Mediation Effect of Computer Self-Efficacy Between Learning Motivation and Learning Achievement

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ABSTRACT

Factors that influence learning achievement include learning motivation and self-efficacy. This study aims to explain the effect of learning motivation, and self-efficacy on student achievement. The population used in this study were students of the Faculty of Economics, University of 17 August 1945, Surabaya. The sampling technique is random sampling. The data collection used is documentation and questionnaires. The design of this research is an explanation of the variables of learning motivation (X1), self-efficacy (X2), and learning achievement (Y). The data analysis technique used is Linear Regression Analysis. The results showed that learning motivation and self-efficacy partially affected the learning achievement of undergraduate students. The limitations of this study are limited to students of the Management S1 program, so it cannot be generalized to other populations. Further researchers are expected to add other variables that affect learning achievement and can add data collection techniques with observation and interviews so that research results are more accurate.

Keywords: Learning Motivation, Computer Self-Efficacy, Learning Achievement.
INTRODUCTION

With today's technological advancements, the Internet has gradually become closely linked to everyday life. Blogging is popular on the Internet, a trend that is changing people's habits of obtaining information and using media. In addition to classroom learning, students have further opportunities to study at home via the Internet, a phenomenon that indirectly affects on-site instruction. Student learning does not only depend on lecture lecturers or reading textbooks; they are gradually adopting technology-based learning. Therefore flexible and interactive multi-media teaching, such as pictures, audio, and pictures on blogs, instructors enable learners to actively receive knowledge and information. Blogs and websites are not completely the same, because they have the characteristics of interaction, real dialogue, connection, and low threshold. Blogs reveal more advantages than traditional media, such as telephone interviews, emails, forums, etc. Through blogs, lecturers can directly discuss with students, without limitation of location or time, to identify student learning and demands. Students can learn the thoughts and ideas of other classmates through the Internet. In recent years, educational authorities have actively promoted information technology-based instruction to develop e-courses. However, digital learning does not only develop traditional teaching materials on computers but must increase the effectiveness of learning and combine digital teaching materials with creative strategies and instructional activities. Thus, it can reveal the advantages of technology-based instruction. The problem that can be formulated from this research is whether computer self-efficacy can affect students' motivation and learning achievement.

LITERATURE REVIEW

Learning Motivation

The ARCS model proposed by Keller is a tool for analyzing learning motivation demands to show instructional strategies for students. His model combines cognition, humanity, behavior, and social learning theory, and is constructed through reorganization. It aims to improve the systematic instructional design that triggers the participation and interaction of learners through the design of teaching materials for the implementation and application of teacher practice. Its contents include attention, relevance, trust, and satisfaction. Attention refers to the teaching process leading to the curiosity, and interest of students; relevance refers to linking design teaching to the demands, goals, and motivations of learners; confidence means that before assigning learning assignments, teachers must recognize the level of students and help students build confidence in learning; Satisfaction refers to the sense of achievement obtained by the learner. With the above, students will be more willing to follow the teacher and have high learning motivation [1].
According to Sardiman, learning motivation is the driving force within students that causes learning activities that ensure the continuity of learning activities that provide direction to learning activities so that the goals desired by the learning subject can be achieved. Through research on learning motivation and self-efficacy, many scholars have demonstrated their relationship [2]. Schunk suggested that self-efficacy will influence learners’ task selection, academic effort, persistence, and learning achievement. Compared to learners who question their own learning competencies, students with high self-efficacy are more persistent when facing difficulties and challenges, and work harder in academic studies [3]. Pajare expressed views on motivation and self-efficacy and suggested that motivation will be influenced by individual expectations regarding outcomes. When expected results and goals can be successfully met, motivation will increase. The expected results are related to individual self-efficacy, as students with high self-efficacy, efficacy are more confident in their ability to meet goals and are more persistent in learning. Therefore, self-efficacy is a key factor in expected outcomes and motivation [4].

Learning motivation is an internal and external encouragement for students who are studying. These indicators include: 1) There is a desire and desire to succeed; 2) Encouragement and need for learning; 3) Hopes and aspirations for the future; 4) Appreciation in learning; 5) Interesting activities in learning; 6) A conducive learning environment [5].

**Mediation of Computer Self-efficacy**

Mediation of Computer Self-efficacy is included as an internal factor in the form of self-concept [6]. Computer self-efficacy is a belief in one's ability to be able to use/operate a computer to achieve a goal [7]. CSE can make a person more confident in identifying academic assignments, setting benchmarks for important tasks that must be completed, and taking responsibility for their own success in achieving their scholastic goals [8]. Students with high CSE are able to do things with confidence and when faced with problems they are able to overcome them which affects their learning success [9]. But in reality, reveal that there is still a lack of full attention from most teachers on student self-efficacy. Students with low CSE certainly do not have confidence in their abilities so if they encounter a problem, they will consider it as something that must be avoided, resulting in a decrease in learning achievement [10]. The mathematical critical thinking self-efficacy indicator used in this study was adapted from the indicators developed by Sudrajat so that the self-efficacy indicators in this study are: 1) Feel interested in answering questions that involve mathematical critical thinking; 2) Feel optimistic in answering questions that involve mathematical critical thinking; 3) Feel confident that you can answer questions that involve mathematical critical thinking; 4) Increase efforts to solve problems involving mathematical critical thinking; 5) Committed to solving problems involving mathematical critical thinking; 6) Respond to various situations and conditions in a positive way; 7) Based on previous learning experiences [11].
Bandura suggests that self-efficacy refers to a person's belief in the successful execution of a task. Belief in success is based on four kinds of experiences, namely: 1) positive experience: which means a person's cognition of previous performance of similar behavior; 2) observational learning: evaluating and influencing self-efficacy with the learning model; 3) verbal affirmation: peer praise can increase one's ability to believe in their competence and belief in a successful action, and 4) one can avoid action barriers and increase self-efficacy by reinforcing the emotions of weakness [12].

As for the study of self-efficacy and learning achievement, Bandura suggested that performance is the most reliable and direct factor of self-efficacy, and it will affect students confidence and determination in completing tasks [13].

**Learning Achievement**

Chaplin said that: "Achievement is the result achieved (from what is done and expected).” From this definition, learning achievement is the mastery of knowledge and skills developed by subjects, which are usually aimed at the values or numbers given by the state [14].

Dimyati and Mudjiono classifies learning achievement into three domains, namely cognitive, affective, and psychomotor [15].

**Table 1. Learning Achievement**

<table>
<thead>
<tr>
<th>No</th>
<th>No Type of Achievement Work</th>
<th>Performance Indicators</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td><strong>Cognitive realm</strong></td>
<td><strong>Work Performance Indicator</strong></td>
</tr>
<tr>
<td></td>
<td>a. Knowledge (knowledge)</td>
<td>a. Can explain</td>
</tr>
<tr>
<td></td>
<td>b. Comprehension (understanding)</td>
<td>b. Can define verbally himself</td>
</tr>
<tr>
<td></td>
<td>c. Application (application)</td>
<td>c. Can provide examples</td>
</tr>
<tr>
<td></td>
<td>d. Analysis (analysis)</td>
<td>d. Can use properly</td>
</tr>
<tr>
<td></td>
<td>e. Synthesis (synthesis)</td>
<td>e. Can decipher</td>
</tr>
<tr>
<td></td>
<td>f. Evaluation (Evaluation)</td>
<td>f. Can classify/sort out</td>
</tr>
<tr>
<td></td>
<td><strong>Affective Realm</strong></td>
<td>g. Can connect</td>
</tr>
<tr>
<td></td>
<td>a. Receiving</td>
<td>h. Can conclude</td>
</tr>
<tr>
<td></td>
<td>b. Responding (Member response)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>c. Valuing (Value)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>d. Organization (Organization)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>e. Characterization (characterization)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td><strong>Psychomotor domain</strong></td>
<td>a. Denying</td>
</tr>
<tr>
<td></td>
<td>a. Movement and action skills</td>
<td>b. Institutionalize or abolish</td>
</tr>
<tr>
<td></td>
<td>b. Verbal and non-verbal expression skills</td>
<td>c. Incarnate in personal and daily behavior</td>
</tr>
<tr>
<td></td>
<td></td>
<td>d. Coordinate movement of eyes, hands, feet, and other body parts</td>
</tr>
</tbody>
</table>

Table 1. Learning Achievement
Factors That Affect Learning Achievement

Measurement of Intelligence (IQ) is a benchmark of learning achievement, success in learning achievement depends on IQ, and IQ here plays an important role in learning achievement. However, several cases prove that a high IQ does not guarantee success in learning and living in society. From that statement, it can be concluded that IQ is not the only one to measure and develop learning achievement.

Other factors that participate in influencing learning achievement according to Muhibbin Syah's view [16], the factors that affect learning achievement are divided into three parts, namely:

Internal factors

Factors that exist within themselves that can affect learning achievement, among others are physiological factors. Namely, strong physical health factors will provide benefits and good learning outcomes. On the other hand, unfavorable conditions will affect learning outcomes. In psychological factors that affect learning outcomes are divided into several parts, namely:

1. Intelligence, this factor prioritizes learning achievement depending on a person's IQ. Slameto said that "high intelligence levels will be more successful than those with low intelligence levels" [6].
2. Attention, is the activity of the soul that is heightened by the soul and even then it aims solely at an object or thing or a group of objects. Here the researcher takes the notion of attention is directed attention will produce a steady understanding and ability.
3. In interest, Slameto argues that interest is "a persistent tendency to pay attention and remember some activities, activities that are of interest to someone, to be paid attention to, accompanied by a sense of Dear". Researchers suggest that interest is a high desire for something that someone has [6].
4. Talent is the capacity to learn. In other words, talent is the ability to learn. From that assumption, talent is the ability, potential, and skill that a person has in welcoming the future.
5. Motivation is a person's encouragement in achieving the highest possible achievement.

External factors

Namely, factors that influence from outside a person. Factors that exist outside of themselves that can affect learning achievement, among others, are:

1. Social factors, which include social factors are: Family environment, school environment, and community environment.
2. Non-social factors, which include non-social factors are the condition and location of the school building, the condition and location of the family's house, learning tools and resources, weather conditions, and the study time used by students.

**Learning Approach Factors**

Factors that affect achievement in the teaching system such as methods, approaches, and strategies used in learning activities. and for more details and to make it easier to understand the researcher explains the schema of the relationship.

**Figures 1. Factors Affecting Learning Achievement**

**Hypothesis**

H1: Learning motivation affects student learning achievement  
H2: Computer Self Efficacy will affect Student Achievement  
H3: Learning Motivation, Self Efficacy have a joint effect on Student Achievement

**Figures 2. Conceptual Framework**
RESEARCH METHODS

Research Design

The research method is basically a scientific way to obtain data with a specific purpose and use. This type of research uses quantitative research methods. Quantitative methods are used when the problem which is the starting point of the research is clear, when the researcher wants to get extensive information from a population and when the researcher intends to test the research hypothesis. Data collection techniques in this study were carried out by observation and distributing questionnaires. The population in this study were students of the Faculty of Economics, University 17 Agustus 1945 Surabaya. The sampling technique used in this study was non-probability, more precisely the researchers used purposive sampling, with a sample of 100 students. The independent variables in this study are learning motivation and self-efficacy, while the dependent variable is learning achievement.

Data Analysis Technique

This study uses multiple regression, so in this study, the equation formula is as follows:

\[ Y = \alpha + \beta_1X_1 + \beta_2X_2 + e \]

Ket:
\[ \alpha \] = constant
\[ \beta_1, \beta_2, \] = Coefficient of variable X (independent variable)
\[ X_1, X_2, \] = Independent Variable

Variable Identification

In this study, several variables were used, including:

1. The dependent variable used is Learning Achievement (Y)
2. The independent variable used is Motivation (X₁), and Self-Efficacy (X₂)

Operational Definition & Measurement of Variables

Motivation

The five indicators used to measure Motivation variables are:

1. There is a desire and desire to succeed encouragement and a need for learning
2. Hopes and aspirations for the future
3. Appreciation in forwarding
4. Interesting activities in learning
5. Conducive learning environment
**Self-Efficacy**

There are seven indicators to measure the Self-Efficacy variable are:

1. Feel interested in answering questions that involve mathematical critical thinking.
2. Feel optimistic in answering questions that involve mathematical critical thinking.
3. Feel confident that you can answer questions that involve mathematical critical thinking.
4. Increase efforts to solve problems involving mathematical critical thinking.
5. Committed to solving problems involving mathematical critical thinking.
6. Respond to various situations and conditions positively.
7. Based on previous learning experiences

**Learning Achievement**

The three indicators used to measure lifestyle variables are:

1. Internal Factors:
   a. Physiological Factors:
      i. Body Health
   b. Psychological Factors:
      i. Intelligence
      ii. Attention
      iii. Interest

2. External Factors:
   a. Social Factors:
      i. Family environment
      ii. School environment
      iii. Community Environment
   b. Non-social Factors:
      i. House
      ii. School building
      iii. Learning tools and resources
      iv. Climate/weather

3. Learning Approach Factors:
   a. Study method
   b. Study strategy
RESULTS

Regression Analysis Test Results

Table 2. Regression Analysis Test

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>t</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
<td>Beta</td>
<td></td>
</tr>
<tr>
<td>I (Constant)</td>
<td>3.512</td>
<td>3.764</td>
<td>.933</td>
<td>.355</td>
</tr>
<tr>
<td>Motivation</td>
<td>.497</td>
<td>.126</td>
<td>.381</td>
<td>.000</td>
</tr>
<tr>
<td>Self Efficacy</td>
<td>.473</td>
<td>.105</td>
<td>.473</td>
<td>.000</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Learning Achievement (Y)

The Model of Multiple Linear Regression Equation which is produced is as follows:

\[ Y = 3.512 + 0.497 X_1 + 0.473 X_2 + e \]

The value of the constant on the \( Y \) variable shows the number 3.512, which means that the number states the magnitude of the learning achievement variable (\( Y \)). If Motivation (\( X_1 \)) and Self-Efficacy (\( X_2 \)) are constant, the amount of learning achievement (\( Y \)) is 3.512.

Motivation regression coefficient value (\( X_1 \)) shows several 0.497 which means that motivation (\( X_1 \)) has a positive influence on learning achievement (\( Y \)). If the Motivation variable (\( X_1 \)) increases by one unit, then Learning Achievement (\( Y \)) will increase by 0.497. Assuming that the other variables in this study are constant.

The regression coefficient value of Self-Efficacy (\( X_2 \)) shows several 0.473 which means that Self-Efficacy (\( X_2 \)) has a positive influence on Learning Achievement (\( Y \)). If the variable Self-Efficacy (\( X_2 \)) increases by one unit, then Learning Achievement (\( Y \)) will increase by 0.473. Assuming that the other variables in this study are constant.

Hypothesis test

Coefficient of Determination (\( R^2 \))

The value of the coefficient of determination or \( R^2 \) is used to measure how far the model's ability to explain the variation of the dependent variable or the dependent variable (\( Y \)), namely the learning achievement variable. The results of the SPSS calculation obtained a value of \( R^2 = 0.550 \), which means
that 55% of learning achievement can be explained by the motivation variable ($X_1$) and Self-Efficacy, ($X_2$), while the remaining 45% is influenced by other variables outside the model studied.

### Table 3. Coefficient of Determination Results ($R^2$)

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. The error in the Estimate</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.741°</td>
<td>.550</td>
<td>.524</td>
<td>2.078</td>
</tr>
</tbody>
</table>

a. Predictors: (Constant), Self Efficacy ($X_2$), Motivation ($X_1$)

### F test

The simultaneous test (F test) shows that all independent variables consisting of Motivation ($X_1$), Self-Efficacy ($X_2$), simultaneously affect the dependent variable Learning Achievement ($Y$).

### Table 4. Simultaneous Test

<table>
<thead>
<tr>
<th>Model</th>
<th>Sum of Squares</th>
<th>Df</th>
<th>Mean Square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Regression</td>
<td>279.404</td>
<td>2</td>
<td>93.135</td>
<td>21.570</td>
<td>.000°</td>
</tr>
<tr>
<td>Residual</td>
<td>228.842</td>
<td>53</td>
<td>4.318</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>508.246</td>
<td>56</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

a. Dependent Variable: Learning Achievement ($Y$)
b. Predictors: (Constant), Self Efficacy ($X_2$), Motivation ($X_1$)

Based on the table above, the significance value is 0.000 meaning < 0.05. This shows that $H_0$ is rejected and $H_1$ is accepted. So that the independent variables consisting of Motivation ($X_1$), Self-Efficacy ($X_2$), have a significant simultaneous effect on Learning Achievement ($Y$).

### t-test

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>B</td>
<td>Std. Error</td>
</tr>
<tr>
<td>1 (Constant)</td>
<td>3.512</td>
<td>3.764</td>
</tr>
<tr>
<td>Motivation</td>
<td>.487</td>
<td>.126</td>
</tr>
<tr>
<td>Self Efficacy</td>
<td>.473</td>
<td>.105</td>
</tr>
</tbody>
</table>

a. Dependent Variable: Learning Achievement ($Y$)
The t-test is used to determine whether or not there is an influence of each independent variable individually (partial) on the dependent variable with a significance level of 0.05. If the probability value of t is less than 0.05, then there is a partial effect of the independent variable on the dependent variable. In addition, it can also compare the t count with the t table. If the t count is greater than the t table, it can be said that the independent variable partially affects the dependent variable.

Looking at the SPSS output on the coefficients in the t-test above and comparing the t-count with the t-table of 1.674 obtained from the t-table with df = n-k (100-3) which is 97 and alpha 0.05.

1. Test the influence of Motivation ($X_1$) on Learning Achievement ($Y$)
   It is known that the significance value of 0.000 < 0.05, then the hypothesis $H_a$ is accepted, meaning that the motivation variable partially has a significant effect on learning achievement. It is known that $t_{\text{arithmetic}} = 3.934 > t_{\text{table}} = 1.674$, then $H_1$ is accepted, meaning that at a significance level of 5% the motivation variable ($X_1$) influences learning achievement, so the conclusion is that partially the motivation variable has a significant influence on learning achievement.

2. Test the effect of Self-Efficacy ($X_2$) on Learning Achievement ($Y$)
   Obtained a significance value of 0.000 < 0.05, then the hypothesis $H_a$ is accepted, meaning that the Self-Efficacy variable partially has a significant effect on learning achievement. It is known that $t_{\text{arithmetic}} = 4.517 > t_{\text{table}} = 1.674$, then $H_2$ is accepted meaning that at a significance level of 5% the variable Self-Efficacy ($X_1$) affects Learning Achievement, so the conclusion is that the Self-Efficacy variable partially has a significant effect on Learning Achievement.

3. Test the effect of Motivation ($X_1$), Self-Efficacy ($X_2$) on Learning Achievement ($Y$)
   Testing the influence of the variable Motivation ($X_1$), and Self-Efficacy ($X_2$) simultaneously on learning achievement. It can be seen from the results of the F test shows that the value of sig. in the F test of 0.000 which means less than 0.05 so that all independent variables consisting of Motivation ($X_1$), Self-Efficacy ($X_2$), simultaneously affect Learning Achievement ($Y$).

DISCUSSION

The Effect of Motivation on Learning Achievement

Based on the results of hypothesis testing the influence of motivation on learning achievement shows a sig value of 0.000 which means it is smaller than the value of 0.05. Thus, motivation has a significant effect on learning achievement, this means that the stronger the motivation, the higher the learning achievement will be. The motivation that supports and facilities connected to the internet affect learning achievement,
The Influence of Self-Efficacy on Learning Achievement

Based on the results of hypothesis testing the effect of Self-Efficacy on Learning Achievement shows a sig value of 0.000 which means it is smaller than the t-table value of 0.05. thus Self-Efficacy has a significant effect on Learning Achievement, this means that the stronger Self-Efficacy, the higher Learning Achievement will be. In other words, computer Self-Efficacy has a mediating role between Learning Motivation and Learning Achievement. Mediation Effects of Computer Self-Efficacy to determine whether there is a mediating effect of knowledge sharing.

The Effect of Simultaneous Motivation, Self-Efficacy on Learning Achievement

The results of the analysis in this study indicate that the variables Motivation (X₁), and Self-Efficacy (X₂), simultaneously have a significant effect on Learning Achievement (Y). It is known from the results of the F test which shows that the value of sig. in the F test of 0.000 which means less than 0.05 so that all independent variables consisting of Motivation (X₁), Self-Efficacy (X₂), simultaneously affect Learning Achievement (Y). thus the research hypothesis which reads "There is a significant influence of Motivation and Self-Efficacy simultaneously on Learning Achievement is proven true.

The value of the coefficient of determination or $R^2$ is used to measure how far the model's ability to explain the variation of the dependent variable (Y), namely the Learning Achievement variable. The results of the SPSS calculation obtained a value of $R^2 = 0.550$, which means that 55% of Learning Achievement can be explained by the variables Motivation (X₁), and Self-Efficacy (X₂), while the remaining 45% is influenced by other variables outside the model studied.

CONCLUSION

Research Results and Implications, First, learning motivation positively affects computer self-efficacy, which is consistent with the results of Pajares' (1996) research. This shows that students' learning motivation affects their attitudes toward online platform learning. The higher the motivation to learn, the more confident they are to complete online learning. Therefore, based on the online platform, the teacher must first improve student learning through motivation to enable students to meet learning objectives through the online platform. In addition, learning motivation and computer self-efficacy have a positive effect on learning effectiveness, and the results are consistent with Han (2008) and Chou (2006).

In other words, high learning motivation or individual confidence in the use of online platforms will result in outstanding learning performance. Therefore, to improve student learning effectiveness, teachers can improve their learning through computer motivation and self-efficacy, to help students succeed in learning and improve learning effectiveness.
This study found that learning motivation affects the effectiveness of student learning through computer self-efficacy. Since this aspect was not discussed in previous studies, it is the most valuable finding of this study. Regarding learning motivation, it can affect the effectiveness of learning with self-efficacy computers. Thus, teachers can increase the effectiveness of student learning through three pathways, namely, the direct effect of learning motivation or computer self-efficacy and the indirect effect through computer self-efficacy to increase learning motivation.

REFERENCES

