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Preface

The 2nd ICIEVE 2017, the International Conference on Innovation in Engineering and Vocational Education, held on October 25-26, 2017 at Aryaduta Hotel, Manado, North, Sulawesi, Indonesia, is hosted by Universitas Pendidikan Indonesia (Indonesia), Universitas Negeri Manado (Indonesia), and Rajamangala University of Technology Thanyaburi (Thailand).

The conference was a platform for scientists, scholars, engineers, industrial professionals, and researchers to exchange, share, and discuss their innovation, experiences, research works and problem solving techniques in all issues in engineering and vocational education.

The participants of ICIEVE 2017 were from around the world with a variety of background, including academics, industry, and even well-known enterprise. In general, there were 140 papers discussing such various topics as engineering and technology innovation (mechanical engineering, chemical engineering, civil engineering, etc.), engineering education (basic science in engineering education, engineering education reforms, new technologies in education, etc.), and vocational education and training (industry-driven training programs and collaborations, lifelong learning – reskilling and upskilling, government and policy, etc.).

We would like to thank all of those who helped and supported ICIEVE 2017. Each individual and institution's support was very important for the success of this conference. Specifically, we would like to acknowledge the advisory board, scientific committee, and organizing committee for their valuable advice, help, suggestions, and support in the organization and helpful peer-reviewing process of the papers. This year, we would like to express our deepest gratitude for all the co-hosts of ICIEVE 2017, UNIMA, Indonesia, and Rajamangala University of Technology Thanyaburi, Thailand for the collaboration. We would also extend our best gratitude to keynote speakers for their valuable contribution for sharing ideas and knowledge in the ICIEVE 2017.

We sincerely hope that ICIEVE 2017 will be a forum for excellent discussions for improving the quality of research and development in relation to innovation in engineering and vocational education. We also hope that this forum will put forward new ideas and promote collaborative researches among participants. We believe that the proceedings can serve as an important research source of reference and the knowledge. Indeed, the proceedings will lead to not only scientific and engineering progress but also other new products and processes for better science and technology in vocational education.

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Teaching Quality and Learning Creativity in Technical and Vocational Schools

D R E Kembuan, P T D Rompas, M Mintjelungan, T Pantondate, and B M H Kilis

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Abstract. The purpose of this study is to obtain information about the teacher quality of teaching and learning creativity with the outcomes of student learning in a vocational high school in Indonesia. This research is a survey research. The sample used in this research is 50 teachers, selected by simple random sampling. Data were analyzed by using correlation analysis. The findings of this study are as follows: (1) There is a significant and positive correlation between teacher quality of teaching with the outcomes of student learning at the vocational high school; (2) There is a significant and positive correlation between learning creativity with the outcomes of student learning at the vocational high school, and (3) there is a significant and positive correlation between the teacher quality of teaching and learning creativity with the outcomes of student learning at the school. That is, if the use of appropriate the teacher quality of teaching and learning creativity, then the outcomes of student learning at the school. Finally it can be concluded that to improve the outcomes of student learning, it has to be followed by an improvement of teacher quality of teaching and learning creativity.

1. Introduction

Education is the process of carrying out a conscious effort to change the knowledge, attitude, and equip one's or group's skills through the interaction of learning to make an individual fit with his or her social life and to help pass on the habits, laws, beliefs, languages and institutions Social institutions from one generation to the next.

Law of the Republic of Indonesia No. 20 of 2003 on the National Education System, namely that the national education aims to develop the potential of learners to become human beings who believe and cautious to God Almighty, noble, healthy knowledgeable, capable, creative, independent and become citizens of a democratic and to be responsible.

The main objective to be achieved by every educational institution, especially formal education is to produce graduates who excel. Achievements in question is the achievements generated through the learning process. The expectation of a good learning achievement is of course supported by the quality of teachers that are teachers who have social competence and professional competence.

At the senior high school level, the problem of learning outcomes is very important to be able to continue in the next education, but in reality there are still vocational graduates who lack the ability in the field of science, consequently adjustments in education level many experiencing problems, especially the Related to the adjustment with the lesson. Increased student learning outcomes is a process that must be continuous in every aspect that shapes the overall service of education.

Improvement of student learning outcomes as a result of educational process can not only be done by one or more aspects only and at one particular period only, but must be done systemically, continuously, and done by all elements.

Based on the researcher's observation of SMK, many of the teachers who pay less attention to the elements of teaching quality, such as the quality of teaching teachers, students' learning creativity, the implementation of learning activities, teaching evaluation, the use of instructional media that less support the smooth learning process, and the use of teaching methods Inefficient, and effective. This results in less satisfactory learning outcomes.

The role of the teacher in the learning process strongly determine the success of students in learning. In the context of academic learning, creativity can be thought of as occurring at both a subjective (creativity as part of the act of learning) and an intersubjective (learning as a creative act) level [1]. At the subjective level, students exercise their creativity by developing new and personally meaningful ideas, insights, and understandings within the context of particular academic constraints. Thus the role of teachers in the learning process is crucial to student learning outcomes.

The elements that affect the quality of teaching teachers according to Miller are the experience of teaching teachers and professionalism [2]. Both of these elements can affect the quality of teachers, according to him that the more experienced teachers in carrying out their duties as teachers, the more professional qualifications are adequate. While the quality of teacher professionalism can be improved through teacher education.

Darling states that in the effort to realize the quality of teaching teachers, it is necessary to pay attention to several factors such as teachers must meet professional standards by selecting prospective teachers, the level of good school accreditation, the knowledge and skills of teachers who continue to be improved [3]. In an effort to improve student learning outcomes required creativity of learning and creativity of student learning.

Both factors are important in the effort to improve student learning outcomes through learning activities. A "value-added" assessment of the degree to which teachers who are already in the classroom contribute to their students' learning, as indicated by higher-than-predicted increases in student achievement scores [4].

Student learning creativity is a process that is reflected in fluency, regularity, and originality in thinking. In learning activities, student learning creativity plays an important role, because thanks to the creativity of learning, step by step to make the world of education more advanced. Creativity is yet another student characteristic that shares a conceptual, albeit equivocal, link with academic achievement. As we have discussed, researchers have reported associations that are relatively strong [5].

In general, the process of thinking trained in schools is limited to cognition, memory, and convergent thinking, whereas divergent thinking and evaluation are overlooked. Divergent thinking is to provide a variety of possible options for solving problems based on the information provided, with an emphasis on diversity and suitability. According to Lampe, that learning creativity is important that support student achievement. Creative students are students who have the ability to work with others in learning [6]. It can support the achievement of learning achievement in accordance with the purpose of learning. Khalid argued that in the learning activities, teachers are required to understand the creativity of student learning, by understanding the creativity of student learning, facilitate teachers to apply appropriate and strategic teaching approach in accordance with student learning needs.

Davies (1981: 246) states, learning outcomes are not the same as performance, learning outcomes involve acquiring knowledge, skills or attitudes while performance concerns the use of demonstrated knowledge, skills and attitudes that can show that a person has indeed mastered them accordingly with predetermined standards as a result of its learning [7]. Learning outcomes are the abilities students have after they have received their learning experience. Learning outcomes is a person's maximum performance in mastering materials or materials that have been taught or have been studied.

The research hypothesis consists of 3 (three) as follows: 1) There is a positive relationship between the quality of teaching teachers with the results of student learning SMK Negeri 2 Manado, 2) There is

a positive relationship between student learning creativity with student learning outcomes SMK Negeri 2 Manado, 3) A positive relationship between the quality of teachers teaching, and creativity of learning with student learning outcomes SMK Negeri 2 Manado.

2. Method

This research was conducted in SMK Negeri 2 Manado, and implemented three months, beginning in March 2016 and is expected to be completed in May 2016. This research use survey method with correlation analysis technique. In this study the population is all students of SMK Negeri 2 Manado a number of 98 students, 50 teachers were selected randomly as the sample. Data collection techniques were conducted using questionnaire-shaped research instruments. Testing of the instrument includes validity test (validity) and reliability test (reliability). From the test results obtained valid and invalid instrument items. Invalid instrument removed. Instruments to be used to obtain research data, conducted by using the five scale questionnaire. Instruments are based on the theories used. Questionnaires were distributed to teachers who became respondents in this study. Questionnaires are used to obtain research data as described below.

3. Results

To test the correlation between teacher teaching quality (X_1), and learning creativity (X2) with student learning result of SMK Negeri 2 Manado (Y), either individually or jointly, hypothesis testing with analytical technique: (1) Simple correlation; (2) double correlation. The results of testing the research hypothesis are as follows:

3.1. The correlation of teacher teaching quality (X_1) with student learning outcomes SMK Negeri 2 Manado (Y)

The first hypothesis proposed states that there is a positive correlation between teacher teaching quality variables (X1) with student learning outcomes SMK Negeri 2 Manado (Y). To know the correlation is used simple correlation analysis between X1 with Y or ry1. The result of regression significance test showed that Fh = 9,548> F (0,01; 1/48) = 7,12 and result of regression linearity test showed Fh = 0.848 <Ft (0,05,29/19) = 4.04, Student learning SMK Negeri 2 Manado (Y) for teacher teaching quality (X1) is very significant and their correlation is linear. Thus, the quality of teaching teachers is one predictor of student learning outcomes SMK Negeri 2 Manado.

The strength of the correlation between the qualities of teaching teachers with student learning outcomes SMK Negeri 2 Manado can be shown by the correlation coefficient ry1 of 0.771. The result of significance test of correlation coefficient shows that the correlation between teacher teaching quality (X1) with student learning result variable of SMK Negeri 2 Manado (Y) is positive and very significant, in other words the higher the quality of teaching the student teacher, the better the student learning outcomes. Thus, it receives the first hypothesis which states: "there is a positive correlation between teacher teaching qualities (X1) with the variable of student learning outcomes of SMK Negeri 2 Manado (Y)." The coefficient of determination of 0.594 shows that 59.4% Learning student of SMK Negeri 2 Manado, explained by teacher teaching quality through regression equation line $\hat{y}$ = 22,824 + 0,779X1.

3.2. The correlation of learning creativity (X2) with student learning outcomes SMK Negeri 2 Manado (Y).

The second hypothesis proposed states there is a positive correlation between learning creativity (X_2) with the variable of student learning outcomes SMK Negeri 2 Manado (Y). To know the correlation is used simple regression analysis. The linearity results show that the null hypothesis is accepted and the alternative hypothesis is rejected, since Fh = 0.919 <Ft (0.05; 22/26) = 2.07. Thus it can be concluded that the regression equation Y = 18.720 + 0.405X2 is linear. It means that every increase of one score creativity of learning will lead to increase student learning outcomes SMK Negeri 2 Manado of 0.405 at Constanta 18.720. The strength of the correlation between learning creativity (X_2) and student

learning outcomes SMK Negeri 2 Manado (Y) can be shown by the correlation coefficient ry_2 of 0.407.

The test results show that the correlation between learning creativity (X_2) and student learning outcomes of SMK Negeri 2 Manado (Y) are positive and very significant. That is, the better the quality of teaching teachers the higher the results of student learning SMK Negeri 2 Manado. Coefficient of determination (ry_2) 2 = 0,166 shows that 16,6% variance that happened in student learning result of SMK Negeri 2 Manado can be explained through student's learning creativity. Thus the second hypothesis that states: "there is a positive correlation between learning creativity with student learning outcomes SMK Negeri 2 Manado is accepted".

3.3. The correlation between the quality of teaching teachers, and creativity of learning together with student learning outcomes SMK Negeri 2 Manado.

The third hypothesis proposed is: there is a positive correlation between teacher teaching quality, and creativity of learning with student learning outcomes SMK Negeri 2 Manado. To know the existence of correlation together between the three independent variables with the dependent variable, used multiple regression. From regression and multiple correlation test results obtained by multiple regression equation shown by equation $\hat{Y} = 25,412 + 0,757X1 + 0,045X2$.

To know the degree of significance of the equation of multiple regression lines, then tested F, the result is as follows: The result of regression significance test is Fh = 34,599> F (0.01; 2/47) = 7,271. This shows that regression of student learning result of SMK Negeri 2 Manado (Y) for teacher teaching quality (X1), and creativity of learning (X2) is very significant. This means the quality of teaching teachers, and creativity of learning together are predictors of student learning outcomes SMK Negeri 2 Manado. Regression equation $\hat{Y} = 25,412 + 0,757X1 + 0,045X2$ shows that everyone score increase on teacher quality teaching quality, and quality of teaching teacher together, can cause increase of learning result of student of SMK Negeri 2 Manado. The strength of the correlation between these variables is indicated by the double correlation coefficient of 0.822. Significant test of correlation coefficient, as follows: Duality Test of Coefficient of Double Correlation of teacher teaching quality (X1), and creativity of learning (X2) together with student learning outcomes SMK Negeri 2 Manado (Y)

The test results show that the correlation between teacher teaching quality, and creativity of learning together are positive and very significant, with the coefficient of determination of 0.676. These findings indicate that the higher the quality of teaching teachers, and creativity of learning together, it will also increase student learning outcomes SMK Negeri 2 Manado, 67.6% variance that occurs in the learning outcomes of students SMK Negeri 2 Manado, described together Equals by variable X1 and X2 through regression line equation $\hat{Y} = 25,412 + 0,757X1 + 0,045X2$.

4. Conclusions

Testing of proposed research hypothesis proved that teacher quality teaching quality (X1), creativity of learning (X2), both individually and jointly have positive and significant relation with learning result of SMK Negeri 2 Manado (Y) students.

First, the correlation coefficient between the qualities of teaching teachers with the learning outcomes Students SMK Negeri 2 Manado is equal to 0.771. This shows that the quality of teaching teachers can contribute to improve learning outcomes Students SMK Negeri 2 Manado 59.4%. With a large contribution of teacher quality teaching quality to the learning outcomes Students SMK Negeri 2 Manado is equal to 59.44%.

Second, the correlation coefficient between learning creativity and learning outcomes Student SMK Negeri 2 Manado is equal to 0.407. This shows that the creativity of learning also contributes high enough to increase the learning outcomes of students of SMK Negeri 2 Manado is 16.6%. With a large, variable contribution of learning creativity to learning outcomes Student SMK Negeri 2 Manado is 16.6%.

Third, the result of correlation and multiple regression on self-control, and creativity of learning together with consumer Satisfaction obtained a large correlation coefficient of 0.822 or 67.6% contribution that occurs in the learning outcomes Student SMK Negeri 2 Manado can be explained together Through teacher teaching quality and learning creativity condition through regression equation $\hat{Y} = 25{,}412 + 0{,}757X1 + 0{,}045X2$.

Based on the result of the research, there are some suggestions that can be stated concerning the learning outcomes of SMK Negeri 2 Manado for the quality of teaching teachers, the creativity of learning as follows: 1) School parties need to encourage teachers, especially students to improve competitive and competitive learning achievement and utilize (2) Schools need to work with parents to manage or monitor the activities of students, whether at school or at home, 3) Students need to pay attention to the interests needed in achieving learning achievement to provide convenience when faced with the problem- (4) Shiva needs to change behavior that is ugly or less acceptable to teachers and classmates, 5) Research study can be applied in other learning, 6) The author suggests research on the same topic but the object is the vocational school.

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