Developing Courage in Taking Risks through Science Learning Worksheets Integrated to Entrepreneurship

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Abstract. Dare to take risks is an individual's attitude in deciding the direction of action and behavior. Generally, a risk-taking attitude is developed through entrepreneurial activities that encourage someone to become courageous in making decisions. This research is important because the science worksheets that are integrated with entrepreneurship have not been developed properly by experts. Teachers need worksheets that are effective and contextual. This study aims to examine the effectiveness of the entrepreneurship-integrated science worksheet on students' risk-taking courage. The entrepreneurial-integrated science student worksheet used in this study was developed in previous studies, consisting of four stages: problem analysis, product creation, product SWOT identification, and product marketing plans. A quasi-experimental pretest-posttest non-equivalent control group design was used in this study. The number of samples was 140 students of junior high school in grade VII divided into the experimental and control groups. Data analysis was carried out through a t-test at a significance level of 0.05. Based on the post-test, the students' courage to take a stand showed that the average value of the experimental class was higher than the control class. The results of the t-test obtained a p-value $0.000 < 0.05$. The research results indicate that the science worksheets containing entrepreneurial values develop risk-taking attitudes effectively for junior high school students. The Students Activity Sheet needs to be applied by science teachers for junior high school to have a mature and tough attitude in deciding and problem-solving in everyday life.

Keywords: Student Worksheet · Courage in Taking the Risk · Science Learning · Entrepreneurship

1 Introduction

Taking a risk means the attitude in taking or determining a decision. Decision-making contributes crucially in determining the individual's or group's demeanor and behavior within the organization. Decision-making can be taken as the parameter of leadership

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[1]. Decision-making is absolutely necessary for a plan to work out perfectly. Likewise, in terms of the learning-teaching process, a courageous demeanor in taking risks on adolescents influences students' learning achievements [2].

Courage is taking risk character is rarely become a teacher's attention learning process. Referring to the previous research, courage in taking risk character is essential to be developed by a teacher to students because it connected directly to the attitude in deciding an action.

The aspects of measuring students' courage in taking risks are (a) subjective norms related to other people's standard view on an object or phenomenon. The observable characteristic includes agreeing or disagreeing on a social view or perspective, (b) searching for information (risk perception) related to everything about to do. The observable characteristic is to strive to look for information and knowledge on the action they want to do, (c) think about the benefits and impacts (perceived benefit and consequences), related to consideration on the benefit and consequences of action about to do. The observable characteristic has vision and estimation on something that will occur in the future, (d) acceptance demeanor (risk attitude), related to how to respond to action about to do. This aspect is consisted of the attitude to accept responsibility, enjoy, passion, be honest, and committed, (e) action (risk behavior), it is related to what the individual will do as proof that the behavior is carried out consciously and has been taken into consideration [3–6].

Based on the recommendation of previous research that entrepreneurship needs to be a part of science education [7–9]. The recommendation conveys the importance of entrepreneurship values taught should be integrated with other subjects; still, it is inhibited by learning media such as Student Worksheet, which has not met the requirements.

Student worksheets are guidelines designed to facilitate student learning through experimentation. Learning using worksheets is beneficial for teachers and students, for example making it easier to manage classes, and being student centered. Worksheets can also make it easier for teachers to monitor student learning outcomes [6, 13].

The worksheets used in the classroom today do not provide motivation to learn [14]. The worksheets used in school contain many questions. Unfortunately, such worksheets do not develop aspects of students' skills. The impact is that students are less skilled in certain competencies. Teachers need worksheets that are specific to certain skills. Waste management skills are often taught theoretically. Students are able to explain well, but students are not able to do it.

The latest curriculum in Indonesia requires more project activities in the learning process [15]. Teachers need specific worksheets to support the learning process. The integration of entrepreneurship in worksheets is needed to design products that have selling value as entrepreneurs do business analysis. Therefore, testing the effectiveness of the entrepreneurship integrated science worksheet needs to be tested.

Science learning in junior high schools includes knowledge of Biology and Physical Sciences as well as multidisciplinary with other scientific fields to solve problems. In essence, science is built on scientific processes, scientific attitudes, and scientific products through a process of experimentation and in-depth analysis. Thus, activities that support students' understanding and skills through worksheets are needed [3, 14, 15].

Student worksheet must meet specific criteria, such as considering individual differences, learning activity stressing on the process, having variation of media and activities, and adjusting the learning experience with the requirement of student's character development [10]. The expected change in students' character is managing waste into valuable products. Waste issues have become common problems in daily life. Everyone in a home produces waste and dispose of those waste without going through the processing process.

In Natural Science learning, it is expected that the teacher can train students to process waste with an approach that is more interesting to students. Therefore, it is required entrepreneurial-integrated natural science student worksheet to help the teacher train students to be confident in processing waste and courageous in processing waste into valuable business products.

2 Methods

This research is a quasi-experimental research design with pre-test and post-test control group design. The treatment was carried out to two students, experimental and control groups. Students in the experiment group use Integrated entrepreneurship Student Worksheets, while the control group uses traditional worksheets. The quasi-experimental design is presented in the following Table 1.

The sample was 140 students of class VII in SMPN 21 Mataram that were randomly selected. All samples were divided into experiment groups with as many as 67 students, and the control group was 73 students. All of them were assumed with the same condition. Both groups were taught with the same lesson material, environmental pollution issue, but using different worksheet models.

Data collection was gathered before the class started, during the learning process, and after the class finished. The data comes from direct observation, questionnaire results, and also result of the Student Worksheet. Observation and Student Worksheet data were analyzed descriptively, while the questionnaire data were t-test analyses.

3 Results and Discussion

The topic applied for the experiment process is environmental pollution. The Student Worksheet was used to guide students in solving environmental pollution issues in the neighborhood. Students who study through entrepreneurial-integrated natural science student worksheets were trained to transform waste into a product worth selling.

Students must design their own product they want and like and analyze the product quality they made. Additionally, students analyze the marketing potential of such products.

Table 1. Quasi-Experimental Research Design

Group	Pre-test	Treatment	Post-test
Experiment	Risk-taking	Integrated entrepreneurship worksheets	Risk-taking
Control	Risk taking	Traditional worksheets	Risk taking

The specifications of the LKS IPA integrated entrepreneurship are (1) used to guide skills in processing waste on environmental pollution materials, (2) prioritizing skills in processing waste through reduce, reuse, and recycle, pollution activity models, (3) oriented to product development and carried out SWOT identification. SWOT identification is an activity to identify product strengths, product weaknesses, product marketing opportunities, and product marketing threats. The specification of this science worksheet is different from the general worksheet, especially in SWOT identification activities. This activity is not used to being carried out by students at the junior high school level, but it is very important to be trained so that students are accustomed to critical thinking and futuristic thinking to assess the prospects for product development in the future.

The components of the entrepreneurial-integrated natural science student worksheet consisted of (1) the purpose of the activity is to make crafting with economic value, conduct SWOT identification, and make a plan for product marketing. (2) discussion, to exchange ideas to design product they want to make and also to determine the working procedure of making the product, (3) SWOT identification, students conduct strength, weaknesses, opportunities, and threats identification to the product they made, (4) plotting on the marketing plan and identifying the problems and the solution plan they must do if the product is on the market.

The student carried out waste processing activities by employing 3R principles, reducing, reusing, and recycling. The Reduce principle is carried out by decreasing materials or goods that might add hard-to-decompose waste. The reuse principle is carried out by re-utilizing remainder materials for different functions, for instance, utilizing used bottles for creating handy craft products. The recycle principle is carried out by processing waste materials such as vegetable leftovers or rice leftovers as organic fertilizer.

Based on the questionnaire result of courage attitude in taking the risk on students in experiment class and control class, it is obtained t-test result as shown in Table 2.

Based on the average score of the experiment and control class above, it shows that before conducted treatment, the average score was the nearly same result, 55.37 on the experiment class and 54.41 on the control class. After conducting treatment, the average score in the experiment class is 66.40, while the control class is 61.59. The average score difference of the experiment and control class after the treatment was subsequently tested statistically to test the hypothesis.

The statistic test was implemented to test H0, stating that there is no influence in the treatment to utilize entrepreneurial-integrated natural science worksheet on the courage in taking the risk to the Junior High School students. Meanwhile, Ha states that there is an

Table 2. The average questionnaire score of experiment and control class

Group	Mean		Mean Difference
	Pre-test	Post-test	
Experiment	55.37	66.40	11.03
Control	54.41	61.59	7.18

influence in the treatment to utilize entrepreneurial-integrated natural science worksheet on the courage in taking the risk to the Junior High school students. The t-test result using SPSS Software version 20 conveys that the p-value is 0.000. If the p-value < 0.05, thus H0 is rejected, while Ha is accepted. This result shows that the p-value is $0.000 < 0.05$, which means H0 is rejected, while Ha is accepted or significant. In other words, there is an influence in the treatment to utilize entrepreneurial-integrated natural science worksheet on the courage in taking the risk to the Junior High school students.

Entrepreneurial-integrated natural science worksheet has strengths, i.e., simplifying students' understanding of environment lesson material, developing the ability to think critically in solving environmental pollution problems, providing freedom to students to design the products they want to make from used materials, training students to conduct SWOT identification, training student to plan marketing process as well as to predict of what might happen, and training student to utilize waste into entrepreneurial-valuable products.

One of the primary skills in entrepreneurship is making SWOT analyses. It is an activity they have to do before starting a venture. It needs the ability to recognize its own *strengths* and weaknesses and observe opportunities and threats that might appear in the future. Knowing the strength to be utilized to reach the opportunity, suppress the threats, and know their weaknesses to avoid threats. After identifying the fourth aspect, the following step is to develop a strategy in order for their effort to gain success.

The SWOT analysis becomes the foundation to start a business. However, in the entrepreneurial-integrated natural science student worksheet, the "SWOT analysis" is not literally used to adjust Junior High students' thinking ability, but it uses the "SWOT identification" term. Students are only expected to identify the strengths, weaknesses, opportunities, and threats of the products they make if they are going to market them.

The activity of strengths and weaknesses identification of a product is identical to reflective thinking, the ability to observe a process of an event to grasp the perspective of judgment [11]. Making an assessment is essential to be trained because it is part of the reflection process. The identification of *Opportunities* and Threats is similar to futuristically thinking; it is the skill to estimate the change and connects current realities with the upcoming realities which about to come [12]. The exercise in thinking about the opportunities and threats will help students think forward through analysis and prediction of events that might occur in the future.

SWOT identification is a follow-up activity after the product has been made. After students had made the product in the conventional learning models, the product was submitted to the teacher to be assessed. Entrepreneurial values are inserted through SWOT identification so that students can think reflective and futuristic on what has been done.

Strengths and Weaknesses identification activity is identical with the way to think reflective, the skill to observe an event to derive a perspective or judgment [11]. Opportunities and threats identification are similar to the futuristic thinking method, the ability to predict or estimate changes and connect current reality with the reality about to occur in the future [12]. The exercise in thinking regarding the opportunities and threats will help students think forward through analysis and prediction of possible events that will occur

in the future. These reasons stimulate students' behavior to be courageous to take risks to utilize and design organic and inorganic waste into entrepreneurial-valuable products.

4 Conclusion

Based on the research and data analysis, entrepreneurial-integrated natural science worksheets can develop courage in taking risks of Junior High students into valuable products. This Student Worksheet is not only lead student can process waste but also to lead students to think reflective and futuristic through SWOT identification so that the product made of waste can be sold. Worksheets are needed specifically for specific purposes. If the waste processing skills are continuously trained, students will get used to doing it wherever they are, not just when they are at school.

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