

## The Influence of Self Concept, Autonomy Education, Creativity and Students' Creativity Towards Result Learn the Physics

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### Abstract

Self-concept and autonomy education are two internal factors that give students the strength of mind so that it can encourage students' learning process, achievement, initiative, and creativity. This research aims to investigate whether or not there is a direct or an indirect effect of self-concept, autonomy education, and creativity on student's physics study results. The method used was survey with a sample of 190 students spread across six senior high schools in the Tuban Regency, namely SMAN 1 Jatirogo, SMAN Parengan, SMAN Bangilan, SMAN 1 Tuban, MA Assalam and MAN Rengel with stratified random sampling techniques. The data analysis technique used is the path analysis technique. The result shows that: (1) There are 29.2 % of direct influence of self-concept towards student's physics study result, 13.8% of indirect influence of creativity, and 10.6% of autonomy education; (2) There are 17.1 % of direct influence of autonomy education towards result learn the physics, and 10.9 % of indirect influence through creativity; (3) The influence of self-concept towards creativity indirectly are 41.2% and indirectly through autonomy education are 19.9%; (4) There are 33.5% of direct influence of creativity towards student's physics study result; (5) The direct influence of autonomy educations towards creativity are 32.2%; and (6) There are 62% of direct influence of self-concept towards autonomy education.

**Keywords:** self-concept, autonomy education, creativity.

### INTRODUCTION

Education is every effort, influence, protection and assistance given to students that aim to mature the child [1]. Factors from within students are important in determining learning success, because students as learning subjects. Competencies that must be achieved by students in learning objectives include three domains, namely cognitive, affective and psychomotor. The self concept and Autonomy Education are two internal factors that included in the affective domain and provide mental strength for students, so that it can encourage the learning process. The self concept is thing that greatly influences the adjustment and is important factor in one's self development [2]. While the nature of Autonomy Education is trait that exists in students that show dependence levels toward their own abilities, both in terms of academic and non-academic [3]. Such traits can be fostered through education in schools, namely by creating democratic climate and encouragement towards the development of student creativity by educators.

Basically there are two students thinking processes, namely convergent thinking and divergent thinking. Convergent thinking processes require students to find one correct answer, whereas divergent thinking processes require students to explore various possible answers to problem. In the thinking process, students need the integration of convergent and divergent thinking processes to realize student creativity. Both of these thinking processes must be owned by senior high school students (SHS), because the intellectual development level of senior high school students is at the level of formal operations that have ability at the abstract thinking stage and able to formulate all possibilities and determine which possibilities are most likely to occur based on thinking skills analytical and logical [4].

Teaching physics in senior high school mostly emphasizes only one process of understanding natural phenomena, namely the deductive process. Partial deductive processes do succeed in making children analytically critical, but their side influences kill the child's creativity in combing facts from complicated phenomena so as to produce hypothetical concepts or simple theoretical models. Teaching that only emphasizes the deductive process can also hinder the process of finding truth inductive namely truth based on observable or measurable facts, for example students are taught trained to

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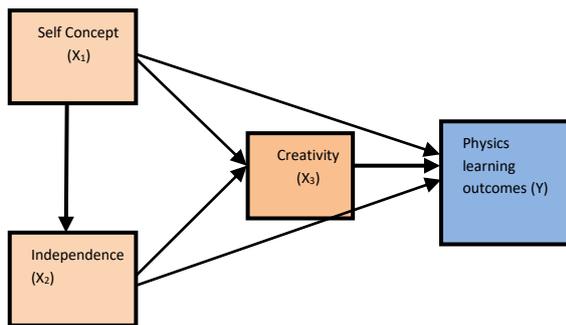
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lower formulas, otherwise given no space to practice generalizing, abstraction, or idealization of facts and natural phenomena to formulate theoretical model. By doing this generalization the child's creativity grows in seeing natural phenomena [5].

**MATERIAL AND METHOD**

This research type is ex post facto research. The method used in this research is Survey Exploratory method with a quantitative approach that aims to determine the causal relationship between variables, namely the self-concept variable (X1) toward Autonomy Education (X2), self-concept variable (X1), Autonomy Education (X2) toward creativity (X3) and student learning outcomes (Y).

This study will look at the direct or indirect relationship between the independent variables and the dependent variables, so that research design can be made using path analysis as follows:



**Figure 1.** Research Path Design

The study design describes the relationship of X1, X2, X3 directly and indirectly toward Y.

Explanation:

1. Variables that influence are called exogenous variables
2. Variable that is influenced is called an endogenous variable.
3. X1 is an exogenous variable for X2, X3 and Y
4. X2 is an exogenous variable for X3 and Y
5. X3 is an exogenous variable for Y
6. X2, X3 and Y are endogenous variables for X1
7. X3 and Y are endogenous variables for X2
8. Y is an endogenous variable for X

**Data Collection**

The data collection method used in this research is survey explanatory. The population in this study were students of class XI of SMA/MA in Tuban Regency in the 2010/2011 academic year in 44 schools consisting of 17 senior high schools, 2

Islamic senior high schools, 10 private senior high schools, and 15 private Islamic senior high school. The population is grouped into three, namely accredited group A (K-A) totaling 6 schools (4 SMA and 2 MA), accredited group B (K-B) totaling 24 (18 SMA and 6 MA), and accredited group C (K-C) totaling 14 schools (5 SMA and 9 MA) (Data from the Education Office in Tuban Regency, 2009). The samples taken by stratified random sampling. After being divided into 3 groups, each group will be randomly sampled at 15% [6]. So that the total sample in this study were 6 schools originating from 1 SMA/MA with the predicate of K-A (SMA Negeri 1 Tuban), 3 SMA/MA from the predicate K-B (SMA Negeri 1 Jatirogo, MA Negeri Rengel and MA Assalam) and 2 SMA/MA from the K-C predicate (SMA Negeri Bangilan, SMA Negeri Parengan). Each school selected as a sample is taken one class at random to represent the school. If totaled the sample in this study were 190 students.

The instruments used to collect data in this study are:

1. Self concept test  
This instrument is used to measure student's self concept. The self concept test in this research was in the form of direct type questionnaire that contained 38 statements. This questionnaire was adapted from similar test developed by Leonard and Yaumi (2008) with reliability of  $r_{11} = 0.802$ .
2. Autonomy Education Test  
This instrument is used to measure the student independence level in the education field. The Autonomy Education test in this study also took the form of direct type questionnaire that contained 38 statements. This questionnaire was adapted from similar test developed by Yaumi and Sriyono (2008) with reliability of  $r_{11} = 0.9200$ .
3. Student Creativity Test  
This instrument is used to measure the student creativity level in problem solving. The creativity test in this study took the form of description with open answers. This test consists of 10 breakdown questions with open answers. The making of this test was adapted from a similar test developed by Siswono (2003) and now developed by researchers [7].
4. Physics Learning Outcomes Test  
This instrument is used to measure the level of heat material mastery. The learning achievement test in this research is in the form of objective and description with the

number of 15 multiple choice questions with reasons and 5 description questions. This test was developed by the researcher by adapting it from various sources.

## **RESULT AND DISCUSSION**

### **1. Direct Influence of Self Concepts Toward Student's Physics Study Result (Path Model 1)**

The path analysis results obtained the value of  $t$  count  $>$   $t$  table (0.05; 190) in each test, meaning that there is direct influence between self-concept and Autonomy Education. The influence magnitude is seen from the path coefficient ( $P_{ij}$ ) generated.  $P_{41} > 0.05$  (0.08  $>$  0.05), meaning that the path is considered significant or there is influence between the self-concept variable and the physics learning outcome variable. The influence of self-concept toward learning outcomes for each of the first and second tests was 10.9% and 8% was considered significant.

The large difference in influence or percentage of contribution between test I and test II is close to albeit declining but not significant. This shows that instilling a positive self-concept (according to indicators) can be applied in learning in the classroom, so that it can have a positive influence toward learning outcomes.

According to Gunawan, states that students who have confidence and perceptions as well as positive outlook about themselves will be able to improve their physical learning outcomes [8]. These perceptions and perspectives need to be built and developed especially in the school environment, because self-concept is not innate from birth. Schools as one of the closest environments for students strive to integrate the formation of self-concepts into teaching and learning activities inside and outside the classroom. School activities related to the formation of self-concept carried out throughout the learning period, that teacher intervention in class activities for the formation of self-concept gives the most real response when students are in high school where students at this age have the highest involvement in classroom activity compared to their peers the younger in elementary school or the older in college [9]. The aspects of self-concept are as follows: 1) Physical aspects, 2) psychological aspects, 3) social aspects, and 4) academic status. Indicators on this aspect will influence the development of

positive self-concepts if in the environment of students accustomed to experience in school affects students' perceptions of academic ability, social acceptance, popularity, behavior, self-efficacy, and even physical attraction [10]. Students' perceptions of their academic abilities will affect their performance in school, motivation towards academic assignments, and predictions of future success which will ultimately also affect their learning outcomes. This is in line with what researchers encounter in the field. Students with positive self-concepts will have good learning outcomes. Children's feelings about themselves during school can influence the development of their self-concept, especially their academic self-concept [11].

Based on the description that has been stated, it can be concluded that self-concepts including physical, psychological, social and academic aspects have a positive influence toward student physics learning outcomes.

### **2. The Influence of Self-Concepts toward Student's Physics Study Result through Creativity (Path Model 2)**

Based on the results of the path analysis obtained value of  $t$  count  $>$   $t$  table (0.05; 190) in each test and each path. Research gives the results of  $t$ count falling in critical areas or falling in the rejection area  $H_0$ . So  $H_0$  is rejected, meaning that there is a direct influence between self-concept and creativity and there is a direct influence between creativity and physics learning outcomes.

When compared with the path model 1, the indirect influence of self-concept toward learning outcomes through creativity ( $X_1$ - $X_3$ - $Y$ ) = 6.11% is smaller than the direct path between self-concept toward learning outcomes ( $X_1$ - $Y$ ) = 8% This means that to achieve learning outcomes intervening variables are not needed, namely creativity for the path model that has been created. The large difference in influence or percentage of contributions between test I and test II is close to albeit declining but not significant, namely the indirect influence of self-concept toward physics learning outcomes through creativity with contributions of 12.6% (test I) and 6.1 % (test II), it shows that instilling positive self-concept and creativity through accustoming creative thinking can be applied in learning, so that it can positively influence learning outcomes.

According to Germer self-concept is one of the keys to building open communication

between teacher and student so as to create active participation between the two in teaching and learning activities. With open communication students can express ideas or opinions that may be new to them. Besides that students who have positive self-concepts are convinced of their ability to overcome problems so that they can increase the creativity or product of a person's different creative thinking.

Creative thinking as product of creativity needs to be trained in learning as students are accustomed to solving problems with open-ended questions. Problem solving in an effort to encourage creative thinking in physics can use the concept of a problem in a task situation. The low influence of creativity toward learning outcomes or the lack of creativity variables in this path is one of them because students are not accustomed to and are not trained in questions that require students to think creatively and there are students with low self-concepts who have high levels of creativity. The teacher asks students to connect the information that is known and information toward the work to be done, so that the task is new to students [12]. If he immediately recognizes the action or ways to complete the task, then the task is a routine task. If not, then it is problem for him. So the concept of the problem depends on time and individual. Problem solving is taught and explicitly the goal of learning physics, because problem solving has benefits, namely: (1) developing cognitive skills in general, (2) encouraging creativity, (3) problem solving is part of the physics application process, and (4) motivate students to learn physics. Based on these explanations, problem solving is one way to encourage creativity as a product of students' creative thinking.

Based on the things explained above, it can be concluded that between creativity and self-concept influences learning outcomes, but the contribution is smaller when compared to the direct path, where creative thinking means involving positive perspective (self-concept), whereas with the self-concept possessed will make a thinker more successful. As long as students are confident in their ability to learn, able to improve themselves; and have the ability to express aspects that are not liked and try to change it. With habituation in the thinking process it will affect the level of student creativity. When they have good creative thinking skills, it will affect their ability to solve problems. Through training in developing their abilities, it is hoped that this will have an

influence on their thinking style, which in turn will have an influence on good learning outcomes.

### **3. The Influence of Self-Concepts toward Student's Physics Study Result Through Autonomy Education (Path Model 3)**

This path is also indirect influence of self-concept toward physics learning outcomes through Autonomy Education. The results of path analysis obtained the value of  $t$  count  $>$   $t$  table (0.05; 190) in each test and each path. Research gives the results of  $t$  count falling in critical areas or falling in the rejection area  $H_0$ . So  $H_0$  is rejected, meaning that there is a direct influence between self-concept and Autonomy Education and there is direct influence between Autonomy Education and physics learning outcomes.

When compared with path model 1, the indirect influence between self-concept and learning outcomes through Autonomy Education ( $X1 - X2 \rightarrow Y$ ) = 12.3% is greater than the direct influence between self-concept toward learning outcomes ( $X1 - Y$ ) = 8%. This means that to achieve high learning outcomes, intervening variables are needed, namely Autonomy Education for the path model that has been created. The large difference in influence or percentage of contributions between test I and test II is almost close to even increasing, namely the indirect influence of self-concept toward learning outcomes in physics through Autonomy Education with a contribution of 6.0% (test I) and 12.3% (test II), it shows that instilling positive self-concept of Autonomy Education is applied in learning, so that it can positively influence student learning outcomes.

These donations indicate the independence of education needs to continue to be instilled and improved in students. Brooks and Emmert revealed that through learning events new behaviors can be obtained, so that with new behaviors students can make adjustments and self-development in accordance with the demands of life [13]. The self-concept that is owned by someone, both positively and negatively will affect the way the individual evaluates himself and the environment because it will greatly affect his behavior. Individuals will tend to behave according to the self-concept they have. Positive self-concept will lead to self-confidence in students which ultimately this attitude will lead to independence in themselves as well and eventually will also affect the learning outcomes [14]. This is in line with what

researchers encounter in the field. Students with positive self-concepts will have high independence and good learning outcomes.

If one's self-concept is positive, individuals will tend to develop positive attitudes about themselves, such as good self-confidence and the ability to see and evaluate themselves positively. People with a positive self-concept tend to be able to cause good adjustments to the social environment. Individuals with negative self-concepts will have difficulty adjusting to the social environment.

Delivery of physics lessons that require active student learning, requires active participation of students in learning activities. Active participation can be carried out if supported by social and psychological independence of students is important because the individual is essentially always trying to adjust actively to their environment. Without independence all efforts are difficult to do steadily to manage life and the environment.

From the description above it can be concluded that the study results provide significant results, although the value is not too large but this proves that there is positive and significant indirect influence between students' self-concepts toward physics learning outcomes through Autonomy Education. In other words, students who have confidence and perceptions and a positive outlook about themselves will be able to improve physics learning outcomes. These perceptions and perspectives need to be built and developed, both internally and externally, so students should personally appreciate all aspects of their lives, and all elements outside themselves (including teachers, principals, parents and the community) should also provide optimal appreciation and appreciation so students can build positive self-concepts.

#### **4. Direct Influence of Autonomy Education Toward Student's Physics Study Result (Path Model 4)**

The results of the path analysis obtained  $t_{count} > t_{table}$  (0.05; 190) in each test, meaning that there is direct influence between the independence of education with learning outcomes. The influence magnitude is seen from the path coefficient ( $P_{ij}$ ) generated.  $P_{42} > 0.05$  (0.121 > 0.05), meaning that the path is considered to be significant or there is influence between the Autonomy Education variable with the physics learning outcome variable. The

influence of Autonomy Education toward learning outcomes for each of the first and second tests was 9.5% and 12.1% were considered significant. The large difference in influence or percentage of contribution between test I and test II was close, even increasing but not significant. It shows that instilling positive Autonomy Education can be applied in learning, so that it can positively influence student learning outcomes.

Students with high Autonomy Education have high physics learning outcomes and vice versa for students who have low independence (often dependent on others) have low physics learning outcomes [15]. These results support research, finding that adolescent independence is significantly correlated with education variables [16]. This is in line with what researchers encounter in the field. Students with independence high attitude will have good physics learning outcomes.

In the process of teaching and learning need to be emphasized also the independence of learning by students. From independence will grow positive attitudes that will help the success of learning, among others full of responsibility in learning this is confident, not dependent continuously on others, firm in making decisions in learning. With high learning independence it is possible for students to improve their learning achievement.

The research results obtained to measure the independence of student education indicate that it is still low. In this study students tend to depend on others in completing assignments. Lack of habituation in independent assignments will also affect students in learning outcomes. Thus the independence of student education in this case the level of independence of students in academic assignments will help students improve learning outcomes in physics.

#### **5. Influence of Autonomy Education toward Student's Physics Study Result through Creativity (Path Model 5)**

This path is indirect influence of Autonomy Education toward learning outcomes in physics through creativity. The results of the path analysis for this model obtained  $t_{count} > t_{table}$  (0.05; 190) in each test and each path. Research gives the results of  $t_{count}$  falling in critical areas or falling in the rejection area  $H_0$ . So  $H_0$  is rejected, meaning that there is direct influence between the independence of education with

creativity and there is direct influence between creativity and learning outcomes.

When compared with path 4, the large indirect influence between Autonomy Education toward learning outcomes through creativity ( $X_2 - X_3 \rightarrow Y$ ) = 15% greater than the direct influence between Autonomy Education toward learning outcomes ( $X_2 - Y$ ) = 12, 1% This means that to achieve high learning outcomes, intervening variables are needed that is creativity in this path model. The large difference in influence or percentage of contribution between test I and test II is almost close to even increasing, namely the indirect influence of Autonomy Education toward learning outcomes through creativity with contributions of 8.7% (test I) and 15% (test II). It shows that instilling positive Autonomy Education and creativity through accustoming creative thinking can be applied in classroom learning, so that it can have a positive influence toward learning outcomes.

In behaving independently between individuals who are different from one another, this is influenced by many factors. Both from within students themselves and from outside. Penick states the term "A high degree of independence can produce creative actions, products or ideas that are characteristic of creative individuals [17]. This gives understanding that students who have high independent nature, have elements of full responsibility, confidence, and full of creativity. These characteristics can be fostered through education in schools, namely by creating democratic climate and full of encouragement towards student creativity by educators who can ultimately improve student learning outcomes. This is in line with what researchers encounter in the field. Students with high Autonomy Education will also have high creativity which will eventually improve learning outcomes. In other words, productive individuals always appear in creativity to make the most of their potential.

Through the development of the nature of independence will influence toward the students thinking so that it will provide increase in students' creative thinking abilities (creativity). Increased student thinking ability will have an influence toward improving student learning outcomes. This means that student learning outcomes increase when Autonomy Education is trained so that it affects their way of thinking or Autonomy Education has an influence toward creativity.

#### **6. The Direct Influence of Self-Concept Toward Creativity (Path Model 6)**

The results of the path analysis obtained  $t$  count >  $t$  table (0.05; 190) in each test, meaning that there is direct influence between self-concept and creativity. The influence magnitude is seen from the path coefficient ( $P_{ij}$ ) generated.  $P_{31} > 0.05$  (0.291 > 0.05), meaning that the path is considered significant or there is an influence between the self-concept variable and the creativity variable. The influence of Autonomy Education toward learning outcomes for each of the first and second tests was 35.7% and 29.1% were considered significant. The large difference in influence or percentage of contribution between test I and test II is close, although decreasing but not significantly. This shows that instilling a positive self-concept can be applied in learning, so that it can positively influence the level of student creativity.

Looking at the influence magnitude of self-concept toward creativity (creative thinking products), students who have self-confidence and perceptions and positive perspective about themselves will be able to increase their creativity. According to Germer and Yager stated that with a positive self-concept will minimize the emergence of learning difficulties in students. Reducing learning difficulties is what ultimately allows students to increase their creativity in solving problem. From this, it appears that positive self-concepts are driving the academic success. These perceptions and perspectives need to be built and developed especially in the school environment, because self-concept is not innate from birth. Schools as one of the closest environments for students strive to integrate the formation of self-concepts into teaching and learning activities inside and outside the classroom. The learning activity involves students' creative thinking skills.

#### **7. The Influence of Self Concepts Toward Creativity Through Autonomy Education (Path Model 7)**

This path is also indirect influence of self-concept toward creativity through Autonomy Education. The results of the path analysis obtained the value of  $t$  count >  $t$  table (0.05; 190) in each test and each path. Research gives the results of  $t$ count falling in critical areas or falling in the rejection area  $H_0$ . So  $H_0$  is rejected, meaning that there is direct influence between self-concept and Autonomy Education and there

is direct influence between creativity and Autonomy Education.

When compared with path 6, the indirect influence between self-concept toward creativity through Autonomy Education ( $X1 - X2 - X3$ ) = 35.1% is greater than the direct influence of self-concept toward creativity ( $X1 - X3$ ) = 29, 1%. This means that to achieve high creativity, intervening variables are needed namely Autonomy Education. The large difference in influence or percentage of contribution between test I and test II is almost close even increasing, namely the indirect influence of self-concept toward creativity through Autonomy Education with contributions of 32.4% (test I) and 35% (test II). It shows that instilling self-concept, positive Autonomy Education and creativity through accustoming creative thinking can be applied in learning. If the higher the student's self-concept, the higher his creativity.

An independent learning package will not be truly independent if the choice of learning activities is not in accordance with the learning styles and abilities of each student. If a student's self-concept is positive then he will more easily determine their learning style and will eventually foster new ideas that are more creative. The optimal development of the ability to think creatively is closely related to the way of teaching [18]. In a non-authoritarian atmosphere, when learning toward their own initiative can develop because the teacher puts trust in the ability of children to think and dare to express new ideas, and when children are given the opportunity to work in accordance with the interests of their needs, then creative abilities can flourish. With self-confidence and positive self-concept, it can support the creativity (creative thinking) of students. Weisberg explained that there is a relationship between problem solving and the ability to think creatively. This is in line with what researchers encounter in the field. Students with positive self-concepts will have high independence so that it will have an influence toward increased creativity [19].

## CONCLUSION

Based on the results of data analysis and discussion, several conclusions can be made as follows:

1. The level of self-concept, autonomy education, creativity and result learn the physics of class XI high school students in

Tuban regency are in the category of strong, moderate, creative moderate and fair.

2. There are 29.2 % of direct influence of self concept towards student's physics study result, 13.8% of indirect influence of creativity, and 10.6% of autonomy education;
3. There are 17.1 % of direct influence of autonomy education towards result learn the physics, and 10.9 % of indirect influence through creativity;
4. The influence of self concept towards creativity indirectly are 41.2% and indirectly through autonomy education are 19.9%;
5. There are 33.5% of direct influence of creativity towards student's physics study result;
6. The direct influence of autonomy educations towards creativity are 32.2% ; and
7. There are 62% of direct influence of self concept towards autonomy education.

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