Experimentation on Bamboo Dancing Learning Model on Student’s Mathematics Learning Outcomes Viewed from Adversity Quotient (AQ)

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Abstract Students' mathematics learning learning models. Learning difficulties can be identified by looking at the Adversity Quotient of each student (AQ). Therefore the purpose of this study was to find out which (1) gave better learning outcomes between the models of bamboo dancing and direct learning, (2) which gave better learning outcomes between the students categorized as climbers, campers, or groups quitters, (3) In each learning model, which one produces better learning outcomes in each of the AQ categories and (4) In each AQ category, which one produces better learning outcomes, in each learning model. This type of research is pseudo-experimental. The population in this study is all eighth-grade students of SMP N 1 Sukoharjo with sampling techniques using clusters random sampling. Data analysis techniques using non-equivalent two-way variance analysis as the prerequisite test for normality test and data homogeneity test. The results of this study are (1) Bamboo dancing learning models provide better learning outcomes than direct learning models, (2) Students in the climbers category provide the same learning outcomes as students in the campers category, students in campers category provide better learning outcomes than students in the quitters category and students with categories campers provide the same learning outcomes as students in the quitters category. (3) For each learning model, it is consistent with the results of the AQ category, (4) for each AQ category; it is consistent with the results of the learning model.

1. Introduction
Mathematics as a ce that trains the students to problems. Most mathematics answered or responded to, but they also state that not all questions will be a problem [1]. Mathematics studies abstract ideas or concepts. It uses symbols so that concepts can be communicated. The symbols used cause students to be negative towards mathematics as subjects that are difficult to understand, boring, and less attractive to many students. In order for the concept of mathematics to be mastered by students optimally, the teacher should apply a variety of interesting learning models so that students get adequate learning experience and good learning outcomes [2].

The demands of the current 2013 Curriculum are that the teachers must do creative learning. Bamboo dancing is one type of cooperative learning method that can train student creativity. This is confirmed by Ajaja and Eraywokte stating that students who are taught using cooperative learning have higher learning outcomes than direct learning models. Cooperative learning is based on the theory of constructivism and refers to the principles of constructivism theory that knowledge is built by students themselves, both personal and social, prioritizing student activity, teachers only provide facilities and
Infrastructure [3]. Cooperative learning in class, students learn together in small groups of 4-6 people, students who are equal but heterogeneous, abilities, gender, ethnicity/race and each other help each other maximize learning to achieve common goals [4-5] and cooperative learning provides opportunities for students to work together in groups, with teacher instruction, students help each other group members with heterogeneous abilities [4,6].

The success of students in learning is influenced by internal, external and learning approaches. One part of the student's internal factors is Adversity Quotient (AQ). AQ is the intelligence or ability to change or process a difficulty into a challenge in solving a problem to achieve the achievement that you want to achieve [4,7]. AQ consists of five assessment indicators namely control, origin, ownership, reach and endurance [8-9]. Based on the AQ assessment indicator can be obtained by type AQ based on someone's behavior to change difficulties into a challenge and achievement. According to Stoltz, type AQ is divided into quitters, campers, and climbers. Quitters are someone who does not have the will to solve a problem, in this type someone has no interest in facing a challenge. Someone in the type of campers is someone who has the will to solve the problem, but when someone feels enough then he stops to solve the problem. Whereas in the type of climbers, someone will face a problem or challenge without giving up and continue to fight until they get a solution.

The purpose of this study was to find out (a) which one provides better learning outcomes between the models of bamboo dancing and direct learning, (b) which one provides better learning outcomes, students who are in the climbers, campers, or quitters categories, (c) In each learning model, which one produces better learning outcomes in each AQ category and (d) In each of the AQ categories, which one produces better learning outcomes, in each learning model. The novelty of this research is knowing better learning outcomes in each AQ category, both using bamboo dancing, and direct learning.

2. Research Methods
This study was a quasi-experimental study. The population in this study was all eighth-grade students of SMP Negeri 1 Sukoharjo consisting of 5 classes using stratified cluster random sampling. The variables in t variables. Dependent variables are students' mathematics learning outcomes and independent variables namely learning models and student AQ. The learning model applied is bamboo dancing learning model as an experimental class and a direct learning model as a control class. Data collection methods in this study using the test method, the questionnaire method, and documentation method. Data analysis techniques in this study using two-way ANOVA with cells is not the same as 2x3 research design with a prerequisite test using a normality test, homogeneity test, and balance test.

3. Research Result and Discussion
Based on the results of the calculation and analysis of the data on the data normality test using the liliefors test for the control class and experimental class, it was found that the sample came from a population that was normally distributed, then tested the data homogeneity using the Bartlet test. homogeneous. If the prerequisite test has been fulfilled, the research hypothesis can be tested using a ANOVA two ways with the cell not the same as the 2x3 research design. The following is the average of each cell and the marginal meanings shown in Table 1.

| Learning Model of | Adversity Quotient (AQ) | Average Marginal |
|-------------------|-------------------------|------------------|
|                   | Climbers | Campers | Quitters |          |
| Bamboo Dancing    | 84.583   | 75.769  | 72.500   | 77.857   |
| Direct            | 78.125   | 67.500  | 58.500   | 67.373   |
| Average Marginal  | 82.000   | 71.207  | 65.500   |          |

Here are the results of calculation with variance analysis with different cells

Table 2 Summary of the results of the calculation of two ways variance analysis with different cells
Based on Table 2 it was concluded that (a) the learning model influences students’ mathematics learning achievement, (b) Adversity Quotient (AQ) influences students’ mathematics learning achievement, (c) there is no interaction between learning models and AQ students. First conclusion (a) model has an effect on students’ mathematics learning outcomes, by looking at the marginal meanings it is concluded that the mathematics learning outcomes that are subjected to learning models bamboo dancing are better than direct learning models. This is consistent with the theoretical study that the model of bamboo dancing learning in the learning process involves students actively, exchanging information and discussing in predetermined groups so that each student is motivated to learn, very different from the learning model directly on this learning students only receive material, discussion and work on assignments given by the teacher [10]. This greatly influences students’ learning motivation and has a significant effect on student learning outcomes, so the results of this study are in accordance with the theory and also reinforced by the results of the same study conducted by Awang et al, that bamboo dancing learning models provide better learning outcomes rather than direct learning models. The second conclusion is that (b) AQ has an effect on students’ mathematics learning outcomes, it is necessary to do further Anava tests by using multiple comparisons tests between columns [11]. The results of using calculations are shown in Table 3.

**Table 3** The results of the calculation of comparative tests between columns

| Comparative | Decision Test |
|-------------|---------------|
| . = .       | 4,061         |
| . = .       | 8,018         |
| . = .       | 1,135         |

Based on Table 3 it can be concluded that the mathematics learning outcomes of students who have AQ with climbers category are as good as students with AQ in the campers category, the results of students’ mathematics learning with AQ in the climbers category have better learning outcomes than students with AQ in the quitters category and the mathematics learning outcomes of students with AQ in the campers category are as good as students with AQ in the quitters category. In accordance with the theory stating that climbers, someone will face a problem or challenge without giving up and continue to struggle until getting a solution or solution and quitters are someone who does not have the will to solve a problem, in this type someone has no interest in facing a challenge [7] implementation in this study students in AQ with climbers category will be more challenged to solve math problems correctly and will not give up even though the questions are done with high complexity while students in the category quitters easily give up in working on math problems. These students tend to surrender and do not want to try and even learn if they experience difficulties. This is supported by research conducted
by Siti Rahayu and Dewi Retno Sari which produces mathematics learning achievement of students with AQ in the climbers category are better than students with AQ in the quitters category [12-13].

Whereas in the third conclusion (c) there is no interaction between student learning model and AQ towards students' mathematics learning outcomes, then this does not need to be carried out the further test. The conclusion can be seen from the average characteristics of the marginal or main effects between columns. each learning model is consistent, students' mathematics learning outcomes who is in the climbers AQ category are as good as students within the campers AQ category, the mathematics learning outcomes of students in the climbers AQ category have better learning outcomes than students in the quitters AQ category and students' mathematics learning outcomes in the campers AQ category as good as students in the quitters AQ category, while for each AQ category, conclusions can be drawn from the marginal characteristics or the main effect between lines is consistent i.e. students' learning outcomes with bamboo dancing model are better than direct learning.

In previous studies, Leonard and Niky Amanah examined the influence of Adversity Quotient (AQ) and Critical Thinking Ability on Mathematics Learning Achievement. The results of the calculation show that there is a positive influence of Adversity Quotient (AQ) and the ability to think critically together on mathematics learning achievement; there is a positive influence on Adversity Quotient (AQ) on learning achievement in Mathematics; and there is a positive influence on the ability to think critically on learning achievement in Mathematics. Furthermore Fitri Era Sugesti, Budiyono, Sri Subanti examined the Experimentation of Cooperative Learning Models Structured Numbered Heads (SNH) and Two Stay Two Stray (TSTS) with Approach in Realistic Mathematics Education Mathematics (RME) Learning Achievement Viewed from Adversity Quotient Student (AQ). The results showed (1) the SNH learning model with the RME approach gave better mathematics learning achievement than the TSTS model with the RME approach and direct learning. The TSTS model with the RME approach provides better mathematics learning achievement than direct learning, (2) students with high category AQ have better mathematics learning achievement than students with moderate, and low AQ categories, students with moderate category AQ have better mathematics learning achievement than students with low category AQ.

4. Conclusion and Suggestions

Based on the formulation of the problem, theoretical studies and data analysis it can be concluded that (1) students' mathematics learning outcomes using bamboo dancing learning model provide better learning outcomes than direct learning models, (2) students in the climbers category provide learning outcomes the same as students in campers category, students in the campers category gave better learning outcomes than students in the quitters category and students with campers category gave the same learning outcomes as students in the quitters category, (3) each learning model is consistent, students’ mathematics learning outcomes who is in the climbers AQ category are as good as students within the campers AQ category, the mathematics learning outcomes of students in the climbers AQ category have better learning outcomes than students in the quitters AQ category and students' mathematics learning outcomes in the campers AQ category as good as students in the quitters AQ category, (4) each AQ category is consistent that the results of students’ mathematics learning with bamboo dancing learning models are better than direct learning models.

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