



The Effect of Work-Based Learning and Experiential Learning Models on The Student's Performance at Batam Welding Training Centre

Decky Antony Kifta¹, Muhammad Giatman², Wakhinuddin Simatupang²,
Ronald Watrianthos^{3✉}

Universitas Ibnu Sina Batam, Indonesia¹

Universitas Negeri Padang, Indonesia²

Universitas Al Washliyah Rantauprapat, Indonesia³

E-mail : decky.antony@uis.ac.id¹, giatman@ft.unp.ac.id², wakhinuddins@gmail.com²,
ronal.watrianthos@gmail.com³

Abstrak

Persaingan global yang semakin intensif menyebabkan perlunya perbaikan model pembelajaran di berbagai bidang termasuk pelatihan bengkel las yang mendidik siswa untuk meningkatkan keterampilan dan teknik pengelasan agar sesuai dengan kebutuhan industri. Kinerja mahasiswa merupakan faktor penting yang menghubungkan kemampuan mahasiswa untuk bertahan dengan dunia kerja saat ini dengan menerapkan keahlian mereka dan kondisi industri saat ini. Namun, model pembelajaran seperti pembelajaran berbasis kerja dan pembelajaran pengalaman menjadi peran yang sangat penting untuk mencapai kinerja yang diinginkan siswa, oleh karena itu, setelah penelitian yang cermat dalam premis pelatihan, tampak bahwa ada formula hipotetis yang mengarah pada pembelajaran berbasis kerja dan pengalaman. Model mungkin memiliki pengaruh yang signifikan terhadap kinerja siswa. Pembelajaran berbasis kerja dan experiential learning adalah metode atau model pembelajaran yang membawa siswa pada kondisi dan lingkungan yang lebih dekat dengan lingkungan kerja atau industri yang sebenarnya. Berdasarkan hipotesis tersebut, dalam penelitian ini dilakukan metode analisis dan digunakan analisis regresi linier, dan dari hasil tersebut terlihat bahwa model pembelajaran berbasis kerja dan model experiential learning berpengaruh positif dan signifikan terhadap kinerja siswa.

Kata Kunci: pembelajaran berbasis kerja, pembelajaran pengalaman, kinerja

Abstract

Global competition is becoming increasingly intensive and this caused learning models improvement to be needed in various areas which include the welding workshop training which educates the students to improve their welding skills and technique to comply with the industry requirements. The students' performance is an important factor that links the student's ability to survive with the current workforces by implementing their expertise and the current condition of the industry. However, the learning models such as work-based learning and experiential learning become very important roles to achieve the students intended performance, therefore, after scrutiny research in the training premise, it appears that there is a hypothetical formula that led that work-based and experiential learning models may have a significant effect on the students' performance. Work-based learning and experiential learning are learning methods or models which bring the students to the condition and environment closer to the actual environment of the workplace or the industry. Based on that hypothesis, a method of analysis was performed in this research, and the linear regression analysis was used, from the results, it becomes apparent that work-based learning and experiential learning models have a positive and significant impact on the students' performance.

Keywords: work-based learning, experiential learning, performance

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✉ Corresponding author:

Email : ronal.watrianthos@gmail.com

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INTRODUCTION

Today the fabrication industry is developed in Indonesia because this business supports the development of large industries such as Oil and Gas, renewable energy, and other mining industries. The welding industry is a business that supports fabrication, or it can be said that the welding industry is an industry that is the core of the fabrication industry. Therefore, the existence of the welding industry will continue to be needed in the world of the fabrication industry which then supports other industries such as Oil and Gas, renewable energy, and mining (Capezza et al., 2021).

Batam is an industrial city that has many companies engaged in manufacturing, shipping, production, oil, and gas. The company's production process is mostly related to welding, so welding personnel plays an important role for the company. The welding profession is required, from design, construction to operational activities (Hardiyanto et al., 2021).

For example, for shipbuilding, 40% of work is dominated by welding work, so the role of welding personnel will greatly determine project progress, costs, and ship delivery times (Siti Fariya, 2014). If the project is carried out by welding personnel who are inexperienced and have low skills, then the quality of the work produced is not good, so it requires relatively large costs in the work process carried out. For this reason, welding workers must have qualified skills and competencies before carrying out direct work practices in the industry. Welding is a metal joining technique by partially melting the parent metal and additional metal with or without pressure and creating a continuous bond.

Furthermore, according to Wiryosumarto and Okumura welding is connecting several metal rods using heat energy (Wiryosumarto & T, 2004). Meanwhile, according to (Hari Moektiwibowo, 2015) welding is a process of joining two or more metal parts using heat energy. Thus, metal welding is a local connection of several metal rods using heat energy, both the source of the heat of electricity and fire from gas combustion.

Batam Welding Training Center is one of the welding training institutions that aims to produce welding workers who have qualifications according to company needs. Qualifications are skills needed to do something, or occupy certain positions, in other words, qualifications are defined as things that are required both academically and technically to fill certain work levels.

The qualifications of welding power produced by the Batam Welding Training Center are divided into 3 categories, level one (basic), namely participants mastering welding position plate welding 1G to 4G, level two (advanced) namely participants mastering welding position plate 1G to 4G and pipe welding position 1G, 2G, 5G and 6G and level three (experts) who have mastered welding plates and pipes with various welding positions and have welding experience for 3 years.

LITERATURE REVIEW

Work-Based Learning

Work-Based Learning (WBL) is the application of models, planning, implementation, monitoring and supervision, and evaluation of work-based learning programs carried out by the management of the Batam. Welding Training Centre which is taught to welding training participants at the training institute. The aim is to provide field/industrial experience (industrial attachment) to the trainees in the industrial/work world (Marlina et al., n.d.) (Rahmawati & Suroto, 2019). Many definitions have been put forward regarding the notion of work-based learning. Often work-based learning is interchanged with work-related learning (Connor & MacFarlane, 2006). Several definitions explain that work-based learning is all forms of learning through the workplace, whether in the form of work experience (work experience) or work under guidance (work shadowing) for a certain time. Another definition states that WBL is all learning that occurs because of activities at work (Little, 2006) (Marlina et al., 2020).

1632 *The Effect of Work-Based Learning and Experiential Learning Models on The Student's Performance at Batam Welding Training Centre – Decky Antony Kifta, Muhammad Giatman, Wakhinuddin Simatupang, Ronal Watrianthos*
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Various forms/models of WBL include:

1. Apprenticeship opportunities,
2. Career mentorship,
3. Cooperative work experience,
4. Credit for prior learning (CPL) or internship,
5. Job shadowing,
6. Practicum,
7. School-based entrepreneurship,
8. Service learning,
9. Teacher externships,
10. Tech-prep,
11. Vocational student organizations,
12. Volunteer services,
13. Worksite field trips.

Experiential Learning

Experiential Learning (EL) is a student-centered approach to learning that starts with the premise that the best learning is from experience. And for a learning experience to be truly effective, it must use the entire learning wheel, from setting goals, conducting observations and experiments, re-examining, and planning actions. If this process has been passed it allows students to learn new skills, new attitudes, or even new ways of thinking (Evans, 2021).

Learning will be more meaningful if students experience what they learn, not just know it. Learning oriented to mastery of the material proved successful in short-term memory competition but failed to equip children to solve problems in long-term life. Contextual learning (Contextual Teaching and Learning) and experiential learning (Experiential Learning) are learning concepts that relate the material they teach to real-world situations and encourage learning participants to make connections between their knowledge and its application in their daily lives, involving six main components. effective learning, namely: constructivism (Constructivism), asking (Questioning), finding (Inquiry), learning community (Learning Community), modeling (Modeling), and actual assessment (Authentic Assessment) (Yildiz, 2021) (Ardiana et al., 2021).

With this concept, learning outcomes are expected to be more meaningful. The learning process takes place naturally in the form of working and experiencing activities, not transferring knowledge. Learning strategies are more important than results. The process is a cycle from classroom lecture - informal interview - industry tour – job visit – entry-level work experience – on-the-job (OTJ) training – approved apprenticeship program – competitive employment (Budhai & Skipwith, 2021).

Performance

Performance is a translation of the word performance which is defined as a person's overall level of success during a certain period in carrying out the task compared to various possibilities, such as work results standards, targets or targets or criteria that have been determined in advance in advance and mutually agreed. It is providing an understanding of performance as a result obtained by an organization whether the organization is profit-oriented and non-profit oriented for a period. This understanding provides an understanding that performance is an act or behavior of a person who is directly or indirectly directly observable by others (Song et al., 2021) (van Ruitenbeek et al., 2021).

Meanwhile, Mulyasa (2015) defines performance as work performance, work implementation, work achievement, results of work, or performance. Based on some of the definitions stated above. Performance is more connotes to the extent to which a person performs good activities that about duties and obligations in

accordance with the level of competence mastered or in other words, performance as behavior is more driven and coordinated by knowledge and information mastered someone in carrying out activities under the demands of their duties (Song et al., 2021).

The performance of teachers or trainers in their activities can improve the implementation of tasks and work so that teachers act and think more actively and creatively. Because high activity and creativity can run well if supported by a good work culture. Concerning the quality of education services, learning is at the core of the quality of education in schools, where teachers play a direct role in efforts to improve the quality of learning (Song et al., 2021).

However, the performance which is related to this research is the performance of welding skills, which the welding trainees should possess. Welding is a process in which similar materials are bonded together to make a connection through chemical bonds using heat and pressure (Suratman, 2001). The intent and purpose of welding is to join two or more metals in a complete joint. In the early stages of the development of welding technology, welding was used for less important repairs. However, over time the welding process and the use of welding construction are common in all countries of the world.

Meanwhile, according to the American Welding Society (Society, 1981), welding is a process of joining metals or non-metals produced by heating materials that are connected by high temperatures with pressure and without the use of additional metals. The students or trainees who master their skill in welding will be considered as having good performance in welding knowledge and will be doing good when they have completed the training sessions and be able to get jobs as welders or welding operators in the relevant industries (Morris, 2020).

METHOD

Respondents

The approach in this research is quantitative, including the type of ex-post-facto research. This research uses the correlational descriptive method. This method describes the influence and relationship between research variables. The population in this study were all students from Batam Welding Training Centre, located in Pulau Batam, which comprising of 200 students. The sampling technique used is proportional random sampling technique accumulates the number of research samples as many as 98 students.

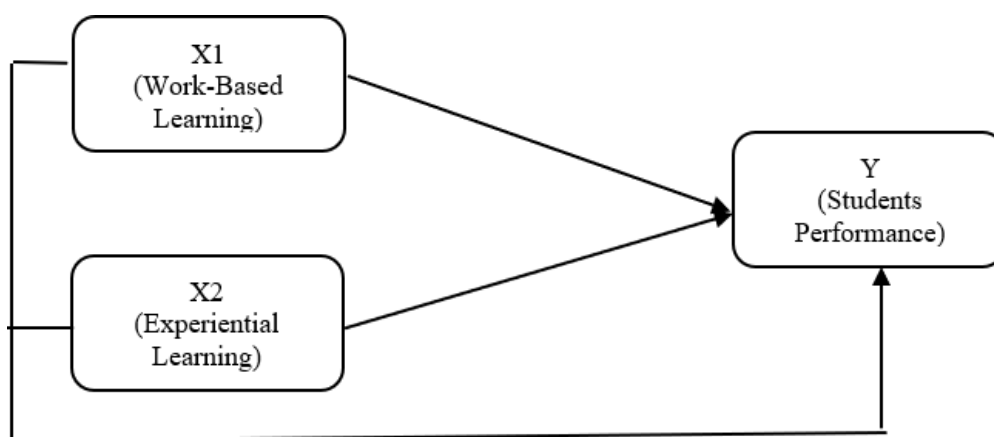


Figure 1. Conceptual Framework

Research Conceptual

1. Work-Based Learning technique is believed to influence the students' performance. This variable is regarded as variable X1.

1634 *The Effect of Work-Based Learning and Experiential Learning Models on The Student's Performance at Batam Welding Training Centre – Decky Antony Kifta, Muhammad Giatman, Wakhinuddin Simatupang, Ronal Watrianthos*
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2. Experiential Learning technique is to influence the students' performance. This variable is regarded as variable X2.
3. Performance is a student's overall level of success during a certain period in carrying out the task compared to various possibilities. This will become the dependent variable Y.

Research Instruments

The instrument used in this study was a questionnaire given to the students trained in Batam Welding Training Centre regarding their opinions about the effects of work-based learning, experiential learning on their welding skill performance.

Data Analysis

1. Validity Test

A validity test is performed to check the ability of instruments to measure the objects or issues being analyzed (Nugroho, 2011).

2. Reliability Test

A reliability test is performed to check how accurate the instruments can be trusted or reliable to measure the objects or issues being analyzed (Nugroho, 2011).

3. Linearity Test

The hypothesis used to test the linearity of the regression is stated as follows.

H0: The regression model is linear.

H1: The regression model is non-linear.

If F value > F table or Sig α (0.05) then it is said that the model is linear, when using Deviation from linearity, however, if F value < F table or sig α > (0.05) then the model is said as linear.

4. Multicollinearity

The hypothesis used to test if there is multicollinearity or not is stated as follows.

H0: There is no effect between the independent variable

H1: There is a significant effect between the independent variables

The criteria used to check these connections or effects are as follow:

If significant coefficient < α (0.05) then it can be said that there is multicollinearity but if significant coefficient > α (0.05) then it can be said that there is no multicollinearity in the model.

5. Normality Test

The test is useful to find out whether the dependent variable, independent and both are distributed normal, close to normal or not, If the data is normally distributed, then parametric analysis including model's regression can be used, (Umar, 2008:77) To test it, we would use the normality test tool, namely, One-Sample Kolmogorov-Serminov, and if the value obtained > 0.05, it can be concluded that all the data are distributed normally.

6. Autocorrelation

To test the autocorrelation the category used is that if the Durbin Watson value is almost 2 then we can assume there is no autocorrelation, however, if the DW value is more than 2, this can be concluded that there is autocorrelation.

This study uses the variable independent, which consists of leadership variables principal, teacher work discipline, and teacher self-concept. Then use multiple linear regression, namely the analysis of forecasting the value of the influence of two variables independent or more on the variable bound to prove there is or whether there is a functional relationship causal relationship between two variables or more (Riduwan and

Sunarto, 2013:108). Benefit from analysis results regression is to decide whether rising and the decrease in the dependent variable can be done by increasing the variable independent or not (Sugiyono, 2016:260), Conceptually multiple linear regression analysis has a causal relationship with formula as follows:

$$Y' = a_1 bX_1 + a_2 bX_2 + a_3 bX_3 \quad (1)$$

Information:

Y = dependent variable (Students' Performance)

a = constant price (the value of Y when X value =0)

b = values of independent variables

X1 = independent variable (Work-Based Learning)

X2 = independent variable (Experiential Learning)

The accuracy of the sample regression function in appraising actual value can be appraised with Hypothesis Testing / Goodness of Fit (Imam Ghozali, 2001), statistics, Goodness of Fit can be measured from the F test value, t-test value, and coefficient determination.

RESULT AND DISCUSSION

Validity and Reliability Tests

The numbers of respondents are 98 students, therefore, the value of the r table is obtained from the t table of product-moment Pearson with the value df (degree of freedom) = n-2, so the df becomes 98-2 = 96. From the r table, then we can get the value of 0,167. The data can be called valid if r calculated \geq r table. When it is necessary to perform a reliability test then we can use the value of Cronbach's Alpha. If the alpha value \geq 0.60, therefore, the data can be considered reliable. Below is the table of how the validity and reliability are performed.

Table 1
Validity and Reliability Tests

Indicators	Validity Test		Remarks	Reliability Test		
	r values	r table		Alpha value	Cronbach's Alpha	Remarks
Y.1	0.641			0.794		
Y.2	0.266			0.822		
Y.3	0.183	0.167	Valid	0.825	0.60	Reliable
Y.4	0.565			0.800		
Y.5	0.334			0.815		
X1.1	0.546			0.804		
X1.2	0.349			0.814		
X1.3	0.308	0.167	Valid	0.817	0.60	Reliable
X1.4	0.625			0.795		
X1.5	0.552			0.802		
X2.1	0.369			0.815		
X2.2	0.371			0.813		
X.2.3	0.647	0.167	Valid	0.792	0.60	Reliable
X.2.4	0.520			0.803		
X2.5	0.306			0.816		

Based on Table 1 above the indicators are valid and reliable, valid is due to all indicators values (r actual) \geq r table and they are also reliable due to all indicators' alpha values \geq 0.60.

Autocorrelation Test

To check the autocorrelation between the variables using the Durbin-Watson value (dl and du). If $du < d_{actual} < 4-du$, this means that there is no autocorrelation. The value of dl and du for 98 respondents i.e., $du = 1.736$ and $dl = 1.613$. Autocorrelation was analyzed using SPSS, and the results of that testing are as per below:

Table 2
Autocorrelation Outputs

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.715 ^a	0.511	0.500	1.717	2.135

a. Predictors: (Constant), Work-based Learning, Experiential Learning

b. Dependent Variable: Students' performance

Based on the above Table, it is found that the results of the Durbin-Watson value fall between $1.736 < 2.135 < 2.264$, therefore, there is no evidence of autocorrelation.

Multicollinearity Test

Seeing from the below Table 3, that Work-Based Learning (X₁) and Experiential Learning (X₂) are found with multicollinearity

Table 3
Multicollinearity Test

Remarks	Correlation between Variables	Coefficient R	Sig. (2-tailed)
There is multicollinearity	Work-Based Learning (X ₁) with Experiential Learning (X ₂)	0.663	0.000

When the significance value is in 2-tailed therefore, that α value is 0.025 and from the Table Sig. value is $0.000 < 0.025$. This can be concluded that there is multicollinearity between X₁ and X₂.

F Test

F Test is performed to test the effect of all independent variables towards their dependent variable. To find out whether independent variables simultaneously influence the dependent variable. To understand the values, we can use the below Anova Table.

Table 4
ANOVA^a

Model	Sum of Squares	df	Mean Square	F	Sig.
1 Regression	292.321	2	146.161	49.553	0.000 ^b
1 Residual	280.209	95	2.950		
Total	572.531	97			

a. Dependent Variable: Students' Performance

b. Predictors: (Constant), Work-Based Learning, Experiential Learning

The table above shows at the same time Work-Based Learning and Experiential Learning simultaneously influence the Students' Performance; this can be seen from the calculated F value of 49.553 which is greater than the F table value of 3.09. The significance value of 0.000 which is smaller than 0.05 indicates that simultaneously Work-Based Learning and Experiential Learning influence positively and significantly the Students' Performance.

Coefficient Regression

Coefficient Regression is used to measure the effects of independent variables towards their dependent variable. Below is the Table of Multiple Regression.

Table 5
Coefficient Regression

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	5.011	1.635		3.064	0.003
1 Work-Based Learning	0.470	0.105	0.454	4.492	0.000
Experiential Learning	0.291	0.092	0.319	3.154	0.002

a. Dependent Variable: Students' Performance

From the Coefficient Regression (Table 5) above we can obtain the regression equation as per below: $Y = 5.011 + 0.470 X_1 + 0.291 X_2$, this means that the constant value of the equation is 5.011, while coefficient regression value of $X_1 = 0.470$ and $X_2 = 0.291$.

CONCLUSION

The conclusion is that Work-Based Learning and Experiential Learning partially or individually have a positive and significant influence on students' performance at the Batam Welding Training Centre. This was indicated by the t values (Table 5) which show that all the values are higher than the t table value (1.972).

The table also shows the equation regression of $Y = 5.011 + 0.470 X_1 + 0.291 X_2$, which means that good stimulation of Work-Based Learning and Experiential Learning techniques will increase the students' performance. Referring to Table 4, we can also learn that F test value $> F$ table ($49.553 > 3.09$) this concludes that Work-Based Learning and Experiential Learning simultaneously affect the students' performance at Batam Welding Training Centre in Batam Island.

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- 1638 *The Effect of Work-Based Learning and Experiential Learning Models on The Student's Performance at Batam Welding Training Centre – Decky Antony Kifta, Muhammad Giatman, Wakhinuddin Simatupang, Ronal Watianthos*
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