

Practice Intensity Influences Successful Learning Outcomes: Study at Vocational High School in Serui, Papua, Indonesia

Calvin Mamahit, Harrichoon Angmalisang, Nontje Sangi, and Paulus Rex Marani

State University of Manado, Indonesia

DOI: <https://dx.doi.org/10.47772/IJRISS.2023.7012072>

Received: 09 December 2023; Accepted: 28 December 2023; Published: 04 January 2024

ABSTRACT

This study aims to assess the influence of practice intensity on the electrical installation learning outcomes of students at Kainui Serui State Vocational School in Papua. Electrical installation learning outcomes at SMKN (State of Vocational High School in Indonesia) Kainui, Serui-Papua, need to be improved due to students' lack of practical learning outcomes. According to research findings, there needs to be more practical intensity in this learning. This study used a quantitative-associative technique. The acquired data was then subjected to a fundamental linear regression analysis. The study yielded a coefficient of determination of .581. These findings indicate that the intensity of practice has a 58.1% effect on the electrical installation learning outcomes of students at Serui at Kainui Vocational High School in Papua.

Keywords: practice intensity, learning outcomes, vocational education

INTRODUCTION

Vocational high schools provide a variety of subjects, one of which is power installation engineering skills. This topic seeks to enhance student competency in electrical installation knowledge, abilities, and attitudes. This competency is designed to help students gain experience installing electrical installations and planning and managing problems under their obligations as electrical power installation technicians and executives. These abilities also become provisions and expertise for students, which they might utilize as part of their employment. "This condition is consistent with the objectives of the Electrical Power Installation Engineering Expertise Program, which generally refers to the contents of the National Education System Law in Indonesia, Article 3 concerning the National Education Goals, and the explanation of Article 15, which states that vocational education is secondary education that prepares students primarily for work in a specific field (UU RI No. 20 Tahun 2003 Tentang Sistem Pendidikan Nasional, 2003)."

Kainui State Vocational School, located at St. Kainui-Wadapi, Kainui I, District Angkaisera, Kab. Yapen Islands, Papua, is one of the secondary education institutions in Kainui that the Ministry of Education and Culture oversees. At Kainui State Vocational School, students learn all day. Five days of study are completed in a week. In carrying out its responsibilities, Kainui State Vocational School seeks to increase educational quality by enhancing facilities and infrastructure, teaching and learning process quality, and educator quality. These modifications and enhancements are ongoing to increase the quality of student learning results.

Many factors can impact student learning outcomes (Asim et al., 2021), including those that originate within and outside the individual (Baber, 2020; Kintu et al., 2017; Merchant et al., 2014; Nortvig et al., 2018). Students must study in order to get excellent and high-quality learning outcomes (Kasza et al., 2017). Learning is the process by which behavior changes or is renewed (Bouton, 2014). Direct experience

(learning experience) is the best way to learn (Morris, 2020). Students who learn by direct experience must see it firsthand, enjoy it, be actively involved in the activity, and be accountable for the outcomes. The importance of “learning by doing” and active involvement in learning influences student learning outcomes. This phrase implies that increasing the intensity of practicum, or directly and continually practicing, is one of the most excellent strategies to improve learning results. Students and teachers interact during the teaching and learning process, both within and outside the classroom. Learning is more than just grasping theoretical notions; it may also be done practically (Sutrisno & Siswanto, 2016). In this study, indicators of student learning outcomes were derived from several aspects, including knowledge, understanding, application, analysis, synthesis, and evaluation. These were summarized using student answer sheets on questions about electrical installation learning outcomes.

In practice, students perform activities based on theories in the laboratory, field, or workshops (Andresen et al., 2020). The practicum aims to broaden students’ understanding based on the content delivered. The three categories of practice objectives are high cognitive skills, emotional skills, and psychomotor skills (Chairulsyah & Wakhinuddin, 2022). These three objectives will be met if students engage in rigorous practicum. Practice intensity is the capacity and sincerity with which students engage in direct learning to achieve a better understanding, knowledge, and behavior via practice procedures and experiences at school and home (Freeman et al., 2014).

The level of success of students’ learning goals, meaning enhancing their learning outcomes, is heavily influenced by their learning intensity or practice intensity (Orphanos & Orr, 2013). Intensity is the effort expended by someone excited about achieving a goal (Richter et al., 2016). Based on the criteria above, practice intensity may be defined as the level of frequency or frequency of students completing practicum (Yuliawan et al., 2018).

Learning activities (theory and practice) are the most fundamental activities in the entire educational process at school (Moore, 2014). A practicum is primarily a direct learning activity in the field or workshop that involves students applying or implementing previously acquired theory on items that are used as practical media (Baird & Mollen, 2023). Whether or not the learning objectives are met depends on how students perceive the learning process (Boud & Soler, 2016). So, various factors might contribute to student achievement when it comes to learning.

The degree of practice intensity is categorized into three (three) (Rahman, 2018), namely:

1. A high level of practicing zeal

Great practice intensity is the result of an incredible learning drive. Students with high practice motivation are success-oriented and self-confident in tackling the tasks that must be performed, as well as goal-directed and future-oriented. Aside from that, pupils who enjoy challenging school projects prefer to work with intelligent individuals, even if such people are less friendly to them and dislike wasting time.

2. Moderate Practice Intensity

Students with medium practice intensity levels had higher learning motivation levels than those with low motivation levels. They frequently need more self-confidence when confronted with assignments and help with their practical duties.

3. The intensity of practice is low.

A low level of practice intensity has the following characteristics: little time to study, no learning goal, no enthusiasm for facing difficulties in learning, little effort in learning, no clear goals so that learning results

are not satisfactory, and dislikes learning activities.

Practice intensity has numerous indications (Rahman, 2018), including:

1. Inspiration

Motivation will motivate a student to achieve the best possible learning outcomes. If motivated, someone who practices will achieve good learning results with rigorous work. The strength of student motivation heavily influences the accomplishment of learning outcomes (Mega et al., 2014).

2. The duration of the practicum

The practicum duration is when the ability is employed to carry out practicum tasks. This duration indicates that motivation is shown in a person's capacity to use their time for practice, precisely the time pupils designate for practice each day (Ryan et al., 1996).

3. The frequency of practicums

The number of times practical activities are carried out in a specific period is the frequency (Harefa et al., 2021). Students, for example, frequently engage in practical tasks within and outside the classroom.

4. Presentation

The presentation under consideration is one of passion, desire, or high hope. The operations are intended to attain the intended intents, plans, ideas, goals, or aims and are evident from the pupils' tremendous desire to study.

5. Attitude and Direction

Attitude is taught, and attitude impacts how people react to events and what they want out of life (Lestari et al., 2016). Attitudes are constantly related to an item, and pleasant or negative sensations accompany these attitudes. People with a negative attitude tend to avoid, despise, or loathe specific items. Meanwhile, the action inclination in its positive form is to approach, like, and hope for particular items. This mindset then underlies and drives a series of interconnected activities.

6. Hobbies

Interest emerges when a person is interested in something because it meets their needs or because they believe that anything they will be involved in has importance for them. Interest is a desire for something or an activity that is carried out without being asked (Simbolon, 2013). Students interested in practice will often engage in various tasks throughout the practicum, including focusing, listening, asking questions, taking notes, and memorizing.

Based on observations, several problems were found that could be identified, such as:

1. Students still need to be more active and tend to be less serious about participating in practice.
2. Lack of practice hours in Electrical Installation Engineering subjects.
3. Students need to remember when asked about previously taught material.
4. Students remain silent when the teacher mentions or asks questions about previous material.
5. Inadequate conditions and facilities for practical equipment.
6. Classroom conditions are not conducive when the teaching and learning process takes place.
7. Low student learning outcomes.

Considering the extent of the existing problems, the researchers limited themselves to the intensity of practice on students' electrical installation learning outcomes. The problem may be constructed based on the problem identification and problem limits discussed above, namely, does the intensity of electrical installation practice impact the electrical installation learning outcomes of Kainui Serui State Vocational School students in Papua? This study aims to assess the influence of practice intensity on the Electrical Installation learning outcomes of students at Kainui Serui State Vocational School in Papua.

METHOD

The quantitative associative approach was applied in this study. Associative research seeks to establish the effect or link between two or more factors.

Learning outcomes are the results of assessments of completed learning activities. They are a type of final formulation provided by teaching staff to determine how students' abilities are expressed in symbols, numbers, letters, or sentences that can reflect the results achieved. This study measured student learning outcomes using student answer sheets on questions linked to the Electrical Power Installation Engineering curriculum.

The following learning outcome indicators are:

1. Knowledge;
2. Comprehension;
3. Application;
4. Analysis;
5. Synthesis;
6. Evaluation.

Practical intensity refers to a student's eager endeavor to attain a goal, or, in other words, the student's frequency or intensity in carrying out practicum.

Indicators of practice intensity include:

1. Practice Motivation;
2. Duration and Frequency;
3. The practicum includes a percentage or aim;
4. Establish practice direction;
5. There is a desire to practice.

Population is a broad category that includes objects and subjects with specific attributes and characteristics chosen by researchers to be researched and conclusions formed. All class X students majoring in Electrical Installation Engineering at Kainui Serui Vocational School in Papua participated in this study. The sampling approach employed in this research is simple random sampling, which involves randomly sampling population members without regard for strata; using this technique, each population has the same chance of becoming a sample member.

Research Instruments for Testing

The level of validity of an instrument is measured using validity. A valid instrument has a high level of validity. A less valid instrument, on the other hand, has a low validity. The SPSS program was utilized for validity testing in this study. The r calculation results were then compared to the r table value at a

significance level .05. If the r-calculated value > r-table value, the instrument item is valid; if the r-calculated value < r-table value, the instrument item is invalid.

Because the instrument is good, reliability is a type of instrument that can be trusted to be utilized as a data-gathering tool. The reliability test aims to assess the consistency of a person's responses to the questionnaire's question items. Each variable's Cronbach Alpha (α) score determines the reliability test requirements. A variable is deemed dependable if it has a Cronbach Alpha value greater than .70.

METHOD OF DATA ANALYSIS

The data analysis methodology employs statistical procedures, including basic regression and hypothesis testing, which are examined with the SPSS program.

This study analyzed the data using a basic linear regression analysis model. Simple linear regression analysis aims to determine how the independent variable affects the dependent variable. A basic regression formulation can be written as follows:

$$\hat{Y} = \alpha + \beta X \quad (1)$$

Where:

\hat{Y} : Learning Outcomes

α : Constant

β : Regression coefficient

X: Practice Intensity

T-test hypothesis testing examines how the independent variable affects the dependent variable. The degree of significance of the independent variable is examined in this test.

Decision-making basis:

1. Accept H_0 if the probability (significance) is more significant than .05 (α).
2. If the likelihood (significance) is less than .05 (α), reject H_0 and accept H_1 .

The coefficient of determination test determines the amount of the independent variable's effect on the dependent variable.

RESULT AND DISCUSSIONS

Based on the instrument validation test results, it was discovered that r count > r table, and based on the validity testing results, it can be concluded that all questions on the Practice Intensity (X) and Learning Outcomes (Y) variables are suitable for use because they have a calculated r value > .396, indicating that the instrument used is suitable for use.

The Cronbach Alpha (α) value for each variable is used to perform the reliability test. A variable is deemed dependable if it has a Cronbach Alpha value greater than .70. The researcher utilized the SPSS software in this test.

Table 1. Test for Reliability

No	Variable	Cronbach's Alpha	Items	Decision
1	Intensity of Practice	.838	10	Reliable
2	The results of learning	.837	10	Reliable

According to Table 1, the Cronbach's Alpha value produced by each variable is as follows: Practice Intensity (X) from 10 items achieved a Cronbach's Alpha value of .838 or 83.8%, and Learning Outcomes (Y) from 10 items acquired a Cronbach's Alpha value of .837 or 83.7%. Thus, Practice Intensity (X) and Learning Outcomes (Y) elements may be reliable since they satisfied the standards when Cronbach's Alpha value was more than .70.

The normality test employs a test based on the Kolmogorov-Smirnov table to determine whether the data is usually distributed by comparing the significant value from the Kolmogorov-Smirnov table generated by the SPSS software." If the output significance value is larger than the criterion, .05, the data can be assumed to be regularly distributed. The SPSS program is used for this normalcy test.

Table 2. Normality check

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		25
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	2.76340745
Most Extreme Differences	Absolute	.140
	Positive	.140
	Negative	-.118
Test Statistic		.140
Asymp. Sig. (2-tailed)		.200 ^{c,d}
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		
d. This is a lower bound of the true significance.		

Table 2 shows that the value of Asymp. Sig. = .200 is by the rules, namely, if the significance value of the Kolmogorov-Sminorv output is more significant than .05, the data is usually distributed. A p-plot may also be used to perform the normality test; if the points appear near the diagonal line, the data distribution is deemed normal.

Linearity testing is performed when a regression equation model of variable Y on variable X is tested. The linearity test meets the prerequisites for regression analysis, which demands a functional connection between X and Y in a linear population. The linearity test determines whether two variables have a substantial linear impact. If the significance value is more than .05, there is a linear link; if the significance value is less than .05, there is no linear association. The linearity test findings indicated that the significance value was .700 (more than 0.05). As a result, a substantial linear association exists between practice intensity and electrical installation learning results.

Linear regression analysis makes use of data from dispersed questionnaires. The SPSS application was used to do this test computation. The results of the simple linear regression analysis test are shown in Table 3.

Table 3. Test Results for Simple Linear Regression Analysis

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	7.432	4.615		1.610	.121
	The results of learning	.780	.138	.762	5.643	.000

1. Dependent Variable: Practice Intensity

The constant value (a) is 7.432, and the learning outcomes value (b/regression coefficient) is .780, as shown in Table 3. These findings may be included in the regression equation as follows:

$$Y = a + bX + e \text{ or } Y = 7.432 + .780 X$$

The constant is 7.432, indicating that the variable consistency value is 7.432, and the X regression coefficient is .780, indicating that adding 1% of the Practice Intensity value increases learning outcomes by .780. Because the regression coefficient is positive, the direction of effect of Practice Intensity (X) on Learning Outcomes (Y) is positive. Moreover, because the significant value derived from Table 3 is .000 (< .05), it can be stated that the Practice Intensity variable (X) influences the Learning Outcome variable (Y).”

The t-test was used to determine the influence of the independent variable on the dependent variable. The degree of significance of the independent variable is examined in this test. The t-table value with an alpha of 5% and a sample size of n minus k variables utilized yields a t-table of 1.714.

Table 4. Test results with variable impact (t-test)

Coefficients ^a						
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	Constant	7.432	4.615		1.610	.121
	The results of learning	.780	.138	.762	5.643	.000

1. Dependent Variable: Practice Intensity

The estimated t-value of 5.643 is more significant than the t-table value of 2.06866, with a significance value of 0.00 (< .05), as shown in Table 4. Because the computed t-value > t-table and the significant value is less than .05, practice intensity may be assumed to influence learning outcomes positively and significantly. So, H0 is rejected, and H1 is approved. As a result, the intensity of practice has a positive and substantial effect on the learning outcomes of Electrical Installation.

Statistical calculations were performed using the coefficient of determination to determine how much effect practice intensity (X) had on electrical installation learning outcomes (Y).

Table 5. Test for Coefficient of Determination

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.762 ^a	.581	.562	2.823

- a. Predictors: (Constant), Practice Intensity
- b. Dependent Variable: Learning Outcomes

According to the results of Table 5, the magnitude of the relationship value (R) is .762. The coefficient of determination (R Square) calculated from the output is .581, indicating that the independent variable (intensity of practice) has a 58.1% effect on the dependent variable (Electrical Installation learning outcomes).”

The level of success of students’ learning goals, meaning enhancing their learning outcomes, is heavily influenced by their learning intensity or practice intensity. Intensity is the effort expended by someone excited about achieving a goal. One of the internal elements that determines learning outcomes is intensity.

It is possible to conclude from the presentation outcomes and explanation of the difficulties examined in the SPSS program that the assertions and hypotheses in this research have been addressed, and the findings are known. According to the test results, the intensity of practice positively and significantly affects electrical installation learning outcomes. The calculated t-value is 5.643 > t-table 1.714 with a significance value of .00 (< .05), indicating that Ho is rejected and Ha is accepted. As a result, practice intensity positively and significantly impacts electrical installation learning outcomes.

The findings of a prior study back this study, “The Influence of Intensity, Motivation, and Interest in Using Computers as a Learning Media on Student Learning Outcomes at SMP Negeri 14 Purworejo,” done by Rifka Fauzia (2013). According to the findings, the Intensity Variable has a favorable and substantial influence on student learning outcomes (Fauzia, 2013). This study demonstrates the importance of intensity in learning. The greater the students’ intensity in practicing or studying and according to all of the school’s regulations, the more likely it is that students at the Kainui Serui Papua Vocational School will improve their learning results in the future.

CONCLUSION

Practice intensity influences electrical installation learning results by 76.2%, with the remaining 23.8% impacted by characteristics not included in this study. The t or partial test findings indicate that practice intensity favors and significantly influences electrical installation learning outcomes. Because the estimated t-value of 5.643 is more significant than the t-table value of 1.714, the H1 hypothesis that practice intensity impacts electrical installation learning outcomes is accepted.

There is a need to raise the intensity of practice, the frequency of practicum, direction, and attitude to assist students in practicing well and improving learning outcomes in electrical installations. This study solely looks at the impact of practice intensity on students’ electrical installation learning outcomes at Kainui Serui State Vocational School in Papua. It is envisaged that more study would result in a more complicated model that explains the factors that impact Electrical Installation learning results.

REFERENCES

1. Andresen, L., Boud, D., & Cohen, R. (2020). Experience-based learning. In *Understanding Adult Education and Training* (pp. 225–239). Routledge.

2. Asim, H. M., Vaz, A., Ahmed, A., & Sadiq, S. (2021). A Review on Outcome Based Education and Factors That Impact Student Learning Outcomes in Tertiary Education System. *International Education Studies*, 14(2), 1–11.
3. Baber, H. (2020). Determinants of Students' Perceived Learning Outcome and Satisfaction in Online Learning during the Pandemic of COVID-19. *Journal of Education and E-Learning Research*, 7(3), 285–292.
4. Baird, B. N., & Mollen, D. (2023). *The internship, practicum, and field placement handbook: A guide for the helping professions*. Taylor & Francis.
5. Boud, D., & Soler, R. (2016). Sustainable assessment revisited. *Assessment & Evaluation in Higher Education*, 41(3), 400–413. <https://doi.org/10.1080/02602938.2015.1018133>
6. Bouton, M. E. (2014). Why behavior change is difficult to sustain. *Preventive Medicine*, 68, 29–36. <https://doi.org/https://doi.org/10.1016/j.ypmed.2014.06.010>
7. Chairulsyah, & Wakhinuddin. (2022). Hubungan Intensitas Belajar Mandiri dengan Hasil Belajar Praktek Standar Kompetensi Perbaikan Sistem Rem Siswa Kelas XI Teknik Kendaraan Ringan di SMK Negeri 2 Kabupaten Tebo. *Automotive Engineering Education Journals*, 3(1).
8. Fauzia, R. (2013). Pengaruh Intensitas, Motivasi dan Minat Penggunaan Komputer Sebagai Media Pembelajaran terhadap Hasil Belajar Siswa pada Mata Pelajaran Teknologi Informasi Dan Komunikasi (TIK) Di SMP Negeri 14 Purworejo [Skripsi]. Universitas Negeri Yogyakarta.
9. Freeman, S., Eddy, S. L., & Wenderoth, M. P. (2014, May 12). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*. <https://doi.org/https://doi.org/10.1073/pnas.1319030111>
10. Harefa, D., Ge'e, E., Ndruru, K., Ndruru, M., Dian, L., Ndraha, M., Telaumbanua, T., Sarumaha, M., & Hulu, F. (2021). Pemanfaatan Laboratorium IPA di SMA Negeri 1 Lahusa. *Edumatsains*, 5(2), 105–122. <http://ejournal.uki.ac.id/index.php/edumatsains>
11. Kasza, P., High, K. W., & Slater, T. F. (2017). A Survey Of Best Practices And Key Learning Objectives For Successful Secondary School STEM Academy Settings. *Contemporary Issues in Education Research-First Quarter*, 10(1). <https://doi.org/https://doi.org/10.19030/cier.v10i1.9880>
12. Kintu, M. J., Zhu, C., & Kagambe, E. (2017). Blended learning effectiveness: the relationship between student characteristics, design features and outcomes. *International Journal of Educational Technology in Higher Education*, 14(1), 7. <https://doi.org/10.1186/s41239-017-0043-4>
13. Lestari, A., Hasiolan, A. B., & Minarsih, M. M. (2016). Pengaruh Sikap Mandiri, Lingkungan Keluarga dan Motivasi terhadap Minat Berwirausaha para Remaja (Studi Empiris di Desa Jamus Kecamatan Mranggen Kabupaten Demak). *Journal Of Management*, 2(2).
14. Mega, C., Ronconi, L., & De Beni, R. (2014). What makes a good student? How emotions, self-regulated learning, and motivation contribute to academic achievement. *Journal of Educational Psychology*, 106(1), 121–131. <https://doi.org/10.1037/a0033546>
15. Merchant, Z., Goetz, E. T., Cifuentes, L., Keeney-Kennicutt, W., & Davis, T. J. (2014). Effectiveness of virtual reality-based instruction on students' learning outcomes in K-12 and higher education: A meta-analysis. *Computers & Education*, 70, 29–40. <https://doi.org/https://doi.org/10.1016/j.compedu.2013.07.033>
16. Moore, K. D. (2014). *Effective Instructional Strategies: From Theory To Practice*. Sage Publications.
17. Morris, T. H. (2020). Experiential learning – a systematic review and revision of Kolb's model. *Interactive Learning Environments*, 28(8), 1064–1077. <https://doi.org/10.1080/10494820.2019.1570279>
18. Nortvig, A. M., Petersen, A. K., & Balle, S. H. (2018). A Literature Review of the Factors Influencing E-Learning and Blended Learning in Relation to Learning Outcome, Student Satisfaction and Engagement. *Electronic Journal of E-Learning*, 16(1), 46–55. www.ejel.org
19. Orphanos, S., & Orr, M. T. (2013). Learning leadership matters: The influence of innovative school leadership preparation on teachers' experiences and outcomes. *Educational Management Administration & Leadership*, 42(5), 680–700. <https://doi.org/10.1177/1741143213502187>
20. Rahman, N. J. (2018). Pengaruh Sikap, Norma Subjektif, Persepsi Kontrol Perilaku, dan Intensitas Moral terhadap Intensi Karyawan Melakukan Tindakan Pengungkapan Kecurangan

- (Whistleblowing)(Studi Empiris Pada Karyawan BUMD Kabupaten Temanggung) [Skripsi]. Universitas Muhammadiyah Magelang.
21. Richter, M., Gendolla, G. H. E., & Wright, R. A. (2016). Chapter Five – Three Decades of Research on Motivational Intensity Theory: What We Have Learned About Effort and What We Still Don't Know. In A. J. Elliot (Ed.), *Advances in Motivation Science* (Vol. 3, pp. 149–186). Elsevier. <https://doi.org/https://doi.org/10.1016/bs.adms.2016.02.001>
 22. Ryan, G., Toohey, S., & Hughes, C. (1996). The purpose, value and structure of the practicum in higher education: a literature review. *Higher Education*, 31(3), 355–377. <https://doi.org/10.1007/BF00128437>
 23. Simbolon, N. (2013). Faktor-Faktor Yang Mempengaruhi Minat Belajar Peserta Didik. *ESJ: Elementary School Journal PGSD FIP UNIMED*, 1(2). <https://doi.org/https://doi.org/10.24114/esjgsd.v1i2.1323>
 24. Sutrisno, V. L. P., & Siswanto, B. T. (2016). Faktor-Faktor Yang Mempengaruhi Hasil Belajar Siswa Pada Pembelajaran Praktik Kelistrikan Otomotif SMK di Kota Yogyakarta. *Jurnal Pendidikan Vokasi*, 6(1), 111–120. <https://doi.org/https://doi.org/10.21831/jpv.v6i1.8118>
 25. UU RI No. 20 Tahun 2003 Tentang Sistem Pendidikan Nasional, Pub. L. No. 20, Undang-Undang Republik Indonesia (2003).
 26. Yulianan, K. D., Nyoman, D., & Widiartini, N. K. (2018). Analisis Determinasi Kompetensi Pengelola dan Intensitas Menggunakan Laboratorium terhadap Keterampilan Mengoperasikan Mesin Balancing Ditinjau dari Bakat Mekanik pada Mahasiswa Teknik Mesin Undiksha. *Jurnal Penelitian dan Evaluasi Pendidikan Indonesia*, 8(2). <https://doi.org/https://doi.org/10.23887/jpepi.v8i2.2740>