The effect of ice-breaking using stand-up comedy on students' mathematical belief system

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The effect of ice-breaking using stand-up comedy on students' mathematical belief system

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Abstract. The purpose of this study was to determine the effect of ice breaking by doing stand-up comedy on the result of mathematical belief. This research was conducted at SMPN 37 Jakarta on 2nd grade in the 2nd-semester academic year 2016-2017. The research design used was the treatment by level 2x2 with learning method as a dependent variable which is the ability to understand the mathematics concept as a moderator variable and mathematical belief as an independent variable. The sampling technique used cluster random sampling. The result showed that the learning through icebreaking by doing stand-up comedy is able to increase the mathematics' belief of students. In addition, the learning method has the effect of mathematics' belief which depends on the ability to understand the mathematics concept of the student. Scholars who study by ice breaking with stand-up comedy teaching have the mathematics' belief higher than scholars who study by the conventional method.

1. Introduction

Mathematics is something that is not foreign to the community because of its usefulness in every activity of life, whether consciously or unconsciously. Learning mathematics is implemented at every level of formal education, but until now mathematics has not become an idolized lesson for students. Meaning idolized here relates to the sense of affective aspects, aspects that are often forgotten by teachers in teaching, so in learning that put forward only the results of learning from the cognitive aspect only. Affective domain includes feelings, emotions, mental or psychological belief of mathematics in mathematics lessons [1]. Confidence can arise from the desire to manifest itself to act and succeed in students. The belief of mathematics has a big role in welcoming the lesson. Abstract mathematics and many formulas, plus a rigid way of presenting material by the teacher make it even more difficult to understand. It can also be a cause for belief in low student mathematics. As Lazim pointed out, et al that beliefs of students towards mathematics relate to the role of teachers in learning [2]. Belief in mathematics is not innate but evolves through the socialization and activeness of each individual. There are three things that influence the beliefs of math such as self, object (mathematical education) and context (class) [3]. These three aspects are interrelated in shaping the beliefs of student mathematics.

Learning that only puts the students to solve routine problems and as the object of the listener only, so indirectly the students are only trained in numeracy skills in routine workmanship, without being directed to understand this concept is increasingly making belief to low student math. Ice breaking with standup comedy mathematics can be one of the learning solutions that can create a fun and comfortable learning environment so that the learning process seems meaningful. Ice breaking is one of the learning

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techniques included in the Quantum Learning model. According to DePorter, Quantum Learning is rooted in Dr. Georgi Lozanoc, a Bulgarian educator who experimented with what he called "suggestology" or "suggestopedia".

The principle is that suggestion can and does affect learning outcomes, and any detail gives positive or negative suggestions. Some of the techniques he uses to give positive suggestions are to seat students comfortably and provide teachers who are well-trained in teaching suggestive arts. [4]

The principle of Quantum Learning is in line with Ice Breaking which puts students at ease by learning in an atmosphere without tension. Ice Breaking did if the conditions in the class already feel bored and not conducive. One type of Ice Breaking is a form of funny stories or light humor that provokes the spirit to learn. By using Ice Breaking Humor Math can refresh the learning atmosphere, eliminate boredom, and relieve drowsiness [5]. By inserting Ice Breaking in every learning, it is hoped that the students' capability can be maximized and the learning atmosphere in the classroom becomes fresh again [6]. In addition, by implementing Ice Breaking with stand-up comedy mathematics can reduce the impression of rigid and spooky to the process of learning mathematics that goes on, because the stand-up itself basically dig up the anxiety or anxiety experienced by the ways more relaxed and fun so that students who feel The same anxiety about mathematics becomes mutually reinforcing and mutually expressed in order to get a pleasant solution. In the process of learning mathematics using Ice Breaking with standup comedy mathematics, students feel anxiety about mathematics that had been hit, will be increasingly lost and belief students in math are increasing.

In addition to learning methods, other things that need to get attention to the success of learning mathematics students is the individual difference is about the ability to understand the concept of mathematics. This difference will certainly affect the acceptance of each individual's material, so belief in mathematics will also influence. Understanding concepts have an important role for students to solve a mathematical problem [7]. By applying an understanding of mathematical concepts associated with other mathematical concepts to obtain a broader understanding of concepts. Understanding concepts is a skill that deals with comprehending mathematical ideas that are thorough and functional [8]. This causes the ability to comprehend the concept of mathematical role in the success of student learning. Students can be said to have the ability to understand the concept of mathematics if it can restate a concept that has been studied previously and can apply to various problem solving, so students are not just required to memorize the existing mathematical formulas.

2. Methods

This study was experimental in which the dependent variable was mathematical belief and independent variables were treatment and moderator. Treatment variables consisted of learning with ice breaking standup comedy mathematics (A_1) and conventional learning (A_2). Moderator variable was the students' understanding of concept mathematics ability consisting of high understanding of concept ability (B_1) and low understanding of concept ability (B_2). The study design used treatment by level.

Table 1. Study Design with Treatment by Level 2x2

Understanding Ability (B)	Learning Methods (A)	
	Ice Breaking by doing Stand-up comedy (A_1)	Conventional (A_2)
High (B1)	A_1B_1	A_2B_1
Low (B2)	A_1B_2	A_2B_2

Remark:

A_1B_1 = Mathematical belief score for group of students receiving learning with Ice Breaking by doing Stand-up comedy with high understand the mathematics concept ability.

A_1B_2 = Mathematical belief score for group of students receiving learning with Ice Breaking by doing Stand-up comedy with low understand the mathematics concept ability.

A_2B_1 = Mathematical belief score for group of students receiving conventional learning with high understand the mathematics concept ability.

A_2B_2 = Mathematical belief score for group of students receiving conventional learning with low understand the mathematics concept ability.

The population in this study is the target population of all students of SMP Negeri 37 Jakarta in the even semester of the academic year 2016/2017, the population reaches all students of class VIII. Sampling technique is done by Cluster Randomized Sampling. Randomization is done by drawing 4 groups of students of class VIII. Of the 5 classes, two classes were randomly assigned, namely class VIII-A and class VIII-B where for class VIII-A consisted of 36 students and class VIII-B consisted of 36 students. The two classes were randomly assigned to the experimental class and control class, namely class VIII-B as experimental class that received ice breaking learning with standup comedy mathematics and class VIII-A as a control class with conventional learning. Then after performing the students' ability to master the mathematical concept, the determination of the group's ability to develop high mathematical concepts and the ability of the low learning mathematical concepts is done by arranging the sequence of respondents based on the scores of the mathematical concepts of mathematical concepts obtained, i.e. the highest scores to the lowest scores. To get a high group and low group of S. Naga [9] suggests, the size to determine the high and low group is $33\frac{1}{3}\%$ $\left(M_T = M_R = 33\frac{1}{3}\%\right)$ Where this

number is quite a contrast and reliable. Thus, the sample of this study consisted of two classes, each class divided into two groups, taking $33\frac{1}{3}\%$ high initial skill students and $33\frac{1}{3}\%$ low initial ability students. The sample distribution can be seen in Table 2 below.

Table 2. Sample Distribution in Each Class

Understanding Ability(B)	Learning Methods(A)		Total
	Ice Breaking by doing Stand-up comedy (A_1)	Conventional (A_2)	
High (B_1)	12 persons	12 persons	24 persons
Low (B_2)	12 persons	12 persons	24 persons
Total	24 persons	24 persons	48 persons

Belief instrument developed was Likert scale with 5 options consisting of 47 valid items. The instruments consisted of five indicators, namely the certainty of knowledge, the role of lecturer, systematic process, innate ability, quick learning. The respondents' responses were analyzed to test the construct validity using factor analysis with the results. Value of $KMO = 0,814 > 0,7$ means the mathematical belief instrument is acceptable. Extraction (PCA), Eigenvalue is 5 factors. The result of *Rotated Component Matrix*, with loading factor criteria < 0.30 and > -0, 30, means that point 9, 12, 40 is deciduous (not valid) so that only 47 items that are valid and can be used as measuring tool.

While the instrument ability to understand the mathematical concepts of students by using essay test. From the validity test with Product Moment Person formula [10]. There are 10 questions got 8 valid problems with reliability test with *Alpha Cronbach* [11] $r_{hitung} = 0,484 > 0,339 = r_{tabel}$. So the instrument of the understanding ability of students' mathematical concept is reliable.

3. Results and Discussion

Table 3, shows that the students' average mathematical belief score for groups A_1 and A_2 are 152,88 and 148,42, group A_1B_1, A_1B_2, A_2B_1 and A_2B_2 are 170,58; 135,17; 151,17 and 145,67. This score is much different descriptively can be inferred group A1 and A2. So that group A_1B_1, A_1B_2, A_2B_1.

Table 3. Average Mathematical belief Score

Understanding Ability(B)	Statistics	Learning Methods(A)	
		Ice Breaking by doing Stand-up comedy (A_1)	Conventional (A_2)
High (B1)	N	12	12
	Mean	170,58	151,17
	St. Deviation	16,65	15,23
Low (B2)	N	12	12
	Mean	135,17	145,67
	St. Deviation	11,56	15,71
Total	N	24	24
	Mean	152,88	148,42
	St. Deviation	22.88	15,39

The result of analysis of two-way ANOVA, compare belief of mathematical score on group A1 and A2 obtained sig value. = 0.005 $<\alpha$ = 0.05 and the average score of group A1 mathematical beliefs is higher than group A2. This means that there is a mathematical belief score of the student group subjected to Ice Breaking by doing Standup comedy (A1) higher than the conventional belief mathematical score (A2). Mathematical learning with stand-alone math has four benefits: building relationships and improving communication, stress reduction tools, making learning interesting, and strengthening memory [12]. So that learning more fun, not tense and student love with math will be better [13]. Between beliefs of mathematics and mathematics learning are interrelated forming a circular process [14]. Thus, the more varied and effective the learning of make belief towards the higher the mathematics.

The result of interaction test between the learning method and the comprehension ability of mathematical concept (A * B) obtained sign = 0.007 $> \alpha$ = 0,05, this means there is the significant influence of learning method interaction and the ability to understand mathematical concept of the student to believe mathematics score. Learning with Ice Breaker is energizer before giving the material and creation of learning atmosphere from passive to active, from rigid to motion (familiar), from saturated to cheerful (fresh), and able to rouse passion learn [15]. While the ability to comprehend the mathematical concepts of students is a conceptual understanding refers to the ability of students to connect new ideas in mathematics with ideas they know [16]. Students who have the ability to understand high mathematical concepts mean it can be easier to follow the learning and connect ideas so that math lessons become more fun.

Conclusion

Belief in mathematics is one of the effective aspects that influence students' success in learning mathematics. Learning by using icebreaking with mathematical standup comedy is one of the learning methods that will help students improve belief in mathematics compared to conventional learning.

Individual differences such as the ability to comprehend mathematical concepts have a significant effect on belief in student math. Furthermore, for students with the high understanding of mathematical concepts if given learning with ice breaking standup comedy mathematics average score belief to mathematics higher than that given conventional learning. While for students with low comprehension of mathematical concepts, statistic test results showed no differences between groups of students using learning with ice breaking standup comedy mathematics and conventional learning. Therefore, further

study is needed to determine the appropriate learning for the group of students with the ability to comprehend low mathematical concepts.

From this research is expected teachers in providing education services to students, not only pay attention to the results of learning but also pay attention to the affective aspects. Teachers are also expected to apply learning to ice breaking standup comedy mathematics in the learning process, to believe in mathematics of students, which will also have an impact on improving student learning achievement.

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