

# THE EFFECT OF SELF-EFFICACY AND EMOTIONAL INTELLIGENCE ON PROJECT-BASED LEARNING IN VOCATIONAL EDUCATION

*Pengaruh Efikasi Diri dan Kecerdasan Emosional terhadap Kualitas Hasil Produk Pembelajaran Berbasis Proyek pada Pendidikan Vokasional*

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## INFORMASI ARTIKEL

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## ABSTRACT:

### Keywords:

*Project-Based Learning, Self-Efficacy, Emotional Intelligence*

### Kata kunci:

*Project-based learning does not only require hard skills, but requires a balance of soft skills and student self-development. This study aims to analyze how much influence self-efficacy and emotional intelligence have on the quality of product outcomes in project-based learning and analyze the determinant factors. A total of 228 vocational education students were involved in this study. Data were collected through questionnaires measuring self-efficacy and emotional intelligence, and product evaluation observation sheets. Data were analyzed using multiple linear regression analysis and confirmatory factor analysis. The results showed that self-efficacy and emotional intelligence had a significant effect on the quality of students' products. The level of experience, social skills, and quality of materials are*

Pembelajaran berbasis proyek, Efikasi diri, Kecerdasan Emosional

*the determinants of each variable. Various student self-development efforts to foster self-efficacy are very important to do to improve product quality. In addition to strengthening students' emotional intelligence, it is also very important to improve the quality of project-based learning outcomes.*

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**ABSTRAK:**

Pembelajaran berbasis proyek tidak hanya membutuhkan keterampilan keras, tetapi membutuhkan keseimbangan soft skill dan pengembangan diri siswa. Studi ini bertujuan untuk menganalisis seberapa besar pengaruh self-efficacy dan kecerdasan emosional terhadap kualitas hasil produk dalam pembelajaran berbasis proyek dan menganalisis faktor penentu. Sebanyak 228 siswa pendidikan kejuruan terlibat dalam penelitian ini. Data dikumpulkan melalui kuesioner yang mengukur self-efficacy dan kecerdasan emosional, dan lembar pengamatan evaluasi produk. Data dianalisis menggunakan analisis regresi linier berganda dan analisis faktor konfirmasi. Hasil penelitian menunjukkan bahwa self-efficacy dan kecerdasan emosional memiliki efek yang signifikan pada kualitas produk siswa. Tingkat pengalaman, keterampilan sosial, dan kualitas bahan adalah penentu dari setiap variabel. Berbagai upaya pengembangan diri siswa untuk menumbuhkan self-efficacy sangat penting dilakukan untuk meningkatkan kualitas produk. Selain memperkuat kecerdasan emosional siswa, juga sangat penting untuk meningkatkan kualitas hasil pembelajaran berbasis proyek.

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**INTRODUCTION**

During the development of science and technology in the 21st century in the field of education, various learning innovations have been introduced to meet the competency needs of the century (Trilling & Fadel, 2009). Various 21st century-based technologies have

begun to be integrated in learning as a response to the challenges and opportunities that are currently happening (Chai & Kong, 2017). In addition, various models, media and learning resources have also been applied and developed to support the 21st century-based learning process (Hussin et al., 2019). One of the learning models that are widely

applied today is project-based learning. Project-based learning is considered capable of improving 21st century skills (Guo et al., 2020). Independent learning, motivation and collaboration can be improved through this learning model (Yilmaz et al., 2020). In addition, learning that is oriented to the creation of a work or project can increase creativity and critical thinking skills (Safaruddin et al., 2020; Setyarini & Jannah, 2020).

Project-based learning models are widely applied in vocational education. The number of practical learning objectives that can be achieved through this model is the basic reason for its application in vocational education (Dogara et al., 2019; Haryanto et al., 2021; Lizunkov et al., 2020). In addition, the characteristics of hands-on learning in vocational education are a strong reason for implementing a project-based learning model (Nayak et al., 2021). Information gathering, active learning, full involvement in the learning process to obtain mature results are important links to project-based learning (Astuti et al., 2021). Various project-based learning models have been developed to match the characteristics of learning outcomes. In addition, several developments of the model were also carried out to improve the less than optimal syntaxes (Tsai et al., 2019).

A fundamental aspect that is very important in project-based learning is the quality of the products produced in the learning (Nakada et

al., 2017). The product quality of the project results is an important indicator in the successful implementation of project-based learning (Joo et al., 2019). The high and low quality of the resulting product also indicates that the learning process is less than optimal (Guo et al., 2020). Especially in the context of vocational learning whose products are dominated by finished products in the form of ready-to-use goods (Nilsook et al., 2021). Thus, the quality of student product outcomes in project-based learning is very important for vocational education to pay attention to, especially the teaching staff. Various efforts have been made to maximize the quality of the resulting learning products (Wan et al., 2020). The integration of media and learning resources to support the quality of project-based learning outcomes continues to be carried out (Wahyu H et al., 2021). However, this effort is inversely proportional to the reality that occurs, namely the low quality of products resulting from project-based learning (Ngereja et al., 2020).

Project-based learning outcomes for vocational education students tend to be still not optimal (Mutohhari et al., 2021; Sadrina et al., 2018). This was also found directly in the field during observations in several majors, namely automotive engineering, mechanical engineering, fashion engineering, and software engineering. The results of observations in the four majors indicate that the quality of the products made by students still has

many limitations and is less than optimal. The low quality of the products produced by students during the project-based learning process is marked by the inconsistency of the products produced (Ngereja et al., 2020). The discrepancy of product results with standard specifications is also an indicator of the low quality of the product. In addition, the selling power of products is also a strong indicator of the low quality of the products produced by students during learning (Duckett & Tatarkowski, 2005).

The low quality of products produced by vocational education students is an ongoing problem and there is no clear effective solution to boost it. Vocational education is too focused on equipping students with practical skills to plan, design and make products so that they are finished, but it is not balanced with strengthening students' self-development (Ngereja et al., 2020). In addition, the strengthening of students' soft skills is still minimal, so it is possible that students' soft skills are weak and are the cause of the less than optimal product produced as a result of the hard skills process (Made Sudana et al., 2019). Thus, vocational teachers as learning managers are very important to develop students' soft skills to support optimal hard skills in producing a product.

Self-efficacy and emotional intelligence are self-development and soft skills that can help maximize the learning process (Kustyarini, 2020).

Self-efficacy is an individual's confidence and belief about his ability to do things from the beginning to achieve a goal (Bandura, 1995). While emotional intelligence refers to the individual's ability to control the emotions of himself and others in various ways. Strengthening self-efficacy and emotional intelligence can improve the learning outcomes of vocational education students (Goleman, 2000). Efficacy plays a role in fostering students' learning mentality to be brave and confident in learning (Hoang et al., 2021). Meanwhile, emotional intelligence plays a role in helping to build strong relationships, make good decisions, and deal with difficult situations during learning activities (Tur-Porcar et al., 2019).

Thus, in the context of outcome-oriented project-based learning in the form of products whose quality can be influenced by the role involvement of self-efficacy and emotional intelligence. Based on this description, this study aims to determine how much influence self-efficacy and emotional intelligence have on the quality of project-based learning outcomes and to find the determinant factors in these three variables. The research will be conducted based on the findings of the problem in the observations, which will be carried out in the automotive engineering department, mechanical engineering, fashion engineering, and software engineering.

## RESEARCH METHOD

This research is an ex-post facto research using a quantitative approach. The research was conducted with the aim of analyzing the effect of self-efficacy and emotional intelligence on the quality of the products resulting from project-based learning in vocational education. This study involved 356 vocational students in Yogyakarta as a population divided into four majors, namely automotive engineering, mechanical engineering, fashion engineering, and software engineering. The sampling technique was carried out using cluster random sampling and obtained a number of 228 respondents who were divided into the four majors. The distribution of the research sample is shown in table 1 below.

**Table 1.** Distribution of Samples

Regency	Name of SMK	Status	Students (%)
Sleman	SMK Negeri 2 Depok	Public School	26 (11,40)
Jogjakarta	SMK Muhammadiyah Moyudan	Private School	20 (8,77)
Bantul	SMK Negeri 6 Jogjakarta	Public School	24 (10,53)
Kulon Progo	SMK Muhammadiyah 3 Yogyakarta	Private School	24 (10,53)
Gunung Kidul	SMK Negeri 1 Sewon	Public School	24 (10,53)
	SMK Muhammadiyah 1 Bantul	Private School	18 (7,89)
	SMK Negeri 2 Pengasih	Public School	26 (12,07)

SMK Ma'arif Wates	3	Private School	24 (10,53)
SMK Negeri Saptosari	1	Public School	24 (10,53)
SMK Ma'arif Wonosari		Private School	18 (7,89)
Total			228 (100)

The product measured is the product of project-based learning in several subjects in four majors in SMK. The following list of measured products is shown in table 2 of product distribution below.

**Tabel 2.** Distribution of Product

Department	Name of Product
Automotive engineering	Vehicle engine construction design
	Vehicle electronic components
Mechanical engineering	Automotive body
	Welding Products
	Simple engineering tools
Fashion engineering	Industrial fashion making
	Custom made
Software engineering	Website and blogspot
	Application products

Data were collected through 2 methods, namely questionnaires and assessment. The questionnaire method was used to measure the variables of self-efficacy and emotional intelligence with a 4 Likert scale questionnaire instrument, namely Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). Meanwhile, assessment method was used to measure the quality of the product produced by using an assessment sheet instrument using 4 categories of average score assessment referring to the opinion of Mardapi

(Mardapi, 2012). , namely Very Good with score ( 78-100), Good ( 56-78), Fair ( 34-56), and Poor ( 12-34). The following grid of research instruments is shown in table 3 below

**Table 3. Instrument Grids**

Variable	Measurement	Indicators	Code	Item (n)
Self-Efficacy (Bandura, 1995)	Questionnaire	Level of experience	SE1	3
		Strength in ability	SE2	3
		Strength in belief	SE3	3
		Determination to keep trying	SE4	3
		Generality activities and work	SE5	3
Emotional Intelligence (Goleman, 2000)	Questionnaire	Self-awareness management	EI1	3
		Self-regulation	EI2	3
		Motivation	EI3	3
		Empathy	EI4	3
		Social skills	EI5	3
Product Quality (Duckett & Tatarkowski, 2005)	Assessment	Product suitability	PQ1	3
		Product consistency	PQ2	3
		Material quality	PQ3	3
		Product durability	PQ4	3

The data collected were analyzed using multiple linear regression analysis and confirmatory factor analysis. Regression analysis is used to test the hypothesis or measure the strength of the influence of the independent variable with the dependent variable which was previously preceded by tests of normality, linearity and multicollinearity. The hypotheses of this research are: (1) there is a significant positive effect of self-efficacy on the quality of the resulting product; (2) there is a significant positive effect of emotional intelligence on the quality of the

resulting product; and (3) there is a significant positive effect of self-efficacy and emotional intelligence on the quality of the resulting product. Meanwhile, confirmatory factor analysis is used to determine the determinant factors or indicators that build variables using the structural equation modeling (SEM) analysis model.

## **RESULT AND DISCUSSION**

### *1.1. Analysis Prerequisite Test*

Prerequisite analysis test was conducted to determine whether the data were normally and linearly distributed as a requirement to

perform linear regression analysis. The analysis prerequisite test contains a data normality test and a data linearity test. The analysis prerequisite test was carried out using SPSS V 21 software. The results of the data normality test are shown in table 5 below.

**Table 5.** Normality Test Result

Variable	N	KS	Sig	Dec.
Unstandardized Residual	228	0.518	0.494	Normal

Based on the results of the data normality test using the Kolmogorov Smirnov formula, the residual significance value was 0.494. The significance value is  $0.494 > 0.050$ , so it can be concluded that the data is normally distributed. After the data is known to be normally distributed, then the linearity test of the data is then carried out. The results of the linearity test are shown in table 6 below.

**Table 6.** Linearity Test Result

Variable Relationship	N	F	Sig	Dec.
X <sub>1</sub> *Y	228	1,157	0.345	Linear
X <sub>2</sub> *Y	228	1,266	0,269	Linear

Based on the results of the linearity test of the data, it is known that the significance value on the relationship line X<sub>1</sub> with Y and X<sub>2</sub> with Y<sub>2</sub> has a significance value of more than 0.050. These results can be concluded that variables X<sub>1</sub> and X<sub>2</sub> have a linear relationship with variable Y. After the data meets the linearity criteria, then a multicollinearity test is carried out to

determine whether the data has multicollinearity symptoms or not. The results of the multicollinearity test are shown in table 7 below.

**Table 7.** Multikoliearity Test Result

Variable Relationship	N	Tolerance	VIF	Dec.
X <sub>1</sub> *X <sub>2</sub>	228	0,971	1,030	No multicollinearity

The results of the multicollinearity test showed a tolerance number of 0.971 and a VIF of 1.030. The tolerance value is  $0.971 > 0.10$  and the VIF value is  $1.030 < 10.00$  so it can be concluded that there is no multicollinearity between the independent variables. Thus, after the data is tested to be normally distributed, have a linear relationship, and there is no multicollinearity, the analysis can be continued using analysis multiple linear regression.

### 1.2. Effect of Self-Efficacy toward Product Quality

Data on the effect of self-efficacy on product quality was obtained from a google form questionnaire instrument with a total of 15 statements for self-efficacy (X<sub>1</sub>) and from an observation instrument with a total of 12 items of product outcome assessment (Y). The following results from the regression analysis of X<sub>1</sub> against Y are shown in table 8 below.

**Table 8.** Effect of Self-Efficacy on Product Quality

Variable Relationship	df	t Values	t Table	Sig
X <sub>1</sub> *Y	227	2,473	1,96990	0.032

Based on the results of the regression analysis above, it is known that the t value is 2.473 with a significance value of 0.032. The t-count value is 2.473 > the t-table value is 1.96990 for df 227 and the significance value is 0.032 < 0.05, thus accepting the alternative hypothesis or it can be said that there is a significant positive effect of self-efficacy on the quality of project-based learning outcomes. Self-efficacy is an important aspect related to self-confidence and mentality in dealing with or carrying out an activity. Good self-efficacy will affect students' curiosity to do an activity (Putarek & Pavlin-Bernardić, 2019). In addition, through self-efficacy, students will be encouraged to explore learning resources and do any activities that are important to do in learning. Project-based learning that is oriented to product results really requires confidence and strong mentality from students. The complexity and variety of activities in the learning requires strong self-efficacy as well (Ichikawa et al., 2019).

### 1.3. Effect of Emotional Intelligence on Product Quality

Data on the effect of emotional intelligence on product quality was

obtained from a google form questionnaire instrument with a total of 15 statements for emotional intelligence (X<sub>2</sub>) and from an observation instrument with a total of 12 items of product outcome assessment (Y). The following results from the regression analysis of X<sub>2</sub> against Y are shown in table 9 below.

**Table 9.** Effect of Emotional Intelligence on Product Quality

Variable Relationship	df	t Value	t Table	Sig
X <sub>2</sub> *Y	22	4,565	1,9699	0.00
	7		0	0

Based on the results of the regression analysis above, it is known that the t-count value is 4.565 with a significance value of 0.000. The t-count value is 4.565 > the t-table value is 1.99714 for df 227 and the significance value is 0.000 < 0.05, thus accepting the alternative hypothesis or it can be said that there is a significant positive effect of emotional intelligence on the quality of project-based learning outcomes. In the context of learning, emotional intelligence plays an important role as self-control in various situations during learning (Ana et al., 2020). Project-based learning prioritizes soft skills as a counterweight to hard skills. Emotional intelligence is one of the



soft skills that students must have maturely. In producing high-quality products, it is largely determined by whether or not students are good in emotional processing and self-management (Tur-Porcar et al., 2019).

#### 1.4. Effect of Self-Efficacy Together with Emotional Intelligence on Product Quality

After knowing each effect of the independent variable on the dependent variable, then the effect of the independent variable on the dependent variable is simultaneously tested. The following results from multiple linear regression are shown in table 10 below.

Table 10. Multiple Regression Analysis Results

Variable Relationship	df	F Values	F Table	Sig
X <sub>1</sub> , X <sub>2</sub> *Y	227	13,671	3,04	0.000

Based on the results of the multiple regression analysis above, it is known that the calculated F value is 13.671 with a significance value of 0.000. The calculated F value is 13.671 > the F table value is 3.04 for df 227 and the significance value is 0.000 < 0.05, thus accepting the alternative hypothesis or it can be said that there is a significant positive effect of self-efficacy along with emotional intelligence on the quality of project-based learning outcomes. The balance between self-efficacy and emotional intelligence is very important for students in learning. Both aspects are

very important to be mastered and owned carefully (Rodríguez et al., 2020). In designing and making products on project-based learning, a balance between hard skills and soft skills is needed and is supported by strong self-development. Self-efficacy acts as a student's self-development that can make students brave and confident in working on a learning project. In addition, emotional intelligence acts as a soft skill that must be managed properly during project-based learning to improve the quality of the products produced (Kustyarini, 2020).

#### 1.5. Confirmatory Factor Analysis

The analysis used is confirmation factor analysis to determine the factor loading of each indicator of the independent variable and the dependent variable. The results of the confirmation factor analysis are shown in chart 1 below.

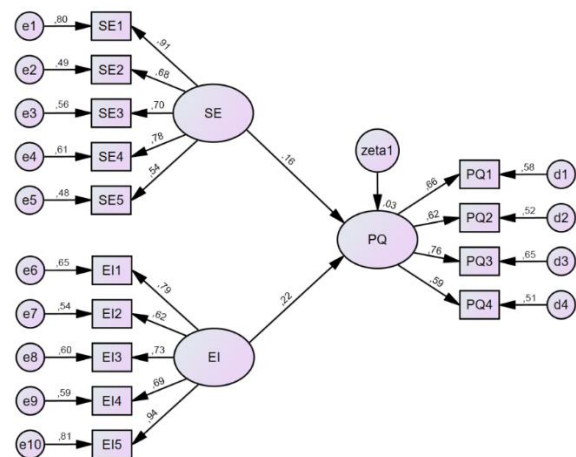


Figure 1. Confirmatory Factor Analysis Result

The results of the confirmation factor analysis in Figure 1 above can be explained that all indicators on self-efficacy have high scores. The first indicator is the level of experience being the highest loading factor in constructing self-efficacy. This means that the higher or more experience students have in learning something, the higher their self-efficacy. Student experience in learning is an important factor in increasing students' confidence and courage in doing a learning activity (D'Angelo & Presutti, 2019). The more experience students have, the students will have the courage and strong confidence to explore learning resources and carry out the learning process thoroughly (Hansen, 2000).

Then on the emotional intelligence variable loading the highest factor was constructed by the 5th indicator, namely social skills. In this case, it means that skill is the most important aspect in emotional intelligence. The more mastering social skills, the emotional intelligence of students will also be high. Social skills are an important aspect in shaping one's emotional intelligence. In the context of learning, students are required to have high social skills both with the environment and with other students. In the 21st century, teamwork in learning requires very

high social skills (Owens & Browne, 2021).

Meanwhile, in the product quality variable, the highest loading factor is in the 3rd indicator, namely the quality of the materials of the products produced. The quality of the ingredients of the product is very dominant, its aspects are fulfilled in product quality. This means that the higher the quality of a product, according to the assessment of students is a product with increasingly quality materials. The quality of the ingredients of a product is a very important aspect. The better the quality of the ingredients of a product, the more durable the product will be. In the context of project-based learning, it is very important for students to use good quality materials, so that they will produce good quality products as well. Thus, the product can be oriented to be sold in the market (Veelaert et al., 2020).

## **CONCLUSION**

Self-efficacy and emotional intelligence are important aspects that must be considered in project-based learning in vocational education. Self-efficacy and emotional intelligence significantly affect the quality of project-based learning outcomes. The higher the self-efficacy and emotional intelligence of students, the higher the

quality of the products produced in project-based learning. In self-efficacy, the level of experience is the most important indicator with the highest loading factor. Then, social skills have the highest loading factor in emotional intelligence. Meanwhile, the quality of the materials from the resulting product is considered to greatly determine the quality of a product produced in project-based learning by placing the indicator in the highest loading factor. Various strengthening of soft skills related to emotional intelligence and efforts to improve the quality of products produced in project-based learning. In addition, students' self-development efforts to foster self-efficacy are also very important to support the quality of the product in the learning process.

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