Unesa Journal of Chemical Education *ISSN: 2252-9454*
Vol. 3, No. 1, pp. 76-82, Januari 2014

THE RELATIONSHIP BETWEEN SELF-EFFICACY AND STUDENT LEARNING OUTCOMES IN TEACHING AND LEARNING PROCESS USING TANDUR STRATEGY ON REACTION RATE MATERIALS FOR THE CLASS XI IPA STUDENTS OF SMAN 1 TUBAN

Nurhalimah dan Kusumawati Dwiningsih
Chemistry Department, Mathematic and Science Faculty, State University of Surabaya
halimanur29@yahoo.com, Hp. 0856461844759

Abstrak

Tujuan dari penelitian ini adalah untuk mengetahui hubungan antara *self-efficacy* dengan hasil belajar siswa setelah penerapan pembelajaran menggunakan strategi TANDUR pada materi pokok laju reaksi. Desain penelitian yang digunakan dalam penelitian ini adalah *"One-Shot Case Study"*. Metode pengumpulan data yang digunakan dalam penelitian ini adalah metode angket yang digunakan untuk memperoleh informasi *self-efficacy* siswa dan metode tes untuk mengetahui hasil belajar siswa. Analisis penelitian yang digunakan adalah korelasi *product moment*. Data *self-efficacy* siswa sebagai variabel X dan hasil belajar sebagai variabel Y. Berdasarkan hasil analisis, harga r hitung sebesar 0,6932 lebih besar dari harga r-teoritik dengan N = 32 pada taraf signifikan 1% sebesar 0,449, sehingga H_0 ditolak dan Ha diterima. Sehingga dapat disimpulkan bahwa terdapat hubungan positif antara *self-efficacy* dengan hasil belajar siswa.
Kata kunci: *Self-efficacy*, Hasil belajar, Strategi TANDUR, Laju reaksi.

Abstract

The aim of this study is to know the relationship between self-efficacy and student learning outcomes after applied learning process using TANDUR strategy on reaction rate matter. The research design used in this research is "One-Shot Case Study". Methods of data collection in this research are questionnaire method used to obtain the information student's self-efficacy and test method to determine student's learning outcomes. Research analysis that used is product moment correlation. The data of student's self-efficacy is symbolized by X variable and learning outcomes as Y variable. Based on analysis result, r count rates 0,6932 is greates than t-theoritic with N = 32 at 1% significant level of 0,449, so H_0 is rejected and H_a accepted. It canbe concluded that there is positive correlation between self-efficacy and student learning outcomes.
Keyword : *Self-efficacy, Learning outcomes, TANDUR strategy, Reaction rate.*

INTRODUCTION

Chemistry is a clump of Natural Sciences. Chemistry subjects need to be teaching with the aims to provide students the knowledge, understanding of concepts, principles, laws, and theories of chemistry so that students can to solve problems in everyday life and technology.

Based on interviews with chemistry teachers of SMAN 1 Tuban, as long as the methods used in this learning is a conventional or a lecture. The result of the questionnaire showed that 67.86% of students want an explanation of material with relaxed it can be proven through the practice. 53.57% of students find difficulty to achieve of learning with optimal in main matter of reaction rate, and the average value classically in the main matter of reaction rate amounting to 55,11.

Lack of mastery concepts caused lack of students self-efficacy. This is a summary of questionnaire self-efficacy result. After calculation using a Likert scale analysis, the level of self-efficacy students of SMAN 1 Tuban Class XI IPA-

2 is as follows: 1. 60% is included in the catagory enough (students find difficulty to use the right strategies in completing tasks); 2. 62.86 % is included in the catagory enough (students easily give up when finding difficulties); 3. 65% is included in the catagory enough (students often not confident if competing with friends who are smarter); 4. 48.57% is included in the catagory enough (students can't to complete the task on time because of obstacles they taste). Therefore, done studies on self-efficacy.

Self-efficacy is the belief that determines how a person feels, thinks, motivate themselves, and behave [1]. Thus, self-efficacy is an effect on a person's success in achieving a goal. The higher self-efficacy, the higher challenging goals for themselves and their duty is their commitment [2]. Self-efficacy gives a lot of positive influence to growth in students.

According with Government Regulation No. 32 in 2013, passage 19 paragraph (1) of the Standard Process of Education, one of the criteria of good learning is learning which motivates learners are participatory, active, creative, effective, and fun. Learning should be fun (learning is fun), so they motivated to study hard by self without orders, and not feel overwhelmed or scared. Therefore, aspect of learning is fun an important aspect of learning [3]. Quantum teaching is specific instructions for creating an effective of learning environment, designing curriculum, deliver content and facilitate the learning process. Thus, quantum teaching can fulfill importance of student that description of material with relaxed then proven through practice, according with the Standard Process of Education, as well as to improve student's self-efficacy. Stages quantum teaching is TANDUR. The acronym of TANDUR are "Tumbuhkan" (Growing), "Alami" (Natural), "Namai" (Rename), "Demonstrasikan" (Demonstrate), "Ulangi" (Repeat), "Rayakan" (Celebrate).

Growing is the stage to create the capability to understand what he learned with each other. Growing interest by satisfying "Has Benefits For me" (AMBAK "Apa Manfaat Bagi Ku"), the benefits for students in everyday life [4].

Natural is the stage where teachers create or bring a common experience that can be understood by all students [4]. The material will be more easily to understand if it is connected with the student experience and using term that easy to understand for student.

Rename is the stage where the teacher gives the concept of the material being studied. Provide keywords, concepts, models, formulas, strategies: an "suggestion".

Demonstrate a step providing opportunities for students to "show that they know" [4]. From some experiments, finally success can be achieved and will get a meaningful experience.

Repeat is a step that growing a sense of "I know that I know it" [4]. Everyone was pleased to be recognized [4]. Receiving recognition makes us feel proud, confident, and happy.

On Celebrate stage giving a sense of respect, and appreciate the efforts of the student. The celebration will strengthen the sense of responsibility on their selves and initiate their own learning process [4]. Thus, students will be more confident and motivated to follow teaching and learning activities in the classroom. The celebration can be a compliment, applause, and surprises.

Based on the background above, it can be stretched formulation of problem " What is the relationship between self-efficacy and student's learning outcomes in teaching and learning process using TANDUR strategy on reaction rate materials for the class XI IPA students of SMAN 1 Tuban?".

Based on the formulation of the problem, the aim of this study is to know the relationship between self-efficacy and

 ISSN: 2252-9454

student learning outcomes after applied learning process using TANDUR strategy.

The advantage of this research is to provide an alternative learning can increase self-efficacy for students, so students more motivated to participate in learning process.

METHOD

Type of research used in this research is pre-experimental or quasi-experimental research, because this research uses only one class without control class. Samples in This research is XI IPA-6 SMAN 1 Tuban is determined randomly.

The research design used in this research is the "One-Shot Case Study" can be described as follows:

X	**O**

Description:

X : The given treatments is learning process using TANDUR strategy on materials of reaction rate as well as develop self-efficacy of students during the learning process.

O : Giving the final test (post-test) to known student's learning outcomes on materials of reaction rate after applied learning process using TANDUR strategy.

Learning instrument in this research include self-efficacy questionnaire and achievement test (post-test).

Methods of data collection in this research are questionnaire method used to obtain the information student's self-efficacy and test method to determine student's learning outcomes.

The technique of data analysis in this research are descriptive quantitative means analysis of the questionnaire of student self-efficacy, analysis of student's learning outcomes, and analysis relationships of self-efficacy with student's learning outcomes.

Scales used in instrument of self-efficacy using a Likert scale with four possible answers in each item that is VA (Very Appropriate), A (Appropriate), NA (Not Appropriate), VNA (Very Not Appropriate).

Scoring used on instruments self-efficacy is directly. For items that belong to the positive items, the scores given to the category VA = 4, A = 3, NA = 2, and VNA = 1. As for the items that belong to the negative items, the score given is VA = 1, A = 2, NA = 3, and VNA = 1. Scores are obtained from each state in both of those criteria, then find the value of self-efficacy are owned by the students with the formula:

$$\text{Value of self-efficacy} = \frac{Score\ obtained\ by\ student}{Maximum\ score} \text{ x } 100\%$$

The percentage indicates the value of self-efficacy of students with the following assessment categories:

Table 1. Assessment Rubric of Student's Self-efficacy

Score	Criteria
0,0%-20,0%	Very weak
20,1%-40,0%	Weak
40,1%-60,0%	Enough
60,1%-80,0%	Strong
80,1%-100,0%	Very Strong

[5]

Data of Student's learning outcomes obtained from the results of the post-test at the end of the lesson using strategies TANDUR. Calculation of student's learning outcomes can use the following formula :

$$\text{Student's value} = \frac{\Sigma B}{N} X\ 100$$

Then for completeness classically obtained by the formula:

$$\text{Classical Mastery} = \frac{\Sigma\ Students\ mastery}{\Sigma\ One\ class\ students} \text{ x } 100\%$$

To determine the relationship between self-efficacy with student's learning outcomes, the data are analyzed using product moment correlation. Degree of relationship will be expressed by r (correlation coefficient) [6]. The formula

used to calculate the correlation coefficient:

$$r = \frac{\Sigma xy}{\sqrt{\Sigma x^2 y^2}}$$

Description:

x = The value of self-efficacy

y = The value of student's learning outcomes

rxy = Correlation between variables x with y

x = (xi – $\bar{x}$)

y = (yi – $\bar{y}$)

RESULT OF RESEARCH

Data of student's self-efficacy

The value of student's self-efficacy of class XI IPA-6 assessed by questionnaire self-efficacy. Questions in the questionnaire includes four aspects of self-efficacy are as follows:

1. Aspects of confidence based on dealing with uncertain situations that contain elements of ambiguity, unpredictability, and stressful.
2. Aspects of confidence based on mobilizing the motivation, cognitive ability, and perform the necessary actions to achieve the goal.
3. Aspects confidence reaches a specified target.
4. Aspects of confidence based on coping with problems that arise.

Each aspect is represented some positive or negative questions. The value of self-efficacy XI IPA-6 students of SMAN 1 Tuban based on the results of the questionnaire are as follows:

Table 2. Value Questionnaire Self–efficacy of Students

No.	Name	Value of *Self-efficacy* (%)	category
1	A I A	90,00	VS
2	A N K	66,67	S
3	A M I N	83,33	VS
4	A K P	88,33	VS
5	A R S H	96,67	VS
6	A R A	81,67	VS
7	A A	83,33	VS
8	A K H R	81,67	VS
9	A A D	86,67	VS
10	D	91,67	VS
11	D M	78,33	S
12	E N H	83,33	VS
13	E M K	80,00	S
14	F N P	80,00	S
15	F W B	88,33	VS
16	F U N	86,67	VS
17	K V S	91,67	VS
18	K A N S	86,67	VS
19	K S P	86,67	VS
20	M N I	65,00	S
21	M D P L	80,00	S
22	P S N P	80,00	S
23	R N H	81,67	VS
24	R D S	75,00	S
25	R P P	81,67	VS
26	R A W	63,33	S
27	R S	78,33	S
28	R F	80,00	S
29	S I	83,33	VS
30	T D C	75,00	S
31	V S N	81,67	VS
32	L N S	80,00	S
The average value of *self-efficacy* (%)			81,77

Description:

0,0%-20,0% : Very Weak (VW)
20,1%-40,0% : Weak (W)
40,1%-60,0% : Enoug (E)
60,1%-80,0% : Strong (S)
80,1%-100,0% : Very Strong (VS)

Based on Table 1, the average value of self-efficacy XI IPA-6 students of SMAN 1 Tuban applied learning using strategy TANDUR is 81.77% on very strong category. This suggest that learning use effective strategies TANDUR growing student's self-efficacy.

Data of student's learning outcomes

Learning outcome is the value of the post-test conducted at the end of the learning process using TANDUR strategy

on materials of reaction rate. Student's learning outcomes data in learning process using TANDUR strategy can be seen in Table 3 below.

Table 3. Value of post-test

No.	Name	Value of *Post-test*	M/NM
1	A I A	100	M
2	A N K	90	M
3	A M I N	95	M
4	A K P	95	M
5	A R S H	100	M
6	A R A	95	M
7	A A	100	M
8	A K H R	95	M
9	A A D	100	M
10	D	100	M
11	D M	85	M
12	E N H	92	M
13	E M K	82	M
14	F N P	86	M
15	F W B	95	M
16	F U N	95	M
17	K V S	95	M
18	K A N S	95	M
19	K S P	100	M
20	M N I	87	M
21	M D P L	93	M
22	P S N P	84	M
23	R N H	92	M
24	R D S	80	M
25	R P P	100	M
26	R A W	77	NM
27	R S	90	M
28	R F	80	M
29	S I	95	M
30	T D C	90	M
31	V S N	90	M
32	L N S	95	M
The average value		92,13	

Description:
M : Mastery
NM : Not Mastery

Students can to be successful in learning process if the value of Basic Competency that achieved are ≥ 0.80 or 80% individually and classically and achieve the minimum mastery criteria if ≥ 80. Based on Table 3, a total of students that achieve of minimum mastery criteria are 31 students and 1 student did not achieve of minimum mastery criteria. Thus the percentage of the learning outcomes classically after the implementation of the TANDUR strategy in the main matter of reaction rate is 96.88% students is mastery and 3.12% student not mastery. Thus, students can to be successful in the learning process.

The relationship between self-efficacy and student's learning outcomes and explanation

The relationship between self-efficacy and students learning outcomes obtained through data analysis of questionnaire self-efficacy with the value of student's post-test. The degree of relationship between self-efficacy and result of learning will be expressed by r (correlation coefficient).

Data self-efficacy of students as a variable X, and data of student learning outcomes as variable Y. Based on the analysis result, r count rates 0.6932 is greater than r-theoretical with N = 32 at 1% significant level of 0.449, so H_0 is rejected and Ha accepted. It can be concluded that there is a positive correlation between self-efficacy student's learning outcomes. A positive correlation shows that higher of student's self-efficacy also higher student's learning outcomes will achieve, as well as conversely. Coefficient data obtained in the sample reflect the population.

The size of the contribution of self-efficacy on student's learning outcomes can be determined by calculating the coefficient of determination. The coefficient of determination is quadrate of the correlation coefficient (r^2). Based on the calculation of the coefficient of determination, amounting to 48.0526% of self-efficacy contributes to student's learning outcomes and 51.9474% by other factors, such as environmental factors, instrumental factors (teaching and learning

 ISSN: 2252-9454

process using TANDUR strategy), student intelligence (IQ), attention and interest of students, motivation, physiologicall of students condition and others [7]. Contributions of self-efficacy on student's learning outcomes can be made pie chart below:

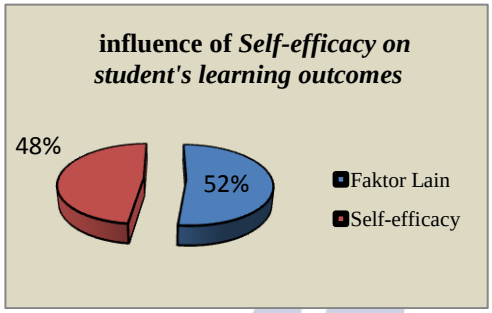

Figure 1. Diagram of the influence of self-efficacy on stedent's learning outcomes

Although the power of relationship between self-efficacy with student's learning outcomes known by the interpretation of correlation coefficient. Based on the interpretation correlation coefficient, r = 0.6932 at strong level of relationship. Therefore, the relationship between self-efficacy with student's learning outcomes class XI IPA-6 studets of SMAN 1 Tuban in 2013-2014 school year is strong. The next test result further reinforced by looking at the correlation match between the level of student's self-efficacy with the level of student learning outcomes will achieve.

The results of matches between the level of self-efficacy with student's learning outcomes that achieve, showed that students who have a very strong tend to achieve higher learning outcomes are as much as 59.38%, while students who have strong result of learning achieved as many as 16,13% categories of high, medium as many 21.88%, and 3.12% lower. According the results of these research, the higher self-efficacy of student's, the higher student's learning outcomes that achieved, as well as conversely. Even though, there are some students who are less suitable between self-efficacy with student's learning outcomes that achieved, so the match between self-efficacy with studen's learning outcomes that achieved be disseminated at different levels.

Self-efficacy influence four main processes of cognitive processs, motivational, affective, and selection [1]. The relationship between self-efficacy with student's learning outcomes occurs because of self-efficacy influence cognitive processes and student's motivation. Cognitive process is a process of thinking, including the acquisition, organization, and using information. Students who have high self-efficacy will perceive their ability it will increasingly shape efforts in achieving the goal and stronger commitment of students. Student's motivation is raised through cognitive processes. Thus self-efficacy is very necessary to improve student motivation to achieve high student's learning outcomes. Student's self-efficacy occur by several factors, including enactive mastery experience, vicarious experience, verbal persuasion, and physiological state [1]. Experience and psychological conditions of students will be processed by the self system refers to the cognitive system to do interpretation, resulting a strategy to achieve the goal. Indirectly experience and student's psychological condition affects the level of student's self-efficacy. Without a high self-efficacy all plans can not be realized well. Students who have high self-efficacy tend to have more control over events in their environment, so that they feel more sure [8]. The higher students self-efficacy, the higher goals to be achieved, and feel confident and certain in action. Thus, enactive mastery experience, vicarious experience, verbal persuasion, and physiological state of students will affect the level of student's self-efficacy.

CLOSING

Conclusion

Based on analysis result, r count rates 0,6932 is greates than t-theoritic with N = 32 at 1% significant level of 0,449, so H_0

ISSN: 2252-9454

is rejected and Ha accepted. It canbe concluded that there is positive correlation between self-efficacy and student learning outcomes after the implementation of TANDUR strategy in the learning on materials of reaction rate. This shows that the higher student's self-efficacy, the higher student's learning outcomes are achieved, as well as conversely the lower self-efficacy of students, the lower student's learning outcomes that achieved.

Suggestion

1. In this research, only the cognitive aspects to be considered at the end of learning process without pay attention the process. In the next research is expected not only pay attention to the final outcome, but also pay attention to the process.
2. The implementation of TANDUR strategy strategy in the learning on materials of reaction rate effective for growing students' self-efficacy, thus needs to be applied to other chemistry materials which have characteristics matched to the TANDUR strategy.
3. After the implementation of TANDUR strategy, self-efficacy contributes to student's learning outcomes, so it can be developed more extensive to investigate the students' motivation in learning, student activity, attention and interest of students, the ability students in communication, intelligence, as well as the retention power of students.

BIBLIOGRAPHY

1. Bandura, A. 1994. Self-efficacy. Encyclopedia of human Behavior, Vol. 4, pp. 71-81. *http://www.des.emory.edu/mfp/Bandura1994EHB.pdf. Diakses pada tanggal 9 Maret 2013.*
2. Bandura, A. 1993. Perceived Self-Efficacy in Cognitive Development and Functioning. *Educational Psychologist*, 28 (2), pp. 117-148. *http://www.centerforefficacyandresiliency.org/assets/docs/Perceived%20Self Efficacy%20in%20Cognitive%20Development%20and%20Functioning.pdf. Diakses pada tanggal 9 Maret 2013.*
3. Rusman. 2012. *Model-Model Pembelajaran: Mengembangkan Profesionalisme Guru*. Edisi kedua. Jakarta: Rajawali Pers.
4. DePorter, Bobbi., Reardon, Mark., Nourie, Sarah Singer. Mike Hernacki (Ed). 2008. *Quantum Teaching: Mempraktikkan Quantum Learning di Ruang-ruang Kelas.* Penerjemah Ary Nilan dari. Bandung: Kaifa.
5. Riduwan. 2011. *Skala Pengukuran Variabel-variabel Penelitian*. Bandung: Alfabeta.
6. Sugiyono. 2012. *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta.
7. Rusman. 2012. *Belajar dan Pembelajaran Berbasis Komputer Mengembangkan Profesionalisme Guru Abad 21*. Bandung: Alfabeta.
8. Hergenhahn, B.R. dan Olson, Matthew H. 2008. *Theories of Learning*. Edisi ketujuh. Penerjemah Triwibowo B.S. Jakarta: Kencana Prenada Media Group.