavior towards the environment around the student (Coyle, 2004).

Ballantyne and Packer (2002) suggest that learning an experience-based learning environment is very important to foster students' attitudes and actions towards environmental awareness. Littledyke (2008) also note that the joint development of a positive approach to science and environmental issues through active learning through constructivist pedagogy, experience the natural environment and living organisms, and the science curriculum that emphasizes conceptual integration to show the environmental impact complex in addressing social and environmental issues.

Environmental education aims to develop habits to manage the environment, avoid environmental destruction, foster sensitivity to the environment, instill responsibility for the environment, and educate students to be examples of environmental savors in life wherever they are. The notion that student's behavior becomes better after the learning program through inquiry (Riegle-Crumb *et al.*, 2015) has gone along with this research result. It is indicated by the findings which shows the behavioral characters of the students viewed from cooperation and appreciativeness indicators in four-time meetings. The percentage of behavioral characters of the students in cooperation aspects shows that 80% is in good category and 20% is in fair category (meeting

1), 40% is in very good category and 60% is in good category (meeting 2), 60% is in very good category and 40% are in good category (meeting 3 and 4). Meanwhile, in appreciativeness aspect, it is found out that 100% is in good category (meeting 1), 40% is in very good category, and 60% is in good category (meeting 2), 80% is in very good category and 20% is in good category (meeting 3 and 4). Appreciativeness also has a positive correlation with cooperation, which is showed by the students in their group performance.

Inquiry-based learning directs the students to build understanding during their group works (Bayram *et al.*, 2013). The students are divided into groups heterogeneously consisting of students with different abilities, sexes, and ethnics. Such a group is meant to learn together as a team to achieve shared goals. Inquiry-based learning which is designed to be cooperative can facilitate students to learn in a group and try to make a discovery (as a shared goal) which is part of their inquiry tasks.

Inquiry-based learning can be combined with cooperative learning (Alberta, 2005). The behavioral character of the students can be stimulated through the teaching, which is designed to make students work together in a group and cooperate to achieve shared goals. In the process to achieve the goals, the students are demanded to be able to appreciate each other so that their purpose can be achieved by collecting and accommodating different ideas and notions from each group members. This is relevant to what was stated by Harlen (2014) that student's interaction among themselves could be developed when they work on inquiry tasks in inquiry-based learning. Therefore, the inquiry-based model is considered relevant in training the students to have behavioral character.

A study conducted to senior high school with quasi-experimental research aims to examine the effects of guided-inquiry based learning on the concept of ecosystem towards learning outcomes and critical thinking skill of high school students showed that guided-inquiry based learning has effect towards learning outcome of cognitive products, guided-inquiry based learning has effect towards learning outcome of cognitive process, students' critical thinking skills include: formulate problems, formulate hypothesis, collect data, analyzed data, and make conclusion on average categorized as good enough (Zaini, 2018). In vocational school the application of the result of critical think-

ing, performance appraisal results, cognitive appraisal result showed that environment-oriented natural science's module using the concept of pollution and wastes are considered effective (Maslynieta *et al.*, 2018).

Willingness to cooperate with other people emerges in the students during the inquiry-based learning process; this is supported by Munusamy (2016) who states that when the students learn with inquiry-based cooperative learning strategy, they will start identifying the abilities of each group members, cooperate in small groups and show combined group members' skills. The researcher discovers that their appreciative attitude towards one another influences identification done by the group towards its members and the cooperation among them which form group performance — inquiry-based cooperative learning than does not only result cooperatively but also grateful attitude.

Suwondo and Wulandari (2013) find out that most of the students from the two groups (2011 and 2012) achieved good scores in inquiry-based learning. The records on their characteristics also point out that they mostly have the right attitude. Their cooperation within four-time observation also shows good category with an average score of 55%, followed by very good category with average rating 40%; and only 5% which are categorized as fair. The students' appreciation towards their friends' opinions is also in good and very good categories, with an average score of 50% for each of both categories.

Inquiry-based learning process demands the students to pay their attention in the class discussion and participate actively in group work (Maxwell *et al.*, 2015). In the group, the students are assigned with a task that would lead to the participation of each group member. The students need to be trained to appreciate their friends to achieve success since during the cooperation process, and there might be differences in opinions among them. The research result shows that inquiry-based learning model, which is arranged cooperatively inures them to show appreciation to their friends which is in good to very good category.

Inquiry-based learning is related to students' tendencies for positive attitudes (Veloo *et al.*, 2013). The development of cooperative and appreciative attitudes was found in students of class XI IPA 1 of SMAN 2 Banjarbaru. The students are demanded to show their maximum potential in the inquiry-based learning to train them to be more cooperative be-

tween and another to optimally achieve their goals of education. In other words, inquiry-based learning is one of the learning strategies that is meant to involve all the students' potential to search for and investigate something (objects, people or events) systematically, critically, logically, analytically so that they can formulate their findings with confidence.

The finding of the research shows the increase from fair category to good category and at the end moves to very good category (in the fourth/last meeting) which indicates that there is a development in the students' behavioral character from one meeting to another.

Social Skill

Students' social skill in one group, as the researcher observed, is conducted to group three. The observation result on social skill in questioning aspect during the learning process is displayed in Table 3.

Observation on the social skill of the students during the learning process displayed in Table 3 shows that category variation starts from fair, good, to very good. However, all of them are dominated by good and very good categories.

The learning resulted from inquiry-based learning is expected to establish students' social skill. Questions and answers are required in inquiry-based learning, namely: when the students are involved in the activities of observation, discussion, and presentation. All of those are aspects of social skills. Asking questions in inquiry learning becomes an exercise to improve the students' quality of both oral and written communication. The cooperative learning model is used to obtain at least three learning goals; they are to fix the academic learning outcome, individual acceptance and social skill development (Lestari, 2012). The social skill of the students, when it is observed through a questioning parameter, shows category variations of attitudes

on each student in one group which generally are positive. Some students have very good social skills, and some others have good social skills, although some students have only fair social skills at the beginning of the meeting.

Learning by implementing a cooperative model requires students to be tolerant and work together in the learning process. In other words, the use of this model can provide opportunities for students to understand the concept of learning by working in groups through sharing various ideas from each group member who is working together. In group learning, students are given chances to interact with each other; explain each different definition of a concept to his or her peers. The interaction happening among students in a group leads them to ask each other and clarify in return when they try to understand a concept or solve the problem together. The visible result of the social skill of the students are generally in good category and goes along with Lestari (2012) research result that children social skill can develop well when the learning process is set to be in the group. This also supports the theory of Vygotsky (1996), who explains that social interaction plays the central primary role in students' knowledge development. Student social interaction during the learning process has a positive correlation with his or her ability to understand certain concepts as a result of questioning each other or digging information from one another.

The result on the students' social skill also indicates that during the learning process, a lot of students were involved in active participation and cooperated with their group members to work on the problem in the workbook. Learning activities require communication, collaboration, and engagement. In small groups, individuals involved enable to get the same quality and quantity of activities. The number and variety of activities reflect the participation of each individual in responding to any

Table 3. Observation Result of Questioning Skill

Category	Questioning								Average (%)
	Meeting 1		Meeting 2		Meeting 3		Meeting 4		
	Σ	%	Σ	%	Σ	%	Σ	%	
A	0	0	2	40	3	60	3	60	40
B	3	60	3	60	2	40	2	40	50
C	2	40	0	0	0	0	0	0	10
D	0	0	0	0	0	0	0	0	0

Category: A = very good, B = good, C = sufficient, D = low

stimuli received. The cooperative activity can be in the form of discussion among group members through questioning and answering. The conclusion that questioning skill of the students can be trained in the group discussion is also in line with Prayitno's (2012) research result which reported STAD cooperative learning model in which students' study among them can facilitate the scaffolding process through peer tutoring. In other words, the inquiry-based learning model can be implemented to grow students' social skill, as the research points out.

One of the active learning characteristics is that students do not only listen to the passive learning material but work on something related to the learning (Rooijackers, 1991). Inquiry-based learning trains the students to explore questions, find the answer, and share knowledge with others (Murdoch, 2005), meaning that the inquiry approach puts students as learning subjects. Students get a learning experience which makes them possess individual learning ability in a learning material concept. The learning experience occurs during the learning process. As long as students try to find out that concept, a questioning skill will appear within them.

During specific periods, students who learn through inquiry-based learning will test their ideas or other people who work with them, ask each other, communicate ideas, and appreciate other people (Harlen, 2014). These attitudes can occur through these activities. In conclusion, character attitude and social skill can be facilitated through inquiry-based learning.

Conclusion

Inquiry-based learning at senior high school can help students to achieve good character and social skills. Behavioral characters include cooperation that reaches a good category (55%) and appreciates friends who reach good category (50%) and very good (50%). The social skills of students, which include indicators of questioning skills, have reached the good category (50%). Therefore, it is recommended that inquiry-based learning can be applied in the classroom by teachers and in the implementation, it is expected that the teacher is aware of any other possible factors, such as students' condition, subject concept, and time allotment available for the learning process.

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