Implementation of Role Playing's Learning Model on the Agribusiness' Entrepreneurship Course Using Brainwave Technology

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ABSTRACT

Before learning occurs, the lecturer must do strategic planning and hopes that learning will achieve optimum goals by designing a role-playing approach based on SWOT analysis to build optimal learning achievement. This experimental study uses SWOT analysis with the role-playing paradigm of learning on the agribusiness' entrepreneurship course. The role-playing model phases include the group being inspired by the lecturer, choosing roles, planning observers, preparing role levels, playing, discussing and evaluating, re-playing, exploring and evaluating II, exchanging experiences, and drawing generalizations. The research objective was to determine 1) the effect of student activity and process skills on learning achievement, and 2) differences in student achievement to get a role in agribusiness' entrepreneurship learning model based on SWOT analysis with conventional learning. The findings of this study are the application of SWOT analysis to obtain (1) student activity and process skills on learning achievement, and (2) student activity and process skills in learning through role-playing learning models. Based on SWOT analysis, the agribusiness' entrepreneurship courses can jointly affect student achievement. Research objectives using a role-playing model based on SWOT analysis in agribusiness entrepreneurship courses are achieved optimally.

Keywords: entrepreneurs, agribusiness, brainwave, student achievement.

1. INTRODUCTION

The trend of still low quality of education in Indonesia, especially at the primary and secondary levels of education today, requires the concern of all parties in the context of efforts to improve the quality of learning outcomes of their students. This condition occurs partly because the educational management approach has tended to be more towards the education production function or input-output analysis. Educational institutions function as production centers, and the quality criteria are only seen from the aspects of the products they produce. The assumption of this approach is not an educational process but focuses on the quality of the product [1].

The conventional monotonous teaching method of teachers sometimes makes material opportunities a frightening specter for students. Thus, there need to be thoughts that can change the dogma of learning opportunities from the teaching paradigm to the fun learning paradigm [2]. Implementation of learning can be achieved optimal if educators can take advantage of existing education in schools and analyze it. They can understand the school's strengths, which is supported by a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis used as a basis for moving towards effective learning [3]. Therefore, the implementation of

education is strongly influenced by the behavior of educators and student behavior which is part of the SWOT.

SWOT is simple, easy to understand, and can also be used to formulate models. This practical learning model can take the form of conducting an internal survey of program strengths and weaknesses and externally on opportunities and threats that are simple, easy to understand, and can also be used in formulating models-model. The SWOT analysis is not aimed at school institutions, but the SWOT analysis aims to implement the ongoing learning for the material to be taught. One alternative learning model that can be developed to meet these demands is the role-playing learning model. According to [4], this model is used when the lesson is intended to: (a) explain an event which involves many people, and based on theoretical considerations, it is better to be dramatized than told because it will be more transparent and can be lived by students; (b) train student so that they can solve socio-psychological problems, and (c) train student so that they can socialize and provide possibilities for understanding other people and their problems.

Based on the above statement, it is necessary to research the application of role-playing learning models, seen from the activities of teachers in the teaching and learning process. Based on the outlined problem, the following research questions have been developed:

1. Do student activeness and process skills together on learning achievement based on SWOT analysis in agribusiness' entrepreneurship courses?

2. Is student achievement in the role-playing learning model based on SWOT analysis better than student achievement with conventional learning in agribusiness entrepreneurship courses?

2. LITERATURE REVIEW

2.1. Entrepreneurship

Entrepreneurship takes place in institutions of all levels and backgrounds, from domestic segments to multinational corporations. By putting together unique combinations of public and private capital to leverage economic, social, or cultural opportunities in an environment of change, entrepreneurship can be described as the process of generating value for business and social communities. Creativity has been viewed as building significant and relatively shaped features or ideas [5]. However, in an entrepreneurial sense, there should also be a subsequent link to innovation and profitability in monetary and social terms [6]. These ideas can be internally or externally located, although the entrepreneur will tend to search and identify potential solutions shaped in part by internal competencies [7]. Creativity allows the organization to take advantage of

opportunities due to changing environmental conditions [8].

2.2. Creativity: Behaviors, Attention, and Meditation

The word creativity has many interpretations. Sometimes it is used to describe a person's capability; sometimes, it is used to praise a work; and sometimes, it is used to describe daily behaviors [9]. While creativity has multiple meanings and definitions, two consistent elements are commonly recognized: novelty and effectiveness [9]. Dumasari et al. [10] argue that creativity can be seen as a process or a product that is both original and valuable.

Harryson [11] argues that the process of scientific discovery cannot be analyzed, and each discovery contains irrational elements or creative intuition. Downing et al. [12] argue that when looking from different perspectives, the process of scientific discovery and creation can be decomposed into specific behaviors, steps, and procedures.

2.3. Electroencephalography (EEG)

The brainwave is an electrical output rhythm change used by the cyclic pulsing of nerve cells and nerve fibers. An EEG responds primarily to the potential changes in the cerebral cortex. The double electrode placed on the scalp is used to record the possible changes in the cerebral cortex. The brainwave sensor is required complicated preparations in the past because the electrode needed to be fixed with glue on the participant's head. However, it is now possible to use simple devices to collect accurate brainwave data. The brain-computer interface can contain learners' brain waves and is commonly used to measure the brain's attention, anxiety, or relaxation values [13].

The NeuroSky Headset has been used to monitor and measure the attention and meditation of the learning process [14]. NeuroSky is a simple, lightweight, and inexpensive brainwave headset device. After the algorithm calculation, the brain's intensity of attention and meditation can be presented, ranging from 0 to 100.
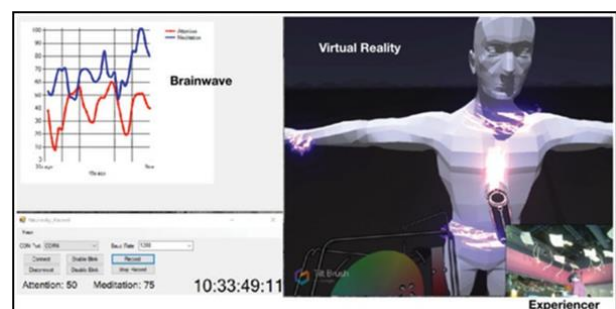

Figure 1 Brainwave information and virtual reality environment images (source: Dharmawan et al., 2021).

As shown in Figure 1, wearing the integrated system of VR and brainwave, participants can move or act comfortably and flexibly with few limits, while their brainwave information and VR environment images (shown in Figure 1) are recorded simultaneously the same computer program.

2.4. Self-evaluation with SWOT Analysis

SWOT analysis is a systematic way of analyzing threats and opportunities to distinguish future conditions to find existing problems. The SWOT analysis carried out is not only aimed at academic institutions, but the SWOT analysis is aimed at implementing the ongoing learning for the material to be taught. It means what strengths, weaknesses, opportunities, and challenges the academic institutions have to carry out learning.

SWOT analysis here is intended to explore the effectiveness and efficiency of learning, including the selection of a SWOT model, which is a technique that is simple, easy to understand, and can also be used in formulating strategies/models [15]. SWOT has no end, meaning that it will always change according to the demands of the times and needs so that SWOT can be used to initiate new innovative programs in education [16].

2.5. Linear Regression Analysis

Regression analysis is a method used to measure the effect of independent variables on the response variable [17]. The purpose of regression analysis is to estimate the average and the value of the response variable based on the value of the independent variable and test the hypothesis of the dependency characteristics. If the independent variable is more than one, the regression analysis is called multiple linear regression. Multiple linear regression happens due to the influence of several independent variables on the response variable [18]. The response variable is assumed to have a probability distribution, while the independent variable has fixed values. Linear regression has an equation called the regression equation. The regression equation expresses a linear relationship between the response variable given the symbol Y and independent variables given the symbol X [19].

2.6. Role-playing Model

Role-playing is a socio-drama approach that can be used to help learners understand facets of literature, social studies, and even certain aspects of mathematics or science more profoundly [20]. In addition, learning about the subject and integrating information into action, solving problems, exploring alternative topics will help them become more active and involved [21].

Role-playing effectively enhances initiative, communication, problem-solving, self-awareness, and team teamwork skills. Role-playing is all of the above, just learning from the truth, or most would be obsolete or trivial in some years to help these young people prepare for the Twenty-First Century challenges [22]. In simple terms, role-playing is an attempt to solve problems through demonstrations of action applied in learning mathematics [23]. The process is: a problem is identified, described, demonstrated, and then discussed. For this purpose, some students act as actors, while others work as observers [24].

2.7. Steps in the Role-playing Model

The data used in this study include primary data and secondary data. Primary data is collected and put together directly from the object under investigation for research purposes. Preliminary data came from respondents, such as answers to a list of questions given to the targeted students [25]. Questions are in the form of data relating to the variables to be studied, i.e., entrepreneurial knowledge, business scale, business experience, type of business, and use of accounting information. Secondary data is data collected by previous studies or published by various published studies or utilizing existing data. Secondary data used in this study were obtained from books or journals (see Table 1).

Table 1. Steps in the role-playing model.

Role-playing stages	Teacher's behavior
Step 1 Motivate the Group	1. Identify the problem 2. Describe the problem 3. Interpret the story, explore an event/problem 4. Describe the role to be played
Step 2 Choosing a Cast	1. Analyze roles 2. Select and assign actors
Step 3 Setting Up Observers	1. Deciding what to and should be observed 2. Describe the duties of the observer
Step 4 Prepare the stages of the role	1. Specifying the sequence of roles 2. Re-explain the roles to be played 3. Entering a problem situation
Step 5 Role	1. Initiate role playing 2. Continue the role 3. Stop acting
Step 6 Discussion and Evaluation	1. Assess the accuracy of the role 2. Discuss main focus 3. Develop a re-role
Step 7 Re-role	1. Play a role that needs to be improved 2. Suggest alternative behaviors that may arise from the re-role
Step 8 Discussion and Evaluation II	1. Assess the accuracy of the role 2. Discuss main focus 3. Develop a re-role
Step 9 Share experiences and draw generalizations	1. Relate entrepreneurial problem situations with real experiences 2. Explore general principles of behavior

2.8. Research Procedure

The experimental process is shown in Figure 2. Before starting the open-ended activity, each participant was asked to complete a copy of the K-DOCS. Each participant was then asked to complete an open-ended training by wearing an integrated set of brainwaves.

The research procedure is as follows:

1. The teacher explains the experiment procedure;

2. Brainwave will be administered and installed on the school computer;

3. Experiment, three meetings (2 hours/meeting) of entrepreneurial course, the students are asked to wear portable EEG technology during the regular class when the teacher is giving a lecture. (Note Teacher will be recorded during teaching class by using a video camera);

4. Examination/presentation (the teacher will prepare the assessment scale);

5. Role-playing model using SWOT analysis.

The result of the students' exam is compared to their level of attention and meditation and analyzed. Moreover, for further discussion, the teaching process, which is videotaped, can be analyzed and compared with the low level of attention and meditation (EEG result during class) and investigated its relation.
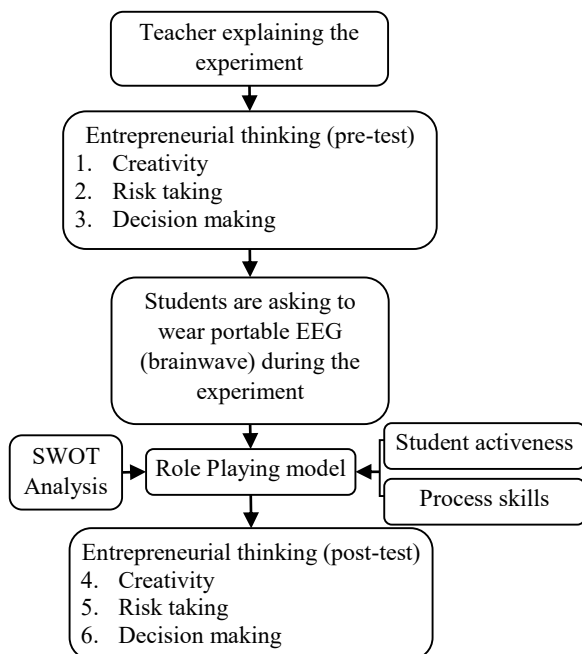

Figure 2. The design of the experiment.

The data obtained is observation data on student activity, process skills, and learning with a role-playing agribusiness' entrepreneurship learning model based on SWOT analysis. The student achievement data in the experimental class who received learning treatment with a role-playing entrepreneurial learning model based on SWOT analysis. At the same time, learning achievement from the control class received conventional learning treatment, namely a learning method using expository and deductive approaches. In this study, a pre-research activity was held, namely the SWOT analysis activity.

3. RESULTS AND DISCUSSION

The study's first research question sought to know the student's entrepreneurial skill development based on the entrepreneur score. The lesson designed for this study concluded with an assessment designed to assess the students' comprehension of the learning materials and their overall task performance. The lesson assessment was given at the end of the 5-meeting course. The students were presented with their business plan, and the assessment criteria consisted of three types of entrepreneurial skills: risk-taking, creativity, and risk-taking. The teacher assessed the students' presentation individually using a rubric designed by the researcher (Table 2). The summed scores of each lesson assessment at 100-point intervals were used to measure the academic performance variable in the statistical analysis.

Table 2. Assessment scale criteria

SCORE	RISK-TAKING	CREATIVITY	DECISION MAKING
A: 81-100	Very brave to take risks.	Very creative	Very appropriate decision making
B: 61-80	Brave to take risk	creative	appropriate decision making
C: 41-60	Full consideration in taking risks	Creative enough	Appropriate enough decision making
D: 21-40	Less consideration to take risk	Less creative	Less appropriate decision making
E: 1-20	No consideration to take risk	Not creative	Not appropriate decision making

Table 3 showed that students averagely achieved a good score (B) for all skills, risk-taking (68.9), creativity (65.4) and, decision-making (71.4).

Table 3. Descriptive analysis

Criteria	Mean	Std. Deviation
Risk-taking	68.9000	11.57993
Creativity	65.4500	11.65953
Decision making	71.0000	10.10471

Furthermore, Table 3 showed that the learning experience positively influences the development of their entrepreneurial skill.

The results of the SWOT analysis on the agribusiness' entrepreneurship course were.

a. Strengths

1) Agribusiness' entrepreneurship courses are related to other subjects that have been taught.

2) In terms of the aspects studied, entrepreneurship courses emphasize mastery of concepts and problem-solving skills.

3) Lecturers develop the syllabus according to the student's condition by paying attention to the technical instructions for producing the syllabus from the National Accreditation Body for University (BAN-PT).

4) Lecturers have the freedom to use and develop learning strategies.

5) It supports facilities that can be used in learning, i.e., comfortable learning rooms, computer laboratories, sound libraries, and other learning media tools.

6) Lecturers in agribusiness entrepreneurship courses mostly have entrepreneurship certification.

b. Weaknesses

1) Many activities do business projects in the learning process so that it takes up a lot of face-to-face time in class.

2) Achievement of learning completeness only reached about 78.5%.

3) Entrepreneurial material is very dense.

4) Student mastery of agribusiness' entrepreneurship material is highly dependent on previous material or prerequisites.

5) The learning methods used by lecturers have been less varied, so students tend to be less active in learning.

6) Agribusiness' entrepreneurship learning has not made much use of information technology.

c. Opportunities

1) Agribusiness' entrepreneurship course's learning by presenting events which are the main attraction for students.

2) There is the possibility of curriculum content to be developed so that competency standards are easily achieved.

3) The national accreditation body for university (BAN-PT) provides technical guidance on syllabus development.

4) The application of agribusiness' entrepreneurship courses is very relevant in everyday life, especially government policies to develop young entrepreneurs

5) The implication of implementing agribusiness' entrepreneurship courses that focus on student competence is that teachers are expected to explore students' potential to demonstrate knowledge and skills according to the standards set by integrating life skills.

d. Threats

1) Low ability/understanding of prerequisite materials have been received at previous levels of education.

2) Agribusiness' entrepreneurship course material can be applied independently.

3) The number of story questions from agribusiness' entrepreneurship course material makes students less understanding of the concept.

4) The finding of learning sources or information about learning materials is accessible via the internet.

Based on the combination of the SWOT elements, it is resulting in the following programs as listed in the SWOT matrix.

1) Achievement of competency standards

2) The material is packaged in the student worksheet

3) Independent learning activities

4) Group learning activities

5) Use of computer laboratories

6) Learning activities via the internet

7) The use of role-playing learning models

8) Small business project

Applying the SWOT analysis-based role-playing learning model can lead students to complete learning, namely completing student activeness, student process skills, and student learning achievement. The results showed the activeness variable obtained an average of 87.40; for the process skills variable, the average score was 85.88; and 78.55 for the learning achievement variable.

The active and process skills of students who are grown in learning with a role-playing learning model based on SWOT analysis in agribusiness entrepreneurship courses can jointly affect student achievement. The effect of student activities and process skills on student achievement taught using a role-playing learning model based on SWOT analysis in agribusiness'

entrepreneurship courses is jointly shown by the linear regression equation Y = -51.51 + 1.49X1 + 1.55X2. The magnitude of student activeness and process skills on learning achievement is known from the R square value of 81.4%, while other variables that affect learning achievement are 11.7%.

There is a significant difference between the learning achievement of class students taught by the SWOT analysis-based role-playing model and the student achievement through conventional learning. The SWOT analysis-based role-playing model has a higher average value of 78.31 compared to traditional education was only 58.25. There is an increase of 36.04%.

4. CONCLUSION

Based on the results described in the previous discussion, the following conclusions can be drawn as follows.

1. Applying the SWOT analysis-based role-playing learning model on the agribusiness' entrepreneurship course can lead students to complete learning, namely completing student activity, student process skills, and student learning achievement. The results showed the activeness variable obtained an average of 87.40; for the process skills variable, the average score was 85.88; and for the learning achievement variable, 78.55.

2. The activity and process skills of students who are grown in learning and a role-playing learning model based on SWOT analysis in agribusiness entrepreneurship courses can jointly affect student achievement. The effect of student activity and process skills on student achievement taught using a role-playing learning model based on SWOT analysis in agribusiness' entrepreneurship courses is jointly shown by the linear regression equation Y = -51.51 + 1.49X1 + 1.55X2. The magnitude of student activeness and process skills on learning achievement is known from the R square value of 81.4%, while other variables that affect learning achievement are 11.7%.

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