

Conference Paper

Nurturing Conservation - Minded Behavior of Students of Agricultural Mechanization Program, Vocational School using Contextual Learning Strategy

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Abstract

This study aims to figure out: (1) the implementation of contextual learning strategy in environmental education course; (2) the learning outcomes of the environmental education using contextual learning strategy during the debriefing of the internship program; (3) conservation-minded behavior of the internship program participants; (4) the contribution of the environmental education learning outcomes using the contextual strategy in the internship program briefing on the conservation – minded behavior. The study was conducted at SMK N 1 Bawen and industry in Semarang and its surrounding districts in 2018. The data on the implementation of contextual strategy during the internship program debriefing were gathered using an observation sheet. The learning outcomes of the implementation of the contextual strategy in environmental education course during the debriefing of the internship program were gathered using a test sheet and the data on the conservation-minded behavior of the internship program participants were gathered using an observation sheet. Data analysis was conducted using the descriptive analysis and simple regression. This results of the study showed that; (1) the contextual strategy was implemented by providing additional materials during the environmental education course; (2) the students' learning outcomes of environmental education using the contextual strategy were mostly high; (3) the score of the conservation-minded behavior as the internship participants were high; (4) the contribution to the results of the contextual strategy implementation on the conservation education learning process was 86.8 percent to the conservation – minded behavior of the internship participants.

Keywords: the contextual strategy, conservation-minded behavior

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1. Introduction

The vision of the Agricultural Mechanization Program at the SMK N 1 Bawen is to produce graduates who are professionals in the Agriculture industry, environmentally friendly, and able to compete in the global era (Anonymous, 2013). The graduates of Agricultural Mechanization Program at the SMK N 1 Bawen are prepared to be professional

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Agriculture industry and have conservation – minded behavior. Therefore, the students of the Agricultural Mechanization Program join the internship program. The internship program is the practice of doing work in industry to master the competence with the industry standards (including conservation-minded behavior) (Anonymous, 2004).

The curriculum in Agricultural Mechanization Program in SMK 1 Bawen is oriented towards competency-based education. The students are expected to demonstrate science which is gained by integrating the existing life skill. The conservation education learning process emphasizes on the students' direct experience; the students are assisted in developing a number of process skills, namely: observing, hypothesizing, using materials and tools, asking, classifying, interpreting, communicating the results of his findings, classifying / gathering relevant information to test their ideas and solve their everyday problem.

In teaching process, teachers are required to be able to gather facts related to the subject, from the scope of daily life, from various media sources such as TV and the internet. For this reason, a learning strategy, which does not require students to memorize facts, but encourages students to construct knowledge, is needed to further activate the teacher and empower the students. There are several learning strategies including conventional strategies and contextual strategies

The first phase of the study of Sudarman, et al in SMK N 1 Bawen found that: (1) conservation education learning process in the Agricultural Mechanization Program was conducted using conventional strategies (72.71 percent); (2) the material has not led to the formation of conservation – minded behavior; (3) the conservation – minded behavior of the internship program participants in the Agricultural Mechanization Program of SMK N1 Bawen is categorized as low. This means the conservation education learning process in the Agricultural Mechanization Program in SMK N 1 Bawen was dominated by conventional learning process. The teacher transferred the knowledge by lecture, he wrote down important materials on the board, the question and answer session was conducted in a classical manner. The activities of students only passively listened to the lecture and recorded the written information on the board. These activities were certainly different from the expected activities in the curriculum of Agricultural Mechanization Program which is competence – based.

Based on the above description, the contextual learning strategy for Conservation Education course was designed to shape the conservation – minded behavior of the internship program participants in Agricultural Mechanization Program. The research problems can be formulated as follows: (1) How is the implementation of contextual learning strategy in Conservation Education learning process?; (2) What are the results

of the implementation of contextual learning strategy of in Conservation Education on internship program debriefing?; (3) How is the conservation - minded behavior of the internship participants after the implementation of contextual learning strategy in Conservation Education?: (4) What are the contributions of the implementation of contextual learning strategy in Conservation Education on conservation – minded behaviors of the internship program participants in the Agricultural Mechanization Program.

Conventional learning strategy is commonly called traditional method of teaching. This strategy does not make many changes in learning to adjust to the development of science. According to Jacobson (1989), the conventional learning strategy that is often used is starting the lesson by conveying learning objectives, then learning material presentations or teachers asking students to read textbooks, then ending the lesson with conclusions. The question and answer session remains focused on the teacher. Therefore, it is clear that the conventional learning strategies is teacher – centered. The interaction that occurs in the classroom is a one-way interaction. The interaction among students tend to lack even it may not happen. The students only do these following things: listen, record and possibly conclude. According to Kemp (1994), the conventional strategy in the learning process is passive because students are not engaged in exchanging ideas with teachers, and in classical classes, teachers usually can not recognize individual differences in students.

According to Stahl (1994), the characteristics of conventional learning strategies are: (a) students work for themselves; (b) students pay attention to the blackboard; (c) students work alone; (d) students learn only from teachers / student books / worksheets; (e) students listen to the teacher; (f) students concentrate on learning; (g) only teachers make decisions; (h) passive students.

From the description above, it can be concluded that conventional learning strategies are: planning and learning management, in which materials are transferred via classical lecture and the notes on the board, it is proceeded with questions and answer session, and the blackboard as the main media.

Contextual strategy (Contextual Teaching and Learning = CTL) is defined as the concept of learning that helps teachers relate between material taught with real situations and encourage students make the connection between the existing science and its implementation in the daily life as a member of the family / community. With this concept, the learning outcomes are expected to be more meaningful for students. The learning process is conducted naturally in the form of students' direct experience / work, not only the transfer of science from teacher to student by involving seven elements of

effective learning: constructivism, questioning, inquiry, modeling, learning community, and authentic assessment (Anonymous, 2002).

In the contextual class, the teacher helps the students to achieve the learning objectives. Teachers concern more about the learning strategies than providing information. The task of the teacher is to manage the class as a team to explore new concept / skills that come from the process of construction instead of the teachers' lecture. Contextual learning strategies can be implemented without changing the curriculum. This strategy is developed so that learning is more productive and meaningful for the students (Anonymous, 2002). Five elements which become the core concept of the contextual learning are: (a) Activation of existing knowledge (b) Acquiring new knowledge by learning the whole, then the details; (c) Understanding of knowledge by active construction: (1) temporary concepts; (2) sharing with others to obtain a response and for the validation; (3) revising/developing the concept; (d) practicing the knowledge and experience; (e) reflecting on the development of knowledge (Zahorik, 1995)

By reviewing the description above, it can be assumed that the contextual strategy is effective strategy in Conservation Education course to shape conservation – minded behaviors.

According to Simon (1998), behavior includes choosing action both conscious / unconsciously and most behaviors have goals and are goal-oriented. The existence of goals leads to the integration in behavior patterns. Knowledge has a role in the formation of behavior which determines which consequences are inherent in alternative strategies. The task of knowledge is choosing the whole group of possible consequences that are related to the strategy. Through Simon's opinion, the conservation education course learning process has a role in forming conservation-minded behavior

Behavior is also interpreted as an individual act that is shown continuously and tends to be sustainable due to the situation / condition (Robins, 1988). Behavior is categorized into: (1) behavior arises for a reason; (2) behavior directed to the goal; (3) behavior can be observed and measured; (4) behavior that cannot be observed but is important in achieving goals; (5) motivated behavior (Gibson, 1991). Although it is agreed that there are unobservable behaviors, psychologists in their studies focus more on behaviors that can be observed and measured. The measurement can be performed in the process and results of activities. Behavior also means a person's real actions to adjust to the environment in the context of a certain personality and social atmosphere (Zimbardo, 1996). According to Burrhus (2000), behavior is the result of the interaction between stimuli and responses. All forms of behavior including habits, emotional thinking / reactions are formed from stimuli and responses. Measurable behavior means that

we can predict people's behavior if they can control the stimulus. Behaviors are specific that individual behavioral manifestation to something may vary, depending on the development of personality / mental factors in addition to the environmental influences.

From the description above, behavior this research is defined as someone's real action in their interaction with the environment.

According to Chiras (2001), environment is defined as all biotic/abiotic factors which influence living organisms and conserve the natural resources through improvement, efficiency, recycling and demand reduction. According to Odum (1971), conservation (environmental conservation) is viewed from facets of these following objectives: (1) to guarantee the quality of the environment in terms of its aesthetic and entertainment, and its products; (2) to guarantee the continuity of crops, animals and natural materials to create sustainable harvest cycle.

From the description of the environmental conservation, it can be concluded that environment conservation is the effort of conserving environment for its functions as conservatory area or cultivation area. This effort is required to maintain its functions as the buffer of life. Maintaining the function of the environment can be performed through the utilization of natural resources or environment efficiently, retaining the elements of the environment, protect and rehabilitate damaged environmental elements to guarantee its aesthetic and entertainment, and its products for the continuity of crops, animals and natural materials to create sustainable harvest cycle through improvement, efficiency, recycling and demand reduction.

From the description in above, the synthesis of conservation – minded behavior is the act of conserving the function of the environmental elements to maintain its function as a buffer of life through: (1) efficient use of natural resources; (2) maintain the integrity of environmental elements; (3) protect the diversity of environmental elements; (4) rehabilitate damaged environmental elements.

This study aims to determine: (1) the implementation of contextual learning strategy in Conservation Education course; (2) the learning outcomes of the implementation of the contextual strategy in Conservation Education course during the debriefing of internship program; (3) Conservation – minded behavior of internship program participants after the implementation of the contextual strategy in Conservation Education course; (4) The contribution to the results of the implementation of the contextual strategy in Conservation Education course on conservation – minded behaviors of internship program participants in SMK N 1 Bawen.

2. Research Methods

The population in this study was students of the Agricultural Mechanization Program in SMK N 1 Bawen. The sample in this study is the students of Agriculture Mechanization Program which participated in the Internship. In the year 2018, the participants in the internship program in Agricultural Mechanization Program SMK N 1 Bawen were 67 person consisting of 35 participants in industries around Semarang Regency, and 32 participants in industries outside / far from Semarang Regency. Therefore, 35 participants in industries around Semarang Regency were involved as subjects of this study and 30 participants in industries outside / far from Semarang Regency were the subjects of instrument testing.

The independent variable in this study was the result of the implementation of the contextual strategy in Conservation Education course at the internship debriefing in terms of the knowledge of pollution: air, water and waste management. The dependent variable was the conservation – minded behavior of the internship participants. The data on the conservation – minded behavior were collected using an observation sheet containing 25 questions / statements which were constructed by referring to the industrial environment management, appropriate tools, materials, and space utilization, maintenance of equipment, materials and space properly and rehabilitation of damaged equipment, materials and spaces. The validation of the observation sheet was based on the approval of the supervising teacher, instructor and evaluator of the Institute for Research and Community Services in UNNES.

The data on the learning outcomes on the Conservation Education at a the internship debriefing were collected using test (dichotomy) constructed with reference to the pollution phenomena: air, water, and waste management. 45 test items were then trialed on 30 internship participants outside the research subject for their validity and reliability. Validity of test items was calculated based on the validity index by biserial point correlation formula (Guilford, JP: 1954). Of the 45 test items, 12 items were invalid and 33 items were valid and still represented all the specified specification. Valid items were calculated for their reliability index with Kuder Richardson formula (KR 20). The reliability index was 0.84 (high enough). Valid and reliable test items were then used to collect data. The collected data were analyzed using descriptive analysis and regression. Regression analysis was performed after the normality test. The normality test showed that data were normally distributed.

Implementation of contextual strategy was conducted for the internship participants by providing additional materials on the subject of Conservation Education. The learning

process was conducted both in the classroom and the field / laboratory. The students were taken to the Semarang Environmental Service (DLH) to learn about: the ambiance of the air quality standard, emission quality standards (related to air pollution and conservation), standard quality of the waste water and wastewater management (Wastewater Management Installation) and Fecal Waste Management Installation (IPLT) (related to water pollution and conservation; (2) to the Jatibarang Final Disposal Site (TPA) to learn the manufacture of organic fertilizer and biogas installation with raw materials for organic waste (related to waste management).

3. Results and Discussion

3.1. Results

The contextual strategy was implemented in the learning process of Conservation Education during the internship debriefing. The learning process in addition to do in the classroom, students also brought to the field / laboratory: (1) Semarang Environmental Service (DLH) to learn about: the ambiance of the air quality standard, emission quality standards (related to air pollution and conservation), standard quality of the waste water and wastewater management (Wastewater Management Installation) and Fecal Waste Management Installation (IPLT) (related to water pollution and conservation; (2) to the Jatibarang Final Disposal Site (TPA) to learn the manufacture of organic fertilizer and biogas installation with raw materials for organic waste (related to waste management).

The descriptive analysis found that: (1) the conservation – minded behavior had a score of 56 to 73, the mean score = 65, 34; standard deviation score = 4.63; median score = 65.5 and mode score = 65.5. Because the median score, mean score, and mode score were almost the same, the mean score was used as a measure of central tendency. This means that there are 50 percent of data that has a minimum score = 65, 34 and 50 percent has a maximum score = 65, 34. The number of the participants who gained the score of conservation – minded behavior above the mean score = 65, 34 was 18 people or 51.43 percent, which means that conservation-minded behavior of the internship participants is mostly high; (2) the learning outcomes of the Conservation Education at the internship briefing obtained a score of 13 to 30, the mean score = 20, 66, standard deviation = 5.018, median score = 20.50, and mode = 20.50. Because the median score, mean score and mode score are almost the same, the mean score is used as a central tendency measure. Therefore, 50 percent of data has a minimum score = 20, 66 and 50 percent having a maximum score = 20, 66. The number of the participants who gained

the score above the mean score of 20, 66 in the learning outcomes of Conservation Education is 18 students or 51.43 percent. Based on the results, the learning outcomes of Conservation Education on internship debriefing was mostly high.

Regression analysis of the distribution of learning outcomes with the contextual strategy in internship debriefing to the conservation – minded behavior can be seen on this following table:

TABLE 1: The Summary of The Regression Analysis.

Source of Variation	Db	JK	RJK	F _{hit}	F _{table}
Total	35	15 0147	15 0147		
Regression (a)	1	149439.11			
Regression (b / a)	1	694.95	694.95	1 772.83 *	
Residue (res)	33	1 2, 94	0, 392		4,14

* significant

Based on the table above, F_{stats} is greater than F_{table} or $1\,772.83 > 4.14$. The value of the $t_{stats} = 40.6$ and $t_{table} = 2.04$ (with probability value = 0.05 and $df = 33$). The results of the calculation of the regression of variable Y over X shows that t_{stats} is greater than t_{table} ($40.6 > 2.04$). Therefore, variations in variable Y can be explained by variable X by 86.8 percent through the equation $Y = 46, 25 + 0.9 24 X$.

The analysis above showed that 51.43 percent of the students gained the learning outcomes of Conservation Education using the contextual strategy on internship debriefing greater than the mean score, which means they have a high environmental knowledge. 51.43 percent of the students achieved conservation – minded behavior score greater than the mean score, which means they have high conservation insight. There is 86.8 percent contribution of learning outcomes of the Conservation Education with the contextual strategy at internship debriefing on the conservation – minded behavior of the internship participants.

3.2. Discussion

The Conservation Education with the contextual strategy conducted at internship debriefing was intended not to change the existing curriculum, but still achieved the learning objectives. This refers to the concept of contextual strategy which states that contextual strategies can be conducted without changing the curriculum. This strategy was developed so that learning is more productive and meaningful for students (Anonim, 2002). In contextual learning classes, the teacher’s task helps students to achieve

learning goals. Teachers deal more with learning strategies than provide information. The teacher's task is to manage the class as a team that works together to discover knowledge and or the skills from the process of discovery.

The learning process in addition to do in the classroom, students are also taken to the field / laboratory: (1) Semarang Environmental Service (DLH) to learn about: the ambiance of the air quality standard, emission quality standards (related to air pollution and conservation), standard quality of the waste water and wastewater management (Wastewater Management Installation) and Fecal Waste Management Installation (IPLT) (related to water pollution and conservation; (2) to the Jatibarang Final Disposal Site (TPA) to learn the manufacture of organic fertilizer and biogas installation with raw materials for organic waste (related to waste management).

Field trip learning is in line with the concept of contextual strategy because the illustration of the learning concept are linked to everyday real life. On the other hand, The Conservation Education with the contextual strategy conducted at internship debriefing is corroborated by the Squires et al (2003) which states that bringing students outside the classroom (field / laboratory) means that students can observe objects in their natural state and experience the phenomena that occur directly. This makes students actively involved in learning activities, and this involvement strongly supports the effectiveness of learning

Learning outside the classroom (field / laboratory) does not need too many lectures to explain an object, because what is directly faced is a real object. Learning media in real form creates greater motivation for students to learn. The students can be more easily remember what they learned when they see / experience it directly, compared to only receive verbal explanations without seeing the real object (Heinich et al., 1999). Therefore, it is far more useful for students to observe / experience making compost from organic waste outside the classroom, observing / experiencing CO level detection in emissions analysis equipment, and observing / experiencing detecting water pollutants in the Semarang Environmental Service laboratory rather than hearing lengthy explanation from the teacher verbally in the classroom.

This was corroborated by Arturo (1997) that the learning process of conservation environment should be done by observing the original state, the dimensions of plants, animals and the like. Real life experiences are very valuable for students because they have hidden power that is very suitable for students. The diversity of circumstances outside the classroom can be used effectively to develop environmental knowledge and concepts for these students. This is evidenced by the high learning outcomes of the Conservation Education on internship program debriefing using contextual strategy,

which include observing /practicing air ambience test, emissions test, making compost and biogas from organic waste and wastewater testing and wastewater and waste treatment plant in the laboratory

The learning process of Conservation Education during the internship program debriefing using contextual strategy was followed up by a discussion led or facilitated by the teacher. This means that learning is student-centered. Student-centered learning assumes that students play an active role and have unlimited potential to be developed. In it, the construction of knowledge is carried out together, and learning is achieved through involvement in various activities. Kilic (2010) revealed that through student – centered learning leads to the formation of creative thinking, reflective and critical thinking skills. Student-centered learning also provides benefits such as the involvement of students to be active in learning, encouraging students to become more autonomous in learning (Berdrow & Evers, 2010).

There is a contribution of learning outcomes of Conservation Education using contextual strategy during the internship program debriefing by 86.8 per cent to the conservation – minded behavior of internship participants. This shows that Conservation Education using contextual strategy during the internship program debriefing supports the formation of the conservation – minded behavior of the internship program participant. Conservation Education using contextual strategy during the internship program debriefing effectively supports the formation of the conservation – minded behavior of the students in SMK N1 Bawen. These findings are in line with Simon's (2002) statement that knowledge has a role in the formation of behavior. This role is to determine which consequences are inherent in alternative strategies. The task of the knowledge is choosing the entire group of the possible consequences associated with alternative strategies. Simon opinion shows that learning outcomes of Conservation Education using contextual strategy during the internship program debriefing contributes to conservation – minded behavior of the internship participants.

The high learning outcomes of the Conservation Education using contextual strategy during the internship program debriefing creates implication that the intensity of conservation – minded behavior of the internship program participants is also high. This occurs because the Conservation Education using contextual strategy during the internship program debriefing allows the students to directly observe / practice detecting air, water pollution, managing waste (making compost, biogas from organic waste). Because of those activities, the students are easier to remember what is learned which results in high learning outcomes.

The students are also touched by their hearts, so that caring for the environment is manifested in the form of conservation-minded behavior consisting of the industrial environment management, appropriate tools, materials, and space utilization, maintenance of equipment, materials and space properly and rehabilitation of damaged equipment, materials and spaces. As a result, the high level of conservation – minded behavior.

4. Conclusion

The learning process of the Conservation Education using the contextual strategy was performed on internship program debriefing. The learning process was conducted inside and outside the classroom, with learning outcomes that are mostly high. The conservation – minded behavior of the internship program participants is mostly high. The learning process of the Conservation Education using the contextual strategy performed on internship program debriefing contributed 86.8 % to the conservation - minded behavior of the internship program participants in the Agricultural Mechanization Program in SMK N 1 Bawen.

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