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The effect of outdoor learning model on improving cognitive ability in entrepreneurial learning at the field of electricity

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ABSTRACT

Outdoor learning model of learning is one alternative to reduce the level of saturation in learning, especially learning the practice in vocational high schools. Outdoor learning models can connect students to deal directly with the world of entrepreneurship so that teachers can teach entrepreneurial values easily. Outdoor learning can link the theories in the book and the reality in the field. The experience gained from the learning process outdoor learning has a lot of influence on student learning outcomes because it can hear, observe and feel direct events that occur in the real world. This study aimed to determine the quality of entrepreneurial learning outcomes and their effectiveness by using an outdoor learning model for electricity power expertise students in vocational high school. The study was conducted using a quasi-experimental approach with methods of pretest-posttest control group design. The population of this research was the eleventh-grade students majoring in electrical power installation engineering at SMK Negeri 2 Medan, Indonesia. The sample of this study were 76 students chosen randomly. The instrument used in this study was a multiple-choice test. The instrument that was used in this research, previously validated by experts of theory and material. The analysis was performed with the t-test and Gain N-score. This research found that students who learn to use outdoor learning model was better than students who learn to use conventional model.

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1. INTRODUCTION

Vocational education aims to produce graduates in character and ready to work. Vocational high school plays an important role in producing graduates ready to work in various fields according to the needs of business and industry [1]. Electricity is one of the field programs in vocational skills where graduates produced are desperately needed in the world of work. However, the facts show that there are many vocational graduates who have not been absorbed by the world of work. Some vocational school graduates still do not have the competence as expected in the world of work [2]. Vocational high school graduates' student competency skills assessed to be less, it could lead to many vocational graduates still unemployed [3].

Vocational high school graduates are one of the most graduates who have not been absorbed by the world of work [4]. In February 2018 it is known that the open unemployment rate at all educational levels attained at 6, 87 million people. The number of unemployed graduates of vocational schools ranks second highest compared to other educational levels, which reached 1, 42 million people. The high unemployment

rate of vocational high school graduates is an empirical fact that the purpose of conducting vocational education is not yet optimal. The above data indicate that efforts need to be implemented to lower the unemployment rate increasing at the vocational school graduates.

Unemployment can be reduced and solved in a way to become an entrepreneur [5]. The emergence of young entrepreneurs can reduce the economic gap [6]. One of the requirements to be a developed country is that it requires 2% of entrepreneurs from the total population. Therefore, education should be directed and supported to not only look for work (job seeker), but be prepared to form their own jobs (job maker) [7]. In this case, the vocational school graduates have to change the mindset to not become the workers of the company but to create employment opportunities.

Awareness in shaping the culture of entrepreneurs according competence can be acquired during schooling. The process of entrepreneurial learning in schools contributed the most in improving the knowledge and competence of students in entrepreneurship [8]. Learning-oriented entrepreneurship also has a positive influence on growing interest in entrepreneurship [9]. In this case the learning process in schools is a component that affects the increased competence of students in entrepreneurship.

Vocational curriculum for entrepreneurial learning has been given by the school through the subject matter Creative Products and Entrepreneurship (PKK). These subjects were new subjects and compulsory for vocational students for all grade levels. Based on interviews with PKK teachers at SMK Negeri 2 Medan in March 2019, it was discovered that the lack of teacher preparedness in facing PKK was due to sudden curriculum renewal. Teachers still use of conventional model or direct learning by lecture and demonstration. The learning process was still centered on the teacher. This method makes students more passive when the teacher gives time to ask. When viewed from the value of the Minimum completeness criteria (KKM) students in grade 2 program installation of electric power engineering (TITL) on the subjects of the PKK are still many who have not yet reached complete learn a minimum of 70 (school provision). The average value of students 2 TITL they reach 64. Based on these facts a lecture and demonstration one factor that makes students less active when the following study so that the average value obtained do not meet the KKM.

Entrepreneurial learning difficulties lie in the gaps between the understanding of the concept and application of existing concepts, giving rise to the assumption difficult to learn and develop. Entrepreneurial learning is no longer a process of transfer of knowledge from teacher to students, but it should be an effort to improve the overall educational skills through lessons PKK. Much can be done by a teacher in delivering the subject matter to be helped students understand the material, such as by using appropriate learning methods. Application of appropriate learning strategies are fundamental to achieve maximum learning results [10]. In this case the process of learning entrepreneurship in vocational high schools needs to be done innovation.

Outdoor learning model of learning is one alternative to reduce the level of saturation in learning, especially learning the practice in vocational high schools [11]. Outdoor learning models can connect students to deal directly with the world of entrepreneurship so that teachers can teach entrepreneurial values easily. Outdoor learning can link the theories in the book and the reality in the field. The learning also provides challenges to students in increasing learning achievement and building better social skills and personal skills. The experience gained from the learning process outside the classroom has a lot of influence on student learning outcomes because it can hear, observe and feel direct events that occur in the real world [12]. The learning process outside the room is confronted with actual natural circumstances and increases student activity because the approach can be done by means of observing, asking questions or interviewing, showing, proving, testing and other facts [13]. Outdoor learning will produce a learning experience for discipline in certain sciences and is equipped by involving simulations provided by academic learning [14]. Integrating learning and experiences outside the classroom through playing in the field directly or adventure, providing relevance and depth in the learning process [15].

Learning outside of class Often remembered lifetime [15]. Integrate learning and experience outside of the room, through playing on the field or far true adventure, give relevant and curriculum depth with the hard way to reach while inside the room. Outdoor learning can be fun, creative, challenging, and full of adventure, Also help students learn through experience and grow as individual confidence with responsibility, along with the exploit local wisdom in the future. Learning unwelcome and unpleasant make students feel less stress and enjoy learning followed and cause learning results obtained also decreased [16]. Through outdoor learning students can construct meaning (input), then the process through cognitive structures so impressive long in the memory (the case of reconstruction). Direct observation activities can enhance knowledge retention when compared to just hear [17]. People will remember 50% of what is heard and seen, but people will remember 90% of what has been done as a task or perform investigations [18]. Based on some of the above opinion concluded that the Outdoor Learning can help students master the understanding of the concept on entrepreneurial learning so as to improve knowledge in entrepreneurship.

Outdoor learning aims to enable students to adapt to the environment and natural surroundings and knowing the importance of life skills and life experience in environment and natural surroundings, and have

an appreciation for the environment and natural surroundings [19]. In his research, he explained: A new definition of outdoor education founded upon six major points is presented. Outdoor education: (a) is a method for learning; (b) is experiential; (c) takes place primarily in the outdoors; (d) requires the use of all senses and domains; (e) is based upon interdisciplinary curriculum matter; and (f) is a matter of relationships involving people and natural resources. Adventure education relates to interpersonal and intrapersonal relationships. Environmental education concentrates on ecosystemic and ekistic relationships. The author maintains that both approaches, properly integrated, Achieve objectives for all four relationships and in the process create a truly functional outdoor education experience. There are six goals by the students of the learning process Outdoor Leadership School [20], namely: (a) skills; (b) communications: (c) leadership; (d) smallgroup behavior; (e) environmental awareness; (f) the judgment in the outdoors; and (g) of outdoor skills. The environment outside of school can be used as a learning resource for entrepreneurial learning material so students learning in class can be found directly in the field. Learning to use outdoor models makes students actively learn so that learning becomes meaningful and mastery of concepts or cognitive learning outcomes can be empowered.

The outdoor learning model has advantages such as that students can learn in pleasant conditions and can interact directly with the surrounding environment so that learning will be more meaningful [21]. Outdoor learning also allows students to develop positive attitudes towards learning entrepreneurship through pleasant experiences [22]. Learning activities outside the classroom have five main concepts [23], namely: (a) the concept of the learning process, through this concept students can combine theory with the real world (b) the concept of activity outside the classroom, this concept provides an opportunity to students mastering the skills, attitudes, and appreciation of various things that exist in nature, (c) the concept of the environment, this concept makes students more respect for the environment and make good use of the environment, (d) the concept of experimentation, this concept proves the theory learned from books and applying it to the real world, and (e) the concept of kinship, this concept strengthens the relationship between teacher and student.

The outdoor learning model besides having advantages also has weaknesses. The only weakness of the outdoor learning model is that teachers bother managing / managing learning when in the field, requiring travel costs and teachers are less able to supervise students in conducting field surveys [24]. Overcoming the problem of travel costs can be overcome by selecting objects that are close to school Conducting field studies to run successfully needs to be planned, implemented, and ended well [25]. Teachers do careful planning (briefings, tools, schedules, interview guidelines) to overcome the difficulties of organizing or managing learning while in the field.

Outdoor learning contributes significantly in the development of cognitive, affective, social and psychomotor aspects [26]. The contribution of external learning in the cognitive aspect is represented through mastery of student learning because the integration of theory and practice in the learning process [27], in addition, outdoor learning has encouraged activities students, creativity, imagination and cooperative skills in improving their learning achievement, the integration of facts, fiction and a pleasant learning environment has created a constructive atmosphere of teaching and learning [28]. The role of the teacher when participating in learning using outdoor learning is to build student confidence to engage in learning and develop the skills possessed by students. The teacher also acts as a facilitator and mentor in determining and controlling discussions within the framework of intellectual openness and equality [29]. Implementation of outdoor learning models in learning requires teachers to be able to change students' perceptions about the surrounding environment [30]. Therefore, active teacher participation is needed in providing guidance and evaluating student difficulties when there is a problem solving process that has not been completed.

Implementation of entrepreneurial learning using models Outdoor Learning must be prepared carefully with attention to every procedure or steps for the purpose of learning can be achieved. The steps of learning to use the model of Outdoor Learning [30], namely: (a) observing; (b) classifying, (c) measuring, (d) communicating, (e) infering. In more detail the steps of Outdoor Learning learning model adapted from [30, 31] can be explained as follows:

a. Introduction: Master opened a lesson with a greeting, prayer and briefly describe the activities to becarried out;
b. Grouping: Teachers group students into several groups. One group consisted of 5 to 6 students;
c. Leading out of the classroom: teacher make students out of the classroom and gathered by the group and each member of the group checked in detail;
d. Giving the essential question: Teacher provide essential discussion about the relationship between theory and the surrounding environment;
e. Working in small groups: Students work in small groups to discuss accordance with job sheet of teachers;
f. Presenting the results: Each group presented the results of discussions in front of friends and teachers;

g. Evaluating simulation results: Teacher evaluate simulation results of students (by looking at the advantages and disadvantages) to improve the learning activities.

The implementation of the outdoor learning model in this study was carried out through community service activities. Students become challenged to solve real problems in the field through project activities [32]. Project activities make students interested in doing activities in the field to collect research data through observation activities. Activities undertaken by students were finding electrical equipment that has been damaged in people's homes. Next students repair the damaged equipment with the ability or skills they have. Through these activities, students can find a variety problems regarding damage to electrical appliances that have not yet been discovered while doing practice in schools. This outdoor learning activity aims to make students able to interact with the surrounding environment and know the importance of life skills and experience and build abilities as a reliable entrepreneur in providing services. From this activity students are able and more responsive to provide several solutions to solve problems based on the facts they encounter in the field [24, 32, 33]. In addition, the use of outdoor learning models can provide students with an understanding of the concept of entrepreneurship through the activities of trying and exploring because it was a discovery through the real world.

Based on the problems above, it can be concluded that in entrepreneurship learning a learning model is needed to help students achieve their learning goals especially understanding concepts (cognitive aspects). The use of outdoor learning models in cognitive aspects can be found when students observe, measure and ask questions about the observed object can apply the knowledge they have to interpret their observations. This will increase student mastery of the material being studied. Students are required to be directly involved rather than just listening to the teacher's explanation but by investigating, observing and searching and checking facts or truth objectively. Outdoor learning can be done at any time according to the program designed by the teacher. Therefore, this study aims to find out more about the effectiveness of the application of the outdoor learning model to improve the cognitive abilities of students in the electricity field in learning in vocational high school.

2. RESEARCH METHOD

2.1. Research design

The study was conducted using a quasi-experimental approach with the pre-test and post-test control group design methods [34]. This study aims to determine the quality of learning outcomes and effectiveness using outdoor learning models in terms of cognitive domains, this study has both dependent and independent variables [35]. Outdoor Learning Models and conventional models are independent variables while learning outcomes cognitive domain was the dependent variable.

2.2. Population and sample

The population of this research was the eleventh-grade students majoring in electrical installation engineering at SMK Negeri 2 Medan, Indonesia. The sample of this study were 76 students who were selected randomly [36]. This study uses two classes, namely class XI $TITL_1$ as an experimental class (38 students) and class XI $TITL_2$ as a control (38 students). The group selection is done by looking at the equality value of the previous report. Both classes get different treatments where the experimental class is treated with an outdoor learning model while the control class gets a conventional learning model. Creative and entrepreneurial product lessons have 7 hours of learning in a week and all students follow the teaching and learning process of product/service product assembly methods.

2.3. Research instrument

The research instrument was a tool to measure the variables used in research [37]. The instrument used in this study was a multiple-choice test of 40 items. The instruments in this study were developed by researchers and have been validated by theorists from Yogyakarta State University, Indonesia. Then a rational experiment is conducted to measure the validity and reliability of the instrument. Validation and reliability test results show that: (a) there were 22 valid items out of 40 items. Invalid items were not used because they do not meet the requirements, which were based on different correlation coefficients, difficulty levels, and strengths; (b) The reliability of the questions is 0.72 (high category) so the test was declared reliable.

2.4. Data analysis

Data analysis technique is done with the following steps: (1) For the initial analysis testing requirements that normality test methods Shapiro-Wilk for homogeneity test conducted by test levene test, and (2) a subsequent analysis of hypothesis testing in this study is hypothesis 1 using independent samples t-

test and hypothesis 2 using Ngain score. Pretest group normality test results for experimental class control class is 0.088 and 0.070 while the posttest for the experimental class control class is 0.129 and 0.069. Output learning outcomes of the two groups (pretest-posttest) for each class have significant value > 0.05 then it can be concluded that the data is distributednormally, Furthermore, to homogeneity, note that the data pretest between classes at 0.736 while data between classes posttest at 0.537. Output learning outcomes of the two groups (pretest-posttest) have significant value> 0.05, it can be concluded that both groups have the same variance or homogeneous. Based on that data known to the testing requirements or basic assumptions qualify so it can continue to wear parametric statistical hypothesis testing.

3. RESULTS AND DISCUSSION

3.1. Quality of entrepreneurship learning output with outdoor learning model

The hypothesis in this study was that there are differences in the improvement of entrepreneurial cognitive abilities between classes using outdoor learning (experimental) models and classes using conventional models (control) reviewed through the mean value and independent sample t-test. Increased cognitive abilities in entrepreneurship based on the mean value of the control group pretest output value is higher than the experimental group that is 52.63> 50.00, while the output results of the posttest mean value of the experimental group is higher than the control group that is 78.11> 74 , 76. Judging from these data it was known that there are differences in student learning outcomes before and after treatment was given. When viewed from the KKM criteria, the pretest mean value of each group is known to not meet the KKM value of <75. While the posttest mean score for the experimental group is known above the KKM value of 78.11> 75 and for the control group it was known that it still does not meet the KKM value of 74.76 <75. From the learning outcomes of both groups it can be seen that the class using the outdoor learning model higher than the class that uses conventional model.

Furthermore, the increase in entrepreneurial cognitive abilities was evaluated from the independent sample t-test. The first test was conducted on student pretest data to determine the ability or initial knowledge of students between classes. Based on the output of the independent sample t-test on the pretest between classes, it was known that the sig (2-tailed) value is 1.26 <0.05, then H_0 was accepted. The conclusion from the data was that there is no significant difference in the pretest scores between the experimental group and the control group that mean the ability between classes was equal before treatment. The second test was conducted on students' post-test data to determine the ability or knowledge of final students between classes. Based on the output of the independent sample t-test at the posttest between classes, the sig (2-tailed) value of 0.04 <0.05 shows that H_0 was rejected. The conclusion from the data was that there was a significant difference in the posttest scores between the experimental group and the control group, meaning that the abilities between the experimental and control groups differ after the treatment. So, it can be seen that the outdoor learning model was influential to improve students' cognitive abilities.

The results showed that students who used the outdoor learning model through theoretical and empirical studies were better than students who were taught using conventional models. Outdoor learning builds knowledge and meaning through reviewing their material self-activity or with others [38]. What they learn in school needs to be integrated with the real world, such as asking students to reflect on their experiences at school and link their task or project reviews. The results of this study are also supported by previous research that the study of outdoor methods succeeded in increasing students' interest in entrepreneurship subjects [39]. Outdoor study method makes students more enthusiastic in learning, concentrates more on the material, makes students think more advanced, learning atmosphere is more comfortable, students are better able to understand the subject matter, students are more willing to express their opinions and make students more active. The outdoor learning model has succeeded in increasing student learning knowledge [40]. Through knowledge sharing (group activities) students are more motivated to expand their knowledge [41]. Knowledge sharing activities can increase students' active participation in learning and improve learning outcomes in the cognitive domain (understanding, conceptual organization, and reflection). This is also supported by the results of research from Anwari that the implementation of outdoor learning can improve student cognitive learning outcomes and the target of cognitive learning outcomes has been achieved [42]. Subsequent relevant research stated that learning outcomes using outdoor learning models were higher than using conventional models [43]. Subsequent relevant research also states that classes that use learning models outside the classroom are better than classes that do not use learning outside the classroom [44].

Then the test results using the independent sample t-test found that there are significant differences between student learning outcomes using outdoor learning models with learning outcomes that use conventional. The significant difference in learning outcomes between those using outdoor learning and conventional models is influenced by several factors. One of the factors that influence the application of

outdoor learning models is better because learning requires students to learn independently and not only listen but also observe, ask or interview, demonstrate, prove, test facts and others [45]. Furthermore, outdoor learning is more real for students because it can be practiced directly so that it is easier to digest the material taught by the teacher. This was in accordance with the opinion Hamzah of which states that learning that uses the environment makes it easy for students to digest the material because the material is presented in concrete rather than abstract form [46]. This is also supported by O'brien [38] who states that learning outside the classroom builds understanding of the material provided through the activities they do and can integrate between what is learned at school with the real world. Furthermore, the atmosphere of student learning also becomes different, when in the classroom students are confined to a room while when studying outside the room will make learning feel fun and real. From some of the opinions above, that learning by using outdoor learning models in this case can increase learning activities that affect the improvement of student learning outcomes.

3.2. Effectiveness of learning output in entrepreneurship with outdoor learning

The effectiveness of an outdoor learning model can be determined through calculation with N-gain score. The N-gain test calculation was obtained from the difference between the post-test and pre-test values for each class, after that the division of percent form categories refers to the source of Hake, RR, 1999. The results of the N-gain-percent calculation to apply the outdoor learning model are 56.16 or 56.2%. This means that the outdoor model was categorized as "quite effective" learning. While the results of the calculation of N-gain percent to apply the conventional model of 45.06 or 45.1%. This means that the conventional model was categorized as "less effective". Based on the results, the percentage shows that the class using the outdoor learning model was better than the class using the conventional model.

A conducive learning environment is very important to improve student concentration and focus on the learning process [47]. Physical and mental emotional involvement to encourage the willingness, ability, high nature curious, as well as a driver for improving the quality and success of learning [48]. In this study, teacher skills and teaching styles are intended to be important. Furthermore, learning satisfaction is obtained from a relaxed and pleasant learning environment. All that can be achieved from learning outside the classroom. The study concluded that almost all respondents seemed happy to adapt to their environment. The results of subsequent studies state that the effectiveness of outdoor learning based on character values on learning outcomes is effective for improving students' integrated thematic learning outcomes [49]. Furthermore, subsequent relevant research states that outdoor learning environments contain the character of this problem effectively to instil environmental awareness in student characters and effectively to improve student learning outcomes [50]. The results of the study [50] also showed that the model of outdoor learning was learning that has very positive benefits. In the delivery of material can be uniform, the learning process becomes clearer and more interesting and the learning process becomes more interactive in improving the quality of student learning outcomes. Outdoor learning can also be used as an alternative to reduce the level of boredom in learning, especially practical learning in vocational high school [51]. Learning using the outdoor learning model also directs students to learn actively and in groups. These results were supported by previous research which states that learning done together will show more effective learning outcomes than individual learning or lecture methods [52, 53]. In this case, it was concluded that the outdoor learning model is effective in improving the cognitive abilities of students in the electrical power expertise at vocational high school.

4. CONCLUSION

This study determined the quality of entrepreneurial learning outcomes and their effectiveness by using an outdoor learning model for electricity power expertise students in vocational high school. Outdoor learning models can significantly improve student learning outcomes in cognitive aspects of entrepreneurial learning. Learning model was quite effective outdoor learning for entrepreneurial learning in the electrical power expertise at vocational high school. Outdoor learning model successfully improve the quality of entrepreneurial learning as students become more enthusiastic about learning, more concentrated on the material, making the students think more developed as well as students become more active.

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