Jurnal Pendidikan Vokasi
Vol. 10, No 1, February 2020

9 772476 940005

9 772088 286003

JURNAL PENDIDIKAN VOKASI
Volume 10, No 1, February 2020

Volume 10, No 1, February 2020
ISSN 2088-2866 (print)
ISSN 2476-9401 (online)

JURNAL PENDIDIKAN VOKASI

Indexed in Sinta 2 by Ministry of Research and Technology/National Research and Innovation Agency of the Republic of Indonesia
Under the Decree No: 85/M/KPT/2020, on 1 April 2020

ADGVI
ASOSIASI DOSEN & GURU VOKASI INDONESIA
IN COOPERATION WITH
GRADUATE SCHOOL OF
UNIVERSITAS NEGERI YOGYAKARTA

JURNAL PENDIDIKAN VOKASI

Publisher:
Asosiasi Dosen dan Guru Vokasi Indonesia (ADGVI)
in Coopertaion with
Graduate School of Universitas Negeri Yogyakarta

Correspondence: Graduate School of Universitas Negeri Yogyakarta
Kampus Karangmalang, Yogyakarta, 55281,
Telp. (0274) 550835, Fax. (0274) 520326
Homepage: **http://journal.uny.ac.id/index.php/jpv** e-mail: **jpvokasi@uny.ac.id**

Volume 10, No 1, February 2020

ISSN 2088-2866 (print)
ISSN 2476-9401 (online)

JURNAL PENDIDIKAN VOKASI

Jurnal Pendidikan Vokasi publishes three issues a year
in February, June and November
disseminating the result of scientific studies and research

Indexed in Sinta 2 by Ministry of Research and Technology/National Research and Innovation Agency of the Republic of Indonesia Under the Decree No: 85/M/KPT/2020, on 1 April 2020

ADGVI
ASOSIASI DOSEN & GURU VOKASI INDONESIA
IN COOPERATION WITH
GRADUATE SCHOOL OF
UNIVERSITAS NEGERI YOGYAKARTA

Jurnal Pendidikan Vokasi
Vol. 10, No. 1, February 2020

Jurnal Pendidikan Vokasi
Volume 10, No. 1, 2020 (1-9)
Online: http://journal.uny.ac.id/index.php/jpv

QUALITY ANALYSIS OF TEACHER-MADE TESTS IN FINANCIAL ACCOUNTING SUBJECT AT VOCATIONAL HIGH SCHOOLS

Heni Mulyani[1*], Heraeni Tanuatmodjo[1], Rangga Iskandar[1]
[1]Universitas Pendidikan Indonesia
Jl. Dr. Setiabudi No.229, Isola, Sukasari, Kota Bandung, Jawa Barat 40154, Indonesia

Abstract

Assessment of student learning outcomes needs to be done using tests that meet the criteria for quality tests. This study aims to determine the quality of teacher-made tests on financial accounting subjects in Vocational High Schools. This research is descriptive research with a quantitative approach. Data collected are questions made by 32 teachers, answer sheets from 689 Accounting students. The validity of objective and essay tests using product-moment correlation. Reliability of the objective test using the KR20 formula, while the essay test using Alpha formula. Difficulty level and distinguishing power of objective tests using Anates 4. Difficulty level and distinguishing power of essay tests used Microsoft Excel 2013. The research results obtained are as follows: (1) validity of teacher-made test items cannot accurately measure learning outcomes; (2) reliability of teacher-made tests cannot show stable results despite repeated testing of the same subject; (3) teacher-made tests do not have a proportion of degree of difficulty that is suitable for use as a Mid-Semester assessment tool; (4) distinguishing power of tests made by teachers cannot distinguish students who have mastered the test material (upper or superior group) from students who have not mastered the test material (lower group or user); (5) Multiple choice test distractors made by teachers are not evenly chosen, and the key options and deception options do not function effectively. Quality analysis of teacher-made tests through item analysis is intended to identify damaged test items and to show areas that are already mastered by students.

Keywords: *teacher-made test, test quality, financial accounting, reliability, validity*

How to cite: Mulyani, H., Tanuatmodjo, H., & Iskandar, R. (2020). Quality analysis of teacher-made tests in financial accounting subject at vocational high schools. *Jurnal Pendidikan Vokasi, 10*(1), 1-9. doi:https://doi.org/10.21831/jpv.v10i1.29382

***Corresponding Author:** Heni Mulyani henimulyani@upi.edu
Department of Accounting Education, Faculty of Economics and Business Education, Universitas Pendidikan Indonesia
Jl. Dr. Setiabudi No.229, Isola, Sukasari, Kota Bandung, Jawa Barat 40154, Indonesia

https://doi.org/10.21831/jpv.v10i1.29382

INTRODUCTION

Based on a review of research results on teacher-made tests (Ashtiani & Babaii, 2007; Carroll & Moody, 2006; Marso & Pigge, 1991), several problems were found: (1) teachers view tests designed by the teacher as positively affecting teaching and learning; (2) most of the tests developed by teachers contained many errors; and (3) teachers usually do not use test improvement strategies such as test blueprints or item analysis. Teacher-made tests are usually tests that refer to the teacher's criteria to assess and evaluate student mastery of certain knowledge (Wiggins, 1989). Research on teacher-made tests has been carried out by researchers in various countries, including Notar et al. (2004), DiDonato-Barnes et al. (2014), and Ing et al. (2015) who examined the use of specification tables to present the validity of teacher-made tests. Meanwhile, Kinyua and Okunya (2014) investigated not only the validity of teacher-made tests but also their reliability. In compareson, Quaigrain and Arhin (2017) evaluate tests developed by teachers using reliability and item analysis. These studies are basically conducted to assess the quality of teacher-made tests, as stated by Walker et al. (2004) that well-made and well-managed teacher-made tests can provide evidence of quality learning and teaching. Given the test's prevalence as a very common means of determining student learning, it is necessary to focus on the characteristics and basic principles to build a good test for the class (Grant & Gareis, 2015).

The assessment of students' success in mastering learning material carried out in class is done by the teacher using tests. Wiggins (1989) says that teacher-made tests usually refer to criteria designed by the teacher to assess and evaluate student mastery of certain knowledge. Before the test that has been made by the teacher is used to assess students, several criteria must be met so the test meets the criteria for quality tests. Validity is an attribute to deduce the validity of a test based on a score and requires the use of a test score. On the other hand, an instrument-based approach states that the test is either inherently valid or invalid (Kinyua & Okunya, 2014). Formative validity seeks to determine the extent to which a test's ability can provide information that can help improve the way to achieve the goals of a program. For example, in an assessment for learning, the aim is to gather the information that will improve teaching methods that benefit students (Clark, 2008).

Reliability is one of a series of test scores that shows the number of measurement errors associated with the score. Teachers should know about reliability so they can use test scores to make the right decisions about their students. Frisbie (1988) stated that the level of consistency of a set of scores can be predicted using internal analysis methods to calculate the reliability coefficient. Meanwhile, Meshkani and Abadie (2005) declared that test reliability refers to the conditions to which the instrument can produce the same results in repeated trials or the tendency towards consistency found in repeated measurements is called reliability.

However, Heyneman and Fägerlind (1988) explained that the requirements that must be met to make a quality test are not only limited to the validity and reliability of the questions, but other requirements that must be met are also difficulty level, distinguishing power, and effectiveness of distractors. The main purpose of item analysis in a teacher-made test is to identify deficiencies in the test or in learning. Teacher-made tests that have not been analyzed can reduce the quality of the tests themselves, because deficiencies in teacher-made tests have not been detected before use. The deficiencies in teacher-made tests can obscure information on the level of student learning progress. This information should not be used to make decisions related to learning. Thus, the impact of teacher-made tests that have not been analyzed should be eliminated. Nevertheless, studies of the quality of teacher-made tests still examine the scope of validity, reliability of the questions, and difficulty levels, such as the study of Notar et al. (2004), DiDonato-Barnes et al. (2014), Cooper et al. (2014), Kinyua and Okunya (2014), Khairani and Shamsuddin (2016), and Quaigrain and Arhin (2017). Thus, this study is to examine the quality of teacher-made tests by analyzing the five criteria: validity, reliability, difficulty level, distinguishing power, and effectiveness of distractors.

RESEARCH METHOD

This research was a descriptive study with a quantitative approach. This study's population was a test made by financial accounting teachers in 32 Vocational High Schools majoring in Ac-

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29382

counting. The sample in this study was the same as the population, so this study uses a census. The technique used in collecting research data was the documentation technique. The data were generated from 32 teachers' tests, answer sheets from 689 students in class XI Accounting, assessment guidelines, and answer keys for midterm assessment in financial accounting subjects for the academic year 2017/2018. There were 302 items analyzed, consisting of 129 items (42.72%) of multiple-choice tests made by teachers and 173 items (57.28%) essay tests with teachers' limited answers.

Testing the validity of items was done using the Anates 4 application. The formula used to test the validity of objective test items and essay test items is the product-moment correlation formula. The reliability test was carried out using Microsoft Excel 2013. The formula used to test the reliability of the objective test was the KR20 formula. The formula used to test the reliability of essay tests was the Alpha formula. Difficulty level testing on objective tests was done using Anates 4. Difficulty level testing on essay tests was done using Microsoft Excel 2013. The formula used was adjusted according to the form of the test.

Distinguishing power testing on objective tests was done using the Anates 4 application. Distinguishing power testing on essay tests was carried out using Microsoft Excel 2013. The formula used was adjusted according to the form of the test. The deception of quality testing is carried out using the Anates 4 application. To determine the deception quality used the deception index formula. To increase the accuracy of the test results, the effectiveness of the option function was tested. The effectiveness of the option function is analyzed using Microsoft Excel 2013.

The provisions used to determine the effectiveness of key options are as follows: (1) The number of voters in the upper and lower groups is between 25% - 75%. The test was carried out using the following formula:

$$\frac{\sum PKA + \sum PKB}{n_1 + n_2} \; x \; 100\%$$

Annotation:

∑PKA = the number of top group voters; ∑PKB = the number of voters in the lower class; n_1= the number of sample groups above (27%); n_2 = the number of sample groups below (27%).

(2) The number of voters in the upper group must be greater than the number of voters in the lower group. The provisions used to determine the effectiveness of fraud options are as follows: (a) The number of voters in the upper and lower groups is not more than $= 25\% \text{ x} \frac{1}{2\ (\sum d)} \text{ x } (Ka + Kb)$. (b) The number of voters in the lower class must be greater than the number of voters in the upper group.

Annotation:

d= number of deception options; *Ka* = top group; *Kb* = bottom group.

RESULTS AND DISCUSSION

Results

The description of the results of the analysis of the quality of tests made by accounting teachers are as follows.

Item Validity

The results of the analysis of the validity of multiple-choice test items show that 129 multiple choice test items made by teachers in financial accounting subjects, there were 40 items (31.01%) declared valid, while the remaining 89 items (68.99%) were declared invalid. The results of the analysis of the validity of essay test items with limited answers showed that 173 items essay test questions with limited answers made by teachers on financial accounting subjects, there were 124 items (71.68%) was declared valid, while the remaining 49 items (28.32%) were declared invalid.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29382

Reliability

The results of the analysis of the reliability of multiple-choice tests show that among the 129 multiple choice test items made by teachers in financial accounting subjects, there were 21 items (16.28%) declared reliable while the remaining 108 items (83.72%) were declared unreliable. The results of the analysis of the reliability of essay tests with limited answers showed that 173 items essay test questions with limited answers made by teachers in financial accounting subjects, there were 108 items (62.43%) declared reliable, while the remaining 65 items (37.57%) were declared unreliable.

Difficulty Level

Difficulty level analysis should be done on teacher-made tests. If it is related to this research object, the mid-semester assessment should be built from items with a moderate degree of difficulty. Thus a quality teacher-made test for mid-semester assessment needs to be constructed from items with a moderate degree of difficulty or at least the proportion of items with a moderate degree of difficulty than the proportion of difficult and easy items. Based on the analysis of the level of difficulty, it can be seen that in general, the teacher-made tests on financial accounting subjects do not have a proportion of degree of difficulty that is feasible to be used as a mid-semester assessment. The results of the analysis of the difficulty level of multiple-choice tests show that 129 items of multiple-choice test questions made by teachers in financial accounting subjects, there are 28 items (21.71%) declared difficult, 39 items (30.23%) were stated to have a moderate level of difficulty, while the remaining 62 items (48.06%) were declared easy. Based on the results of the analysis, it can be seen that the proportion of items with a moderate degree of difficulty on teacher-made compound choice tests on financial accounting subjects is not greater than the proportion of difficult and easy items. The results of the analysis of the difficulty level of essay tests with limited answers showed that 173 items essay test questions with limited answers made by teachers in financial accounting subjects, there were 17 items (9.83%) declared difficult, 39 items (22.54%) were stated to have a moderate level of difficulty, while the remaining 117 items (67.63%) were declared easy. Based on the results of this analysis, it can be seen that the proportion of items with a moderate degree of difficulty on essay tests with limited answers made by teachers on financial accounting subjects is no greater than the proportion of difficult and easy items.

Distinguishing Power

Based on the results of the analysis of distinguishing power, it can be seen that in general, teacher-made tests on financial accounting subjects cannot distinguish students who have mastered the test material (upper or superior) and students who have not mastered the test material (lower group).

The results of the analysis of the differentiation power of multiple-choice tests showed that of 129 multiple choice test items made by teachers in financial accounting subjects, there were 54 items (41.86%) declared to have power an adequate differentiator, while the remaining 75 items (58.14%) were declared not to have adequate distinguishing power. The results of the analysis of distinguishing essay tests with limited answers showed that of the 173 items essay test questions with limited answers made by teachers in financial accounting subjects, 108 items (62.43 %) was stated to have adequate distinguishing power, while the remaining 65 items (37.57%) were stated not to have sufficient differentiating power.

Effectiveness of Distractor

When referring to the results of the analysis of deception quality, it can be seen that the proportion of distractors who have poor quality is 224 deception (43.41%), which is the largest proportion of deception quality. In addition, 52 outfits (10.08%) were also found of unknown quality. If all test takers choose a key option, and no one chooses the deception provided, the deception option's quality cannot be known. This is due to the ease of the questions so that test-takers can easily choose the key options and ignore the deception options provided.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29382

Suppose the results of the analysis of the quality of the deception are related to the results of the analysis of the effectiveness of the deception options. In that case, it can be seen that the large proportion of the quality of the deceiters is bad. The presence of options of unknown quality has caused the proportion of distractors who are declared not to function as effectively as 342 deception options (66.28%) is greater than the deception option declared effective, that is, 174 deception options (33.72%). In general, the deception options do not function effectively because the number of deception options voters in the lower group is not greater than the number of deception options voters in the upper group. This shows that the deception option cannot outwit students who have not yet mastered the test material (lower group). Besides, generally, the deceptive option sentences are not homogeneous.

When referring to the results of the analysis of the effectiveness of the function of the key options, it can be seen that the proportion of ineffective key options is 74 key options (57.36%) greater than the declared effective key options, which are 55 key options (42.64%). This shows that the key options provided are not able to direct test participants to the correct answers. In general, the key options for multiple-choice tests made by teachers of financial accounting subjects are not well organized. This is due to the ineffective preparation of key option sentences, which results in different interpretations among test takers. In addition, the large proportion of ineffective key options is also influenced by the existence of answer keys that are not relevant to the question matter. There are 17 key options that are not relevant to the question matter.

Discussion

Learning outcomes test is declared valid if the test can measure learning outcomes appropriately, as Kinyua and Okunya (2014) stated that referring to the simplest point of view, a test can be judged valid if it measures what is meant to be measured. Nordin (2002) stated that valid tests can lead to information or grades taken to help teachers and students make judgments, conclusions, and figures of speech about achievement quality. Analysis of the validity of items should be conducted on teacher-made tests. Learning outcome assessment data must be obtained in accordance with reality. Popham (2009) stated that good evaluation data in accordance with reality are called valid data, to obtain valid data, the instrument or tool to evaluate it must be valid. Thus all items made by teacher tests must be declared valid in order to become a quality test. Based on the results of the analysis of the validity of the items, it can be seen that in general, teacher-made tests on financial accounting subjects cannot measure learning outcomes accurately. Factors that influence teacher-made tests on financial accounting subjects are not all valid, namely the item validity index is not greater than and is influenced by factors related to questions and answer keys. Weaknesses of teacher-made tests that do not meet the item validity requirements can be avoided if the teacher has carried out an item validity analysis before the test is used. In addition, teachers need to optimize the factors that affect the validity of test results. Winter et al. (2006) explained that there are several factors that affect the validity of test results, including the evaluation instrument, evaluation and scoring administration factors, and student response factors. The teacher can use data items that are not valid as a reference to correct deficiencies in the evaluation instrument. In relation to the administrative factors of evaluation, the results of the analysis of the validity of the items can be used as a reference to study the allocation of time given. In relation to student answers, the teacher should provide answer sheets. Besides, Black et al. (2010) stated that teachers can respond to problems of validity by reflecting on their values and by engaging in the joint development of portfolio assessments.

Whereas, learning outcomes tests are declared to be reliable if the tests can show stable results even though they are repeatedly tested on the same subject. As Grant and Gareis (2015) explained, a good instrument is an instrument that can consistently provide data that is in accordance with reality. Thus, the teacher-made test must be declared reliable or consistent in order to become a quality test. Parkes (2013) stated that basically, the reliability measurement principles reveal the consistency of test-takers or assessors throughout the measurement opportunity. Based on the reliability analysis results, it can be seen that in general, teacher-made tests on financial accounting subjects cannot show stable results despite repeated testing of the same subject. The

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29382

factors that influence essay tests with limited answers made by teachers on financial accounting subjects are not reliable, namely, the test reliability coefficient (r_{11}) is not greater than r_{table}. In addition, there are factors that influence the reliability of the test related to the test itself. This is relevant to the opinion of Levy and Goldstein (2014) that reliability can be influenced by matters relating to the test itself, namely the length of the test and the quality of the problem items. The length of the test relates to the number of test items. The more the number of items, the more steady a test becomes. Weaknesses of teacher-made tests that do not meet the test reliability requirements can be avoided if the teacher has conducted a test reliability analysis before the test is used. In addition, if the teacher wants to increase the number of test items in order to optimize the test reliability coefficient (r_{11}), then the addition of the number of items needs to pay attention to the quality of the items.

The factors that influence essay test with limited answers made by teachers on financial accounting subjects are not reliable, namely, the test reliability coefficient (r_{11}) is not greater than r_{table}. In addition, some factors influence the reliability of the test related to the test itself. This is relevant to Arikunto (2012) opinion that reliability can be influenced by matters relating to the test itself, namely the length of the test and the quality of the problem items. The length of the test relates to the number of test items. The more the number of items, the more steady a test. Weaknesses of teacher-made tests that do not meet the test reliability requirements can be avoided if the teacher has conducted a test reliability analysis before the test is used (Kusaeri & Suprananto, 2012). In addition, if the teacher wants to increase the number of test items to optimize the test reliability coefficient (r_{11}), then the addition of the number of items needs to pay attention to the quality of the items. Linn and Gronlund (2000) suggested that the general definition of the reliability principle stated that reliability means the extent to which measurement tools can produce consistent readings.

Besides, the weaknesses of teacher-made tests that do not meet the difficulty level requirements can be avoided if the teacher has carried out an analysis of the difficulty level of items before the test is used. To obtain tests with a proportion of items with a moderate degree of difficulty greater than the proportion of difficult and easy items, the teacher can use the provisions of the proportion of difficulties that are normally distributed.

Wright (2007) clarified the optimal difficulty for each item depends on the teacher's assessment and testing objectives, it is known that for the purpose of selection, items used that have a high degree of difficulty, and for diagnostic purposes are usually used items that have a low level of difficulty/easy. Therefore difficult and easy items can be reused as needed. Meanwhile, according to Nordin (2002), an item's difficulty illustrates the percentage of students who can answer an item correctly.

Other than that, a distinguishing analysis should be done on teacher-made tests. Items of learning achievement test items must be able to provide test results that reflect differences in abilities found among the testees. If the item discrimination index is interpreted as being moderate, good, and very good, then it can be concluded that it has adequate differentiation of items. On the contrary, if the item discrimination index is interpreted poorly, then it can be concluded that it does not yet have the distinguishing power of items as expected. To be able to be concluded that it has sufficient differentiation of items, the total proportion of items that are stated to have moderate, good, and excellent differentiation must reach 100%. Thus quality teacher-made tests need to be built from items that have adequate differentiation.

Factors influencing items that cannot distinguish students' abilities are (a) the key to the item answer is incorrect; (b) the item has two or more correct answer keys; and (c) the deception doesn't work. Weaknesses of teacher-made tests that do not meet the distinguishing power requirements can be avoided if the teacher has carried out a distinguishing power analysis before the test is used. In addition, the teacher can determine the appropriate action on the results of the analysis of the power of differentiation. First, for items with sufficient differentiation (having moderate, good, and excellent differentiation), the teacher can put them in the question bank for reuse or development. Second, for items with poor differentiation, the teacher can choose to discard them or explore the factors that cause the differentiation of items to be bad. If the causative factor has been found, the

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29382

item can be fixed and used for the next test. Third, for items with very poor distinguishing features, it should be discarded. This is relevant to the follow-up that needs to be done by a tester of the analysis results of distinguishing power (Sudijono, 2015).

Qualified teacher-made tests for multiple-choice need to be built from items with evenly chosen deceivers, meaning that the deceivers have very good or good quality. In addition, to increase accuracy, key options, and deception options should be declared to function effectively (Reynolds et al., 2010). Based on the results of the analysis of the distractors' effectiveness, it can be seen that in general, the multiple-choice test distractors made by financial accounting teachers were not evenly selected, and not all key options and deception options were declared to be functioning effectively.

Weaknesses of teacher-made tests that do not meet the requirements of the distractor's effectiveness can be avoided if the teacher has carried out an analysis of the effectiveness of the distractor before the test is used. The teacher can also determine the right action on the results of the analysis of the effectiveness of the distractor. First, for items with evenly selected distractors and key options and deception options to function effectively, the teacher can put them in the question bank for reuse or development. Second, for items with distractors that are not evenly selected, and key options and deception options are not functioning effectively, the teacher can choose to fix them or replace them with new distractors. Hamzah and Abdullah (2011) stated that a distracter is said to be effective if the candidate, who does not know the answer, chooses the distracter as the answer.

Therefore, Lee and Lee (2013) and Young and Kim (2010) explained that teacher-made tests that have not been analyzed can reduce the tests themselves' quality because deficiencies in teacher-made tests have not been detected before use. The deficiencies in teacher-made tests can obscure information about the level of student learning progress. This information should not be used to make decisions related to learning. Thus the overall analysis of these items is a stage that must be done by the teacher as the opinion of Mitra et al. (2009), item analysis is the process of gathering, summarizing, and using information from student responses to assess the quality of test items. The resulting item statistics can be used to determine good items that need to be repaired or deleted from the question bank. Whereas according to Bichi (2015), the two objectives of the Item analysis are; firstly, to identify defective test items and secondly, to indicate subject matter that students have and have not mastered.

CONCLUSION

Based on the research findings, some conclusions are drawn as follows. (1) The validity of teacher-made test items on financial accounting subjects cannot measure learning outcomes accurately. In the multiple-choice test sample, the proportion of items that were declared valid was 31.01%, whereas, in the essay test sample with limited answers, the proportion of items that were declared valid was 71.68%. (2) The reliability of teacher-made tests on financial accounting subjects could not show stable results despite repeated testing of the same subject. In the multiple-choice test sample, the proportion of sample units that were declared reliable was 16.67%, whereas, in the essay test sample with limited answers, the proportion of sample units that were declared reliable was 62.50%. (3) Teacher-made tests on financial accounting subjects do not have a proportion of the degree of difficulty that is feasible to be used as a Mid-Semester Assessment Tool. In the multiple-choice test sample and essay test with limited answers, the proportion of items with moderate difficulty level is not greater than the proportion of difficult and easy items. (4) The distinguishing power of teacher-made tests in financial accounting subjects cannot distinguish students who have mastered the test material (upper or superior group) from students who have not mastered the test material (lower group). In the multiple-choice test sample, the proportion of items that were stated to have adequate distinguishing power was 41.86%, whereas, in the essay test sample with limited answers, the proportion of items that were stated to have adequate distinguishing power was 62.43%. (5) The multiple-choice test distractor made by teachers in financial accounting subjects was not evenly chosen, and the key options and deception options were declared ineffective. Thus, teachers need to optimize their competence in preparing

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29382

the test, taking into account the factors of quality teacher-made tests, namely item validity, reliability, difficulty level, distinguishing power, and distractor effectiveness.

ACKNOWLEDGMENT

Acknowledgments and awards are given to the colleagues of the Department of Accounting Education of Universitas Pendidikan Indonesia for providing advice, assistance, and convenience.

REFERENCES

Arikunto, S. (2012). *Dasar-dasar evaluasi pendidikan*. Bumi Aksara.

Ashtiani, N. S., & Babaii, E. (2007). Cooperative test construction: The last temptation of educational reform? *Studies in Educational Evaluation*, *33*(3–4), 213–228. https://doi.org/10.1016/j.stueduc.2007.07.002

Bichi, A. A. (2015). Item analysis using a derived science achievement test data. *International Journal of Science and Research (IJSR)*, *4*(5), 1656–1662.

Black, P., Harrison, C., Hodgen, J., Marshall, B., & Serret, N. (2010). Validity in teachers' summative assessments. *Assessment in Education: Principles, Policy & Practice*, *17*(2), 215–232. https://doi.org/10.1080/09695941003696016

Carroll, T., & Moody, L. (2006). Teacher-made tests. *Science Scope*, *September*, 66. https://www.questia.com/library/journal/1G1-153041130/teacher-made-tests

Clark, I. (2008). Assessment is for learning: Formative assessment and positive learning interactions. *Florida Journal of Educational Administration & Policy*, *2*(1), 1–16.

Cooper, T., Ashley, P., & Simona, W. (2014). Using reliability, validity, and item analysis to evaluate a teacher-developed test in international business. *Evaluation and Testing Research Article*, 1–11.

DiDonato-Barnes, N., Fives, H., & Krause, E. S. (2014). Using a table of specifications to improve teacher-constructed traditional tests: an experimental design. *Assessment in Education: Principles, Policy & Practice*, *21*(1), 90–108.

Frisbie, D. A. (1988). Reliability of scores from teacher-made tests. *Educational Measurement: Issues and Practice*, *7*(1), 25–35.

Grant, L., & Gareis, C. (2015). *Teacher-made assessments: How to connect curriculum, instruction, and student learning*. Routledge.

Hamzah, M. S. G., & Abdullah, S. K. (2011). Test item analysis: An educator professionalism approach. *US-China Education Review*, *A*(3), 307–322.

Heyneman, S. P., & Fägerlind, I. (1988). *University examinations and standardized testing: Principles, experience, and policy options*. World Bank.

Ing, L. M., Musah, M. B., Al-Hudawi, S. H., Tahir, L. M., & Kamil, N. M. (2015). Validity of teacher-made assessment: A table of specification approach. *Asian Social Science*, *11*(5). https://doi.org/10.5539/ass.v11n5p193

Khairani, A. Z., & Shamsuddin, H. (2016). Assessing item difficulty and discrimination indices of teacher-developed multiple-choice tests. In *Assessment for learning within and beyond the classroom* (pp. 417–426). Springer Singapore. https://doi.org/10.1007/978-981-10-0908-2_35

Kinyua, K., & Okunya, L. O. (2014). Validity and reliability of teacher-made tests: Case study of year 11 physics in Nyahururu district of Kenya. *African Educational Research Journal*, *2*(2), 61–71.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29382

Kusaeri, K., & Suprananto, S. (2012). *Pengukuran dan penilaian pendidikan*. Graha Imu.

Lee, J., & Lee, Y. S. (2013). Effects of testing. In J. Hattie & E. M. Anderman (Eds.), *International guide to student achievement* (pp. 416–418). Routledge.

Levy, P., & Goldstein, H. (2014). *Tests in education: A book of critical reviews*. Academic Press.

Linn, R. L., & Gronlund, N. (2000). *Measurement and assessment in teaching* (8th ed.). Prentice-Hall.

Marso, R. N., & Pigge, F. L. (1991). An analysis of teacher-made tests: Testing practices, cognitive demands and item construction errors. *Contemporary Educational Psychology, 16*, 279–286.

Meshkani, Z., & Abadie, F. H. (2005). Multivariate analysis of factors influencing reliability of teacher made tests. *Journal of Medical Education*, *6*(2), e105155. https://doi.org/10.22037/jme.v6i2.765

Mitra, N. K., Nagaraja, H. S., Ponnudurai, G., & Judson, J. P. (2009). The levels of difficulty and discrimination indices in type A multiple choice questions of pre-clinical semester 1 multidisciplinary summative tests. *IeJSME, 3*(1), 2–7.

Nordin, M. S. (2002). *Testing and interpreting in classrooms*. International Islamic University of Malaysia Publications.

Notar, C. E., Zuelke, D. C., Wilson, J. D., & Yunker, B. D. (2004). The table of specifications: Insuring accountability in teacher made tests. *Journal of Instructional Psychology, 31*(2). https://www.questia.com/library/journal/1G1-119611686/the-table-of-specifications-insuring-accountability

Parkes, J. (2013). Reliability in classroom assessment. In J. H. McMillan (Ed.), *SAGE handbook of research on classroom assessment* (pp. 107–123). SAGE Publications.

Popham, W. J. (2009). Assessment literacy for teachers: Faddish or fundamental? *Theory Into Practice*, *48*(1), 4–11. https://doi.org/10.1080/00405840802577536

Quaigrain, K., & Arhin, A. K. (2017). Using reliability and item analysis to evaluate a teacher-developed test in educational measurement and evaluation. *Cogent Education*, *4*(1), 1301013. https://doi.org/10.1080/2331186X.2017.1301013

Reynolds, C. R., Livingston, R. B., & Willson, V. (2010). *Measurement and assessment in education* (2nd ed.). Pearson Education.

Sudijono, A. (2015). *Pengantar evaluasi pendidikan*. Raja Grafindo Persada.

Walker, C. M., Schmidt, E., & Mototsune, K. (2004). *Smart tests: Teacher-made tests that help students learn*. Pembroke Publishers Limited.

Wiggins, G. (1989). A true test: Toward more authentic and equitable assessment. *Phi Delta Kappan*, *70*, 703–710.

Winter, P. C., Kopriva, R. J., Chen, C.-S., & Emick, J. E. (2006). Exploring individual and item factors that affect assessment validity for diverse learners: Results from a large-scale cognitive lab. *Learning and Individual Differences*, *16*(4), 267–276. https://doi.org/10.1016/j.lindif.2007.01.001

Wright, R. J. (2007). *Educational assessment: Tests and measurements in the age of accountability*. Sage Publications.

Young, V. M., & Kim, D. H. (2010). Using assessments for instructional improvement: A literature review. *Education Policy Analysis Archives*, *18*(19), 1–40. https://doi.org/10.14507/epaa.v18n19.2010

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

Jurnal Pendidikan Vokasi
Volume 10, No. 1, 2020 (10-21)
Online: http://journal.uny.ac.id/index.php/jpv

MOTIVATION AND SATISFACTION TOWARDS TWO-YEAR VOCATIONAL DIPLOMA

Tanzir Masykar[1], Febri Nurrahmi[2]*
[1]Akademi Komunitas Negeri Aceh Barat
Jl. Alue Peunyareng, Ujong Tanoh Darat, Meureubo, Aceh Barat, Aceh 23681, Indonesia
[2]Universitas Syiah Kuala
Jl. Teuku Nyak Arief No.441, Kopelma Darussalam, Syiah Kuala, Banda Aceh, Aceh 23111, Indonesia

Abstract

Lack of students enrolling in diploma programs compared to what occurred Germany is a sign that Indonesian high school graduates are discouraged from enrolling in the program. Previous studies have mostly focused on the perception and expectation toward vocational high school, leaving motivation and satisfaction under-researched. This study aims to look at the motivation of students enrolling at the two-year diploma and how satisfied they are with the program. Factors contributing to their satisfaction would be presented accordingly. The study used a qualitative research approach with a case study design by examining current students at AKN Aceh Barat. A focus group discussion coupled with interview were employed to obtain the data and a total of 23 first year diploma students participated in the study. The study found that students were encouraged to enroll for the diploma program due to practical skill benefit, short durational advantage, and financial constraints of their families. They valued practical skills over theoretical knowledge and a short time of study over four years in college. The financial constraint also implies that most students enrolled in the program originate from financially unfortunate families. Most students have been satisfied with the program indicating that their initial motivation has been fulfilled. Factors contributing to their satisfaction include practical skills, theoretical knowledge, laboratory facilities, building infrastructure, and the number of students. They have been satisfied with the balance between practical skills and theoretical balance offered by the program yet felt the need for improvement in the other areas.

Keywords: *motivation, satisfaction, vocational education, two-year diploma program, community college*

How to cite: Masykar, T., & Nurrahmi, F. (2020). Motivation and satisfaction towards two-year vocational diploma. *Jurnal Pendidikan Vokasi*, *10*(1), 10-21. doi:https://doi.org/10.21831/jpv.v10i1.30123

***Corresponding Author:** Febri Nurrahmi febri.nurrahmi@unsyiah.ac.id
Department of Communication Sciences, Faculty of Social and Political Sciences, Universitas Syiah Kuala
Jl. Tgk. Tanoh Abee, Kopelma Darussalam, Banda Aceh, Aceh, Indonesia

https://doi.org/10.21831/jpv.v10i1.30123

INTRODUCTION

Law of Republic of Indonesia No. 12 of 2012 on Higher Education defines vocational education as a higher education institution that prepares students for jobs with certain applied expertise from diploma to applied undergraduate program. The institution can be further extended to offer applied master and doctoral degrees. The law also classifies the Indonesian higher education system into six categories: university, institute, higher education school, polytechnic, academy, and community academy. All these six categories can offer vocational education programs, while polytechnic, academy, and community academy can only provide vocational education. Community academy such as *Akademi Komunitas Negeri* (AKN) Aceh Barat being at the bottom of the Indonesian higher education system could only provide a two-year diploma.

AKN Aceh Barat is one of three regional campuses in West Aceh that have been nationalized by the Ministry of Research and Technology and Higher Education in 2014. The central government awarded national state status to three existing higher education institutions in West Aceh, namely Universitas Teuku Umar (UTU), *Sekolah Tinggi Agama Islam Negeri* (STAIN) Teungku Dirundeng, and AKN Aceh Barat. These three higher institutions have different focuses and purposes and do not seem to overlap over each other. While UTU and STAIN offer courses at the undergraduate level, AKN Aceh Barat focuses on the two-year diploma. UTU offers mainstream courses such as engineering, health, and also social sciences (Universitas Teuku Umar, 2019), and STAIN Dirundeng offers Islamic courses in Islamic education and social sciences (STAIN Dirundeng, 2019). On the other hand, AKN Aceh Barat, despite offering a diploma in engineering, aims to produce ready-to-work workforces for regional needs (AKN Aceh Barat, 2019). Therefore, its prospective students differ from the two higher education.

However, while the number of students applying for UTU has increased significantly and steadily for STAIN each year, AKN Aceh Barat failed to experience similar advantages. It is seen in the number of students applying for this vocational education in 2019. There were only 85 students enrolled at three engineering diplomas offered in AKN; most of whom received financial funding by the government through *Bidikmisi* scholarship. Such low interest to enroll in vocational education has been observed by Majid (2012) in his study suggesting the interest of more than 70% of respondents was generally categorized as medium.

Most classes at AKN Aceh Barat only has 20 students at most and 10 at least. Even though the size of the class seems ideal in European standards at around 15 students for small class and 22 students in the average (Chingos & Whitehurst, 2011), it is far below what the non-diploma higher institutions in Indonesia have in their classes. Despite the hype of the current reshuffle in Indonesian cabinet and enthusiast of academic actors in vocational education (Utami, 2019), this phenomenon very much depicts how low community interest is in higher education diplomas. It is very different from Germany as the industry leader in vocational education in which almost half of its population (47.2%) held a degree in vocational training (Spees, 2018).

A low number of students enrolled at the community academy must have something to do with the community perception and motivation to study for higher education. Previous studies have reported how the lack of vocational school's laboratory facilities (Hermanto et al., 2019) has lower student motivation to work well in class (Setiawati & Sudira, 2015). The constraint in community perception and interest continue to prevail, as suggested by Saputri, Artana, and Haris (2013). Positive community perception toward diploma is crucial to attract stu-dents enrolling at vocational education. Parents in this regard play a central role in encouraging their children to study after high school to higher vocational education. Wulandari, Putro, and Rahmawati (2015) found that parents' perception of vocational high school influenced their children's decision to enroll at vocational high school. Students would tend to continue their next education based on parent consideration. Thus, promoting positive images of vocational education in the eye of the local community would help trigger community interest to let their children con-tinue their studies to vocational education. Some studies have tried investigating the community perception toward vocational education (Fatahillah & Triyono, 2019; Saputri et al., 2013), but none has been done toward higher education.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30123

Previous studies on perception have produced mixed results under various themes such as perception (Sriwardani, 2011; Sunarko, 2009), expectation, interest, and image of vocational education (Wulandari et al., 2015). Meanwhile, Wulandari et al. (2015) and Saputri et al. (2013) used third-year secondary students to measure perception, Sunarko (2009) distributed his questionnaire to the third year vocational high school students. Sunarko (2009) was among the first to study the perception of vocational high schools. His study was a school self-evaluation to see how good the vocational high schools perceived by their students. In his study, 267 students from eight vocational high schools in Trenggalek were asked to fill a series of a questionnaire focusing on the institution, professionalism, competence, educational and training system, and graduates. He found that most students believed that the vocational high school has met their expectations in all off the six categories. His study is in line with Saputri et al. (2013) and Wulandari et al. (2015) in which students have positive images of vocational high schools.

Looking at a similar theme, student perception, Saputri et al. (2013) compared the perception of third-year students of two diferent secondary schools. Their findings seemed to contradict their initial belief that secondary students did not want to continue their studies to vocational high school (Saputri et al., 2013). They also argued that vocational high schools are often associated with low performer students and those who only want to work and do not intend to continue their studies to higher education levels. To their surprise, 204 students from both secondary schools perceived vocational high schools in positive ways. They found that all five categories they studied; function, study program, practical learning system, graduate outcomes, and the graduate prospect of vocational high school scores were relatively high. Though both schools gave slightly different values, the overall perception was the same. Similar to the study by Sunarko (2009), Saputri et al. (2013) focused only on vocational high schools, leaving the higher education diploma under-researched. Despite the fact that students have a positive image, the students' interest in studying at vocational education is unknown. It would be interesting to see how their perception eventually influenced their interest in studying at vocational high schools.

In the latter study, Wulandari et al. (2015) attempted to find how the interplay between parents' perception, student expectation, perception toward graduates affected student interest to study at vocational high schools. They found that both parent and student perceptions significantly influenced students' decisions over their study options. Expectation also played a central role in shaping their decisions whether to study at vocational high schools. They also measured parents' perceptions from evaluation and absorption indicators. However, they failed to provide any clear description of how they used both variables to indicate the parents' perception. They merely explained that parents first received information about a particular vocational high school and evaluated the information before making their decision whether to send their children to vocational high schools.

Current research by Fatahillah and Triyono (2019) also puts the weight on the importance of employability by studying the special job market perception among vocational high school graduates. They investigated how vocational high school graduates in Langsa perceived a special job market in four aspects; performance, role, service, and success of a special job market. Their study found that all 55 students participated in the study rated highly either for satisfied and very satisfied categories on all aspects and none rated for dissatisfied and quite dissatisfied. The positive rating given by students indicated that workability through a career center is extremely significant to vocational students. Such employability could be reached by ensuring the quality of graduates. The actual quality of vocational education should meet the students' expectations and perceptions. It should be further linked to the labor market in order to increase the employability of vocational students. A more recent study by Ishak and Sukirman (2019) also found a strong correlation between expectations and perception and the actual quality of vocational education.

Most previous studies have looked at how vocational education is perceived by either junior or senior high school students (Saputri et al., 2013; Sunarko, 2009), while other research focused on the perception of institution body outside vocational education also using high school students (Fatahillah & Triyono, 2019). The research by Ishak and Sukirman mostly investigated the higher education students, yet mostly focused on expectation. Even though they used the term perception in their study, they failed to clearly distinguish between perception and reality, which is apparent in their abstract (Ishak & Sukirman, 2019).

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30123

Although there is a considerable amount of research on the perception of vocational education students, far less attention has been given to the motivation of students to choose to pursue a vocational degree. In fact, motivation is one of the most important factors that influence human behavior. It is defined as internal conditions that encourage individuals to achieve certain goals (Nursalam & Efendi, 2008). Basically, the process of motivation is dynamic caused by the fundamental needs that encourage individuals to perform in order to fulfill the needs (Zainun, 2007). In addition, in the social phenomenology of Alfred Schütz, motivation has been categorized into *in order to motive* and *because motives* (Qamariah & Sudrajat, 2013). The former is determined by individual expectations about the future or future orientation, while the latter refers to individual past experiences or past orientation (Qamariah & Sudrajat, 2013). Moreover, Munandar (2001) argues that motivation will lead to satisfaction according to the extent that the determined goals are achieved. In this regard, their motivation to choose vocational education will determine their satisfaction. Hence, this study aims to look at what motivated the student of the two-year diploma program at vocational education in West Aceh enrolled for the program and to what extent they are satisfied with the program to fit in with their initial motives. Factors contributing to their satisfaction will be further elaborated. This topic emerges as an essential topic for the future development of this special education since it studied vocational students who are interested in vocational education and in the midst of experiencing the diploma education.

RESEARCH METHOD

The qualitative research approach was used in the study with a case study design. This study examined current students at AKN Aceh Barat. The current study used focused group discussion (FGD) and semi-structured interviews to gather the data. FGD is an appropriate method to obtain initial brainstorming data and generally catch participants' responses to a series of questions (Krueger & Casey, 2002). It encourages participants to talk more about the topic with the help of another peers' idea. However, due to its communal activities, participants might tend to imitate popular responses closing the possibility of finding novel responses. In order to complement the FGD, most participants underwent semi-structured interviews. The interview provided the participants the ease to express their ideas and delivered private and distinctive answers. Its only drawback is that students might not have any ideas on how to respond to certain questions. Nevertheless, the interview's weakness has been complemented by FGD and vice versa.

A total of 23 students with the average ages of 19 years old participated in this study. Seven participants took part in FGD, while 16 students sat for interviews. All students whose responses are quoted would be assigned dummy names to refer to them in findings. Their assigned dummy names are typical Indonesian names such as Rio, Radi, and Nina.

The data obtained would be analyzed qualitatively following the model by Miles, Huberman, and Saldaña (2014). The analysis process consists of data collection, condensation and presentation. The process is further elaborated by Houghton, Murphy, Shaw, and Casey (2015), involving four stages, including extensive coding, pattern coding, distilling, and making propositions.

RESULTS AND DISCUSSION

Prior to inquiring about the core questions, all participants were asked background questions such as ages, type of school origin, work experience, and financial support in order to establish the demographic data. Each of them is elaborated as follows.

Out of the 23 participants taking part in the study, 18 of them are male while the rest are female. Most participants are aged between 18 and 19 years old, which is the typical age for Indonesian students enrolled for higher education. All participants are drawn from three different programs offered at the diploma in vocational education. Three students studied metal welding, seven studied concrete foundation and road paving, and 13 studied electrical network installation.

About 34% of the students had a background of vocational education as in their high school while the rest went to general high school. A total of 12 students came from general high school, eight students from vocational high schools, and three others originated from Islamic high school.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30123

More than half of the participants reported that they have worked prior to study at AKN Aceh Barat. The financial support for their studies also varied. Most students come from the medium-income families. More than 65% of the students received benefits from the government scholarship, while the rest got support from parents or close relatives. One student reported to be self-funded but was in the process of applying for the government scholarship for the next semester. The background data can be observed in Table 1.

Table 1. Demographic Data

	Demographic	Number
Gender	Male	18
	Female	5
Age	18 – 19	16
	20 – 21	4
	22 – 23	3
Department	Metal Welding	3
	Concrete Foundation and Road Paving	7
	Electrical Network Installation	13
Type of School Origin	General High School	12
	Vocational High School	8
	Islamic High School	3
Work Experience	Working	13
	Not Working	10
Financial Support	Scholarship	15
	Parent	5
	Relative	2
	Self-funded	1

Motivation to Pursue Vocational Degree

Participants conveyed various reasons as to why choosing the two-year diploma program over the undergraduate program. Meanwhile, student's motivation varied a lot, overall, their responses could be classified into three main categories, practical skills, durational advantage, and financial constraints. The discussion of motives is presented in descending order from the most to the least important motives. Each category will be presented with the main overview, followed by selected excerpts from the interview for illustration of what the interviewee expressed. Figure 1 depicts the overall motivation factors based on the demographic characteristics.

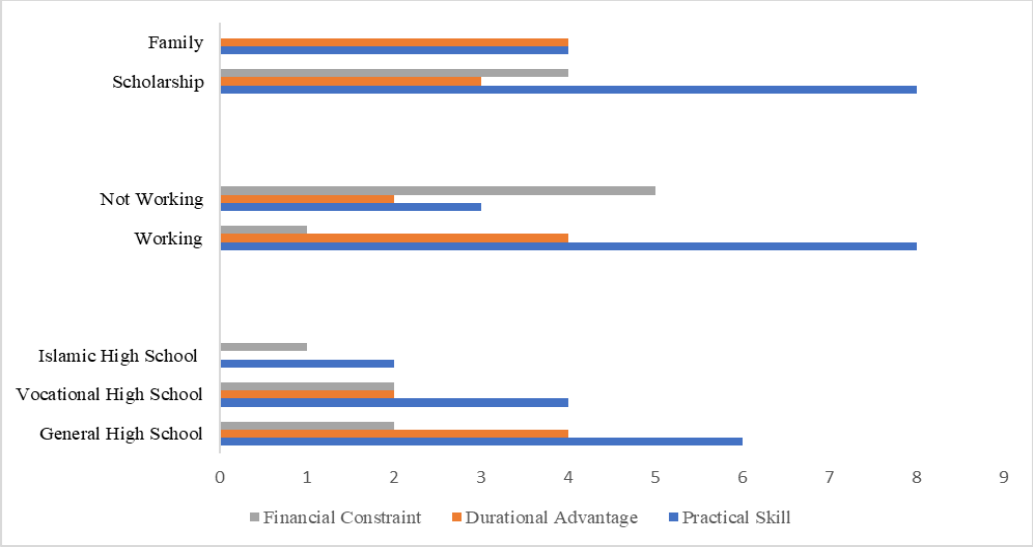


Figure 1. Motivation Factor by Demographic Characteristics

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30123

Practical Skill

Practical skill defined here is the skill learned at an educational institution related to the use of tools in actual work. Almost all students argued that they chose diploma over undergraduate programs due to the practical curriculum offered in the diploma program. They believed that a vocational diploma would allocate most of its study time in a laboratory to equip students with applied skills. The diploma would provide a balance between theory and practice in its curriculum. Even general courses such as English have been tailored to English for vocational education, equipping students with practical English for engineering (Masykar, 2019). Such a need for curriculum integration has been coined by Arellano, Masykar, and Almulhim (2019). Getting their hand dirty with tools is much intriguing for these students compared to hours of lectures given in the undergraduate program. The skill they would get in vocational education could help them work for companies or open their own business in the future.

However, surprisingly few students argued that a vocational diploma will help them get jobs easier. It is in contrast to the data pro-vided by the National Centre for Vocational Education Research (NCVER) of Australia. The study found that getting a job is the main reason for people enrolling vocational education (Karmel & Nguyen, 2006). A similar argument has been coined by Chareonwongsak (2018), citing the study of the Asian Development Bank. The followings are the excerpt from the participants on how the skill to be obtained in the vocational diploma is the major force of their decision to enroll in the program.

"I like working with tools instead of listening to theories. At the diploma, I would immediately be handed tools so that I could start working with them compared to theories", said Adi, who has been working in a paddy plant prior to enrolling at the vocational diploma. Another participant, Saidi, who owns a motorcycle cleaning service and funded his study with his own money, said, *"Many undergraduate students do not have jobs after they finish their study. Here in diploma, I would learn skills and many companies are looking for skills nowadays."*

Another participant, Rio, would go on and argued:

> *"Studying at university offers too many theories. My head could not grasp the theoretical framework. Diploma, on the other hand, offers practical skills. If I have skills, I would be able to make my own money once I graduated. I could work freelance installing electrical network or repair homeware electronics. Installing home electronics would earn me IDR 50K for each intersection installed."*

Rio has worked as a construction and planta-tion laborer during high school to support his family. The 18-year-old received a benefit from the government scholarship for his study. The scholarship cover tuition fee and a less-than-adequate monthly stipend.

Durational Advantage

What we mean by durational advantage is benefit in terms of the length of study time between a two-year diploma over the traditional four-year undergraduate program. The duration of the study students have to spend on a two-year diploma is shorter than that at a university. At the vocational education, the students have choices to study ranging from two, three to four years, while universities require students to study at least four years to graduate. Vocational students see a shorter time at the diploma program as an advantage over an undergraduate program. They do not like to spend much time studying. They want to find work sooner and make money by cutting two years of study. Their responses could be observed in the following excerpts.

Rio, for example, wanted to work immediately after finishing his study. He does not like studying for a long period of time, like at the university. Bono, 21, who is two years older than Rio felt that his current age is the determining factor why he opted for the two-year diploma. He previously had studied at another diploma program in Aceh Barat Daya but failed to graduate because the institution went bankrupt just one semester before he graduated. He said:

> *"I am currently 21 years old. If I take the undergraduate program at a university, I would be 25 by the time I graduate. So, it is better for me to study in a two-year diploma program, which saved me another two years."*

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30123

He worried if he studied at a university, he would be too late to work. To put it in perspective, most Indonesian students graduate from university at the age of 22 years old, and by 25 years old, they should have a job as the source of income.

Financial Constraints

Financial constraint is defined as a monetary limitation faced by the participant to continue their study to higher education. In this study, financial constraints are divided into two types based on the source of tuition funding. Those who enrolled at the vocational program without scholarship considered as the lower tuition fee, which is only at IDR 600.000 as the reason to apply for the diploma. They argued that affordable tuition fee is one of the reasons they opted for vocational education. Students who received scholarships said that the scholarship is the reason for them to study in the diploma program. Some even argued that without the scholarship, they would not continue their study to a higher level of education. They felt better off working or study Islam. Some students come financially unfortunate families and could not afford to pay the tuition fees set by some universities. Associated cost during education is also out of reach for these low-income families. Therefore, it is reasonable for these students to search for a cheaper alternative to higher education offered by this unpopular institution. Their highlighted responses could be observed in the following excerpts from the interviews.

Rudi, an electrical engineer student, said:

> *"At first, my parents wanted me to study Islam in traditional Islamic boarding school. However, since I got a scholarship to study in AKN, my parents allowed me to continue the study. If I do not get the scholarship, my parent suggested me to study Islam at a boarding school."*

Meanwhile, Nino, whose parent paid for his tuition fee, said:

> *"I have known this diploma program for a while, and it offers electrical engineering courses which absent in UTU. At first, I thought the tuition fee was expensive while, in fact, it is cheap. Therefore, I did not apply and became off-study for a year after high school."*

Another interesting response worth mentioned was made by Nina. She said*:*

> *"My parents do not have money to support my study at the undergraduate level. Here, in the diploma, I get Bidikmisi (the government scholarship). I really wanted to study at a university, but my family could not afford it. Thus, instead of unemployed and do nothing at home, I decided to study a diploma instead."*

Nina graduated from vocational high school in Meulaboh, majoring in agribusiness. She wanted to enroll at the University of Teuku Umar because the university offered agribusiness major but had to bury her hope due to financial constraints. The two-year diploma program she is currently in has met her hopes even though she is currently majoring in electrical engineering.

From the aforementioned underlying motives, the practical skills and the duration of study can be categorized into *in order to motives*. The expectation to gain more practical skills to their work in the future and their optimism to obtain their degree in a shorter time than university students are their future-oriented motivation. Moreover, the financial constraint can be classified as *because motive*. The lack of finance experienced by the participants has motivated them to choose to undertake vocational education over university as it offers lower tuition fees.

Satisfaction toward Vocational Degree

To contextualize the findings, it is worth mentioning that our current participants are all in the first semester of their study. The study was conducted at the end of their first semester. Thus, despite the fact that they are relatively new on the campus, they should have enough experience to establish their feeling toward the diploma program. When asked if the study experiences offered by the vocational education have lived up to their expectation before they enrolled, students demonstrated mixed answers. Their satisfactory level could be categorized into three levels, satisfied, unsatisfied, and in-between. The in-between is referred to the students who are satisfied with one

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30123

aspect of the program yet felt the need for improvement in another aspect. Most of the students, 15 out of 23 students, reported that they were satisfied with the diploma program, while those who were not satisfied and in-between were five and three students respectively. The comparison of satisfaction level by demographic characteristics can be observed in Figure 2.

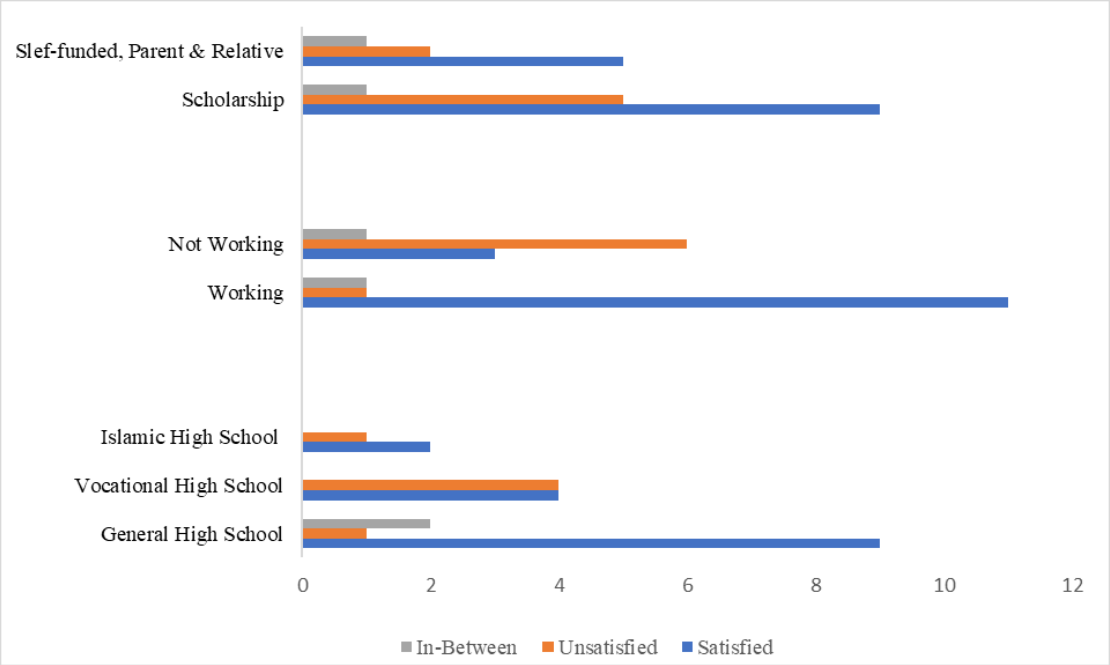


Figure 2. Satisfaction Level by Demographic Characteristics

Interestingly, the students whose high school background was vocational education had divided opinion on the quality provided in the current vocational diploma. Half students said that they were satisfied, while the other half felt that their high school was much better compared to the current diploma. The dissatisfied students coming from vocational high school contributed to 80% of the total number of dissatisfied students. Students with vocational background could compare the quality of the current program with their previous education while the students with general high school background do not have any experience to compare. Thus, they are pleased with the quality of the vocational diploma and only one student said that the education she got was not as expected. However, she did not refer to the educational quality provided but having to do with the mathematical calculation she had to endure in the program. Some of their responses could be observed as follows.

Nino, who is majoring at electrical installation argued that he has experienced changes in knowledge. He said:

> *"At my vocational high school, I only learned components, such as diode while here I learn it in more detail such as how the diode works. I am happy here because I get friends and knowledge. The facility is adequate, and, in fact, it is much more complete compared to the one I had in my previous vocational high school. In high school, we still used the broken tools, while here broken tools are not used.*

Radi, on the other hand, made a strong dissatisfied argument and said, *"My previous high school was much better. There, after theory, we immediately were given chances to apply it in practices. I felt this diploma taught me more theories. It is not what I expected. I learn drawings but discouraged."* Radi is majoring in concrete and road paving engineering and the program offered different curriculum models than the other programs. While other programs integrated lad activities every week, the concrete and road paving diploma schedule laboratory work after three months of theoretical study. Thus, Radi could not observe immediate practice in his current diploma.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30123

Factors Contributing to Students' Satisfaction

The student's responses to satisfactory questions can be classified into five categories, practical skills, theoretical content, laboratory facilities, campus infrastructure, and student numbers. The distribution of factors by school origin can be observed in Figure 3.

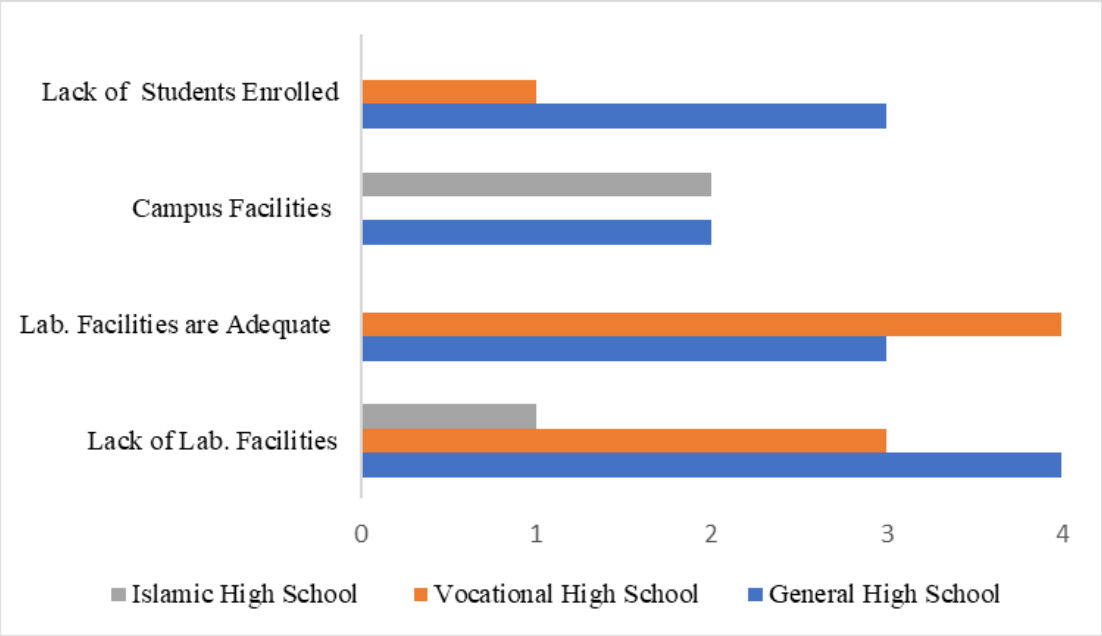


Figure 3. Factors Contributing to Motivation by School Origin

Practical Skills

Many students reported that they have learned some basic practical skills and are optimistic they will learn more in the next semester. However, some students felt that the diploma program does not give them enough practical skills compared to what they experienced in vocational high schools.

These students were mostly of vocational school origin. Students with non-vocational backgrounds felt that what they learn in the early semester is adequate and has met their expectations. They look forward to learning more skills in the next semester after observing what the seniors learn in the semesters to come. One student argued that the current diploma is lack of fieldwork. He felt that a field trip is important to give them real-life examples of how practical skills used at work. He came to this idea because he had studied in the diploma before. However, he did not finish the program since the institution went bankrupt.

Theoretical Content

In terms of theoretical content, students felt that the theory offered in the class had matched the practices they learned in the laboratory. This finding is in line with what is suggested by the Asian Development Bank research on the need for theoretical and practical complement in higher education institutions (Chareonwongsak, 2018). The knowledge they get is also much more in-depth and detailed than what they learned in high school. They said that the content in the diploma is more focused compared to their vocational high schools. Students with general high school backgrounds also felt that they have learned many new things during their diploma degree. On the other hand, some students felt that the theoretical content is too much compared to vocational high schools. One student even claimed that the theoretical content outnumbered its practical content. Even though they felt so, they believed that it is acceptable in the first semester. Based on what they saw in senior classes, they are confident that in the next semester, they will learn more practical skills.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30123

Laboratory Facilities

Many students felt that laboratory facilities are inadequate. These are apparent from their argument that they have to share tools with friends when doing practical work in the laboratory. Sometimes they must wait for their friends to finish working with the tools. Even though some students felt that the lack of working tools hampered their chance to learn practical skills, others felt that working with friends is much better than working on tools alone. Lack of facilities has also been reported in the previous study on vocational high school by Hermanto et al. (2019). Further, Setiawati and Sudira (2015) argued the significance of facilities to motivate students in learning.

When working in a group on one tool, they can learn from their friends and help each other out. Those who felt each student should be given one tool believed that they could fully master the tools by having more time playing with it without having to wait. Interestingly, there is one student who said that the number of study time allocated to laboratory practice is overwhelming. They felt it inconvenient to be on campus from the morning to noon every weekday. His argument is discernable when we look at the number of times allocated by non-vocational higher education. In fact, this condition is what sets vocational education apart from other conventional education.

Campus Infrastructure

In addition to a lack of faculty laboratory, the students also felt that the in-class facility needs improvement. They complained about the broken classroom fans, unorganized, and dirty laboratories. One student also complained about the road to campus being muddy during rainy seasons and may cause an accident if left neglected.

Number of Students

Surprisingly to our initial belief, students felt that the lack of students is crucial for students during the study. They felt lonely and unmotivated because there are not many students who are studying at the vocational diploma. It basically contradicts the underlying presumptions that it is a privilege for the students to study in a small class. It is generally assumed that by studying in a small class, students would get more privatized knowledge, like the European education system (Chingos & Whitehurst, 2011). In fact, they felt that the number of students in the classroom could motivate them to study and they can make a lot of friends. To put their answer in perspective, the average students in a class of each diploma program is 17 students.

According to the findings, it is apparent that the participants' satisfaction towards the vocational degree is highly determined by the motives to gain practical skills over merely theoretical knowledge. Another factor, such as laboratory facilities, is highly associated with practical skills. Their disappointment over the lack of tools in the laboratory is stemmed from their initial expectation to gain more practical skills at the vocational degree. These findings support the idea of Munandar (2001) that the extent to which the fulfillment of individual needs (motivation) is achieved can define the level of satisfaction.

CONCLUSION

This study found that students enrolling at the two-year diploma at the AKN Aceh Barat have distinctive motives and their motives have mainly been fulfilled at various degrees by the academy program. Factors contributing to a satisfactory level include practical skills, theoretical content, laboratory facilities, building infrastructure, and the number of students.

The diploma students are fully aware of the practical skills offered in the curriculum of the community college before enrolling. They believe that practical skills are very much needed in their future work, either by working for others or opening their own businesses. They saw the short duration of study in the diploma program as an advantage over the non-diploma program. Cutting two years of study of the conventional four years courses would give them the opportunity to experience work sooner and make their own money. Financial constraints of their family income may have prevented them from studying at higher education. Still, the community college, with its low tuition fee and full scholarship offers, has given them chances to change the course of their future

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30123

fate. All of these have been in line with what the government initially intended by awarding state status to the academy.

Even though many students have been satisfied with the diploma program, some have felt that their motives have not been fulfilled. This finding needs to be seriously taken into account, considering those who had such opinions predominantly coming from vocational high schools. Even though some students admitted that the community college has managed to balance the practical skills and theoretical knowledge, some others still argued for the lack of practical skills taught. While the lack of laboratory facilities is reasonable as the reason for some students to be unsatisfied with the diploma, the low number of students enrolled at the college is an interesting factor for the students to feel discouraged during their study. Future studies should pay attention to the satisfaction of diploma students and their employability after graduates. The perception of the adjacent community toward a diploma should be researched as well to see how well non-diploma students perceive diploma programs. For the government to thrive in producing industrial workers, the policy and support in favor of the two-year diploma program should be prioritized. The designation of the special general directorate for vocational education under the ministry of education is a sign that the Indonesian government is serious about developing vocational education.

REFERENCES

AKN Aceh Barat. (2019). *Akademi Komunitas Negeri Aceh Barat*. https://aknacehbarat.ac.id

Arellano, R., Masykar, T., & Almulhim, A. (2019). The rationale for a proposal for English language education: The experience of developing a curriculum to teach English for young learners. *Proceedings of the 1st Aceh Global Conference (AGC 2018)*, 179–185. https://doi.org/10.2991/agc-18.2019.27

Chareonwongsak, K. (2018). *Balancing theory with practice*. University World News: The Global Window on Higher Education. https://www.universityworldnews.com/post.php?story=20180523132915572

Chingos, M. M., & Whitehurst, G. J. "Russ." (2011). *Class size: What research says and what it means for state policy*. Brookings. https://www.brookings.edu/research/class-size-what-research-says-and-what-it-means-for-state-policy/

Fatahillah, A., & Triyono, M. B. (2019). Graduates' perception on the importance of special job market in state vocational high schools in Langsa City. *Jurnal Pendidikan Vokasi*, *9*(2), 197–206. https://doi.org/10.21831/jpv.v9i2.26361

Hermanto, F. Y., Sutirman, S., Hidayati, B., & Sholikah, M. (2019). The need of practical teaching in vocational high school of Automation and Office Management Program. *Jurnal Pendidikan Vokasi*, *9*(3), 238–248. https://doi.org/10.21831/jpv.v9i3.26734

Houghton, C., Murphy, K., Shaw, D., & Casey, D. (2015). Qualitative case study data analysis: An example from practice. *Nurse Researcher*, *22*(5), 8–12. https://doi.org/10.7748/nr.22.5.8.e1307

Ishak, A. A. A., & Sukirman, A. S. (2019). Ekspektasi dan persepsi mahasiswa akuntansi terhadap kualitas pendidikan yang ditawarkan Politeknik Negeri Ujung Pandang melalui jalur mandiri. *Journal of Applied Managerial Accounting*, *3*(1), 9–15.

Karmel, T., & Nguyen, N. (2006). *The value of completing a vocational education and training qualification*. National Centre for Vocational Education Research.

Krueger, R. A., & Casey, M. A. (2002). *Designing and conducting focus group interviews*. https://www.eiu.edu/ihec/Krueger-FocusGroupInterviews.pdf

Law of Republic of Indonesia No. 12 of 2012 on Higher Education, (2012).

Majid, A. (2012). Faktor-faktor yang berpengaruh terhadap minat siswa SMP masuk SMK. *Jurnal Pendidikan Vokasi*, *2*(3), 285–292. https://doi.org/10.21831/jpv.v2i3.1037

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

Masykar, T. (2019). Analisa kebutuhan English for specific purpose untuk pendidikan vokasi. *VOCATECH: Vocational Education and Technology Journal*, *1*(1), 47–50. https://doi.org/10.38038/vocatech.v1i0.9

Miles, M. B., Huberman, A. M., & Saldaña, J. (2014). *Qualitative data analysis: A methods sourcebook* (3rd ed.). Sage.

Munandar, A. S. (2001). *Psikologi industri dan organisasi*. UI Press.

Nursalam, N., & Efendi, F. (2008). *Pendidikan dalam keperawatan*. Salemba Medika.

Qamariah, R., & Sudrajat, A. (2013). Motif keluarga dalam pemenuhan kebutuhan psikososial lansia. *Jurnal Paradigma*, *1*(3), 1–7. https://jurnalmahasiswa.unesa.ac.id/index.php/paradigma/article/view/4043/6558

Saputri, N. L. E., Artana, M., & Haris, I. A. (2013). Persepsi siswa SMP kelas IX tentang sekolah menengah kejuruan (Studi kasus pada siswa kelas IX SMPN1 Sukawati dan SMPN1 Blahbatuh). *Jurnal Pendidikan Ekonomi Undiksha*, *3*(1). https://doi.org/10.23887/jjpe.v3i1.1240

Setiawati, L., & Sudira, P. (2015). Faktor-faktor yang mempengaruhi prestasi belajar praktik kejuruan siswa SMK program studi Keahlian Teknik Komputer dan Informatika. *Jurnal Pendidikan Vokasi*, *5*(3), 325–339. https://doi.org/10.21831/jpv.v5i3.6487

Spees, A.-C. (2018). *Could Germany's vocational education and training system be a model for the U.S.?* World Education News + Reviews. https://wenr.wes.org/2018/06/could-germanys-vocational-education-and-training-system-be-a-model-for-the-u-s

Sriwardani, N. (2011). Persepsi mahasiswa terhadap perkembangan pendidikan vokasi di program pendidikan teknik mesin. *Jurnal Pendidikan Vokasi*, *1*(1), 179–190. https://doi.org/10.21831/jpv.v1i1.5813

STAIN Dirundeng. (2019). *Sekolah Tinggi Agama Islam Negeri Teungku Dirundeng Meulaboh*. https://staindirundeng.ac.id/

Sunarko, S. (2009). Persepsi siswa tentang pencitraan Sekolah Menengah Kejuruan (SMK) di Kabupaten Trenggalek. *Teknologi Dan Kejuruan: Jurnal Teknologi, Kejuruan Dan Pengajarannya*, *32*(2), 177–186. https://doi.org/10.17977/tk.v32i2.3099

Universitas Teuku Umar. (2019). *Universitas Teuku Umar*. http://www.utu.ac.id/

Utami, L. D. (2019, December). Ainun Naim bicara soal program studi vokasi usai dilantik Nadiem Makarim jadi Sekjen Kemendikbud. *Tribunnews.Com*. https://www.tribunnews.com/nasional/2019/12/16/ainun-naim-bicara-soal-program-studi-vokasi-usai-dilantik-nadiem-makarim-jadi-sekjen-kemendikbud

Wulandari, S. I., Putro, S. C., & Rahmawati, Y. (2015). Pengaruh persepsi orang tua dan siswa terhadap minat masuk SMK. *TEKNO*, *23*(1), 60–70. http://journal.um.ac.id/index.php/tekno/article/view/5159/3915

Zainun, B. (2007). *Manajemen dan motivasi*. Balai Aksara.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

Jurnal Pendidikan Vokasi
Volume 10, No. 1, 2020 (22-33)
Online: http://journal.uny.ac.id/index.php/jpv

PROJECT-BASED LEARNING TOOLS FOR LIGHT VEHICLE ENGINE MAINTENANCE SUBJECTS AT VOCATIONAL HIGH SCHOOL

Muslim[1]*, Ambiyar[1], Dedi Setiawan[1], Rido Putra[1]
[1]Universitas Negeri Padang
Jl. Prof. Dr. Hamka, Kampus UNP Air Tawar, Padang 25132, Indonesia

Abstract

This study aims to develop learning tools for project-based light vehicle engine maintenance and describe the teacher's response to the application of project-based learning tools in light vehicle engine maintenance subjects. This research is a research and development (R&D) model with ADDIE. The ADDIE development model consists of analysis, design, development, implementation, and evaluation. The results showed that the product developed was valid in terms of validity, very practical in terms of practicality, and very high in the aspect of effectiveness. Based on the aspects of validity, it can be specified that the syllabus gets a percentage score of 90.25%, 88.78% learning implementation plan, 86.56% module, 88.93% job sheet, 87.5% achievement test instrument, and project test instrument 87.08%. Based on aspects of practicality assessed from the teacher's response, it can be specified that the syllabus gets a percentage score of 88.67%, 86.88% learning implementation plan, 88.75% module, 88.77% job sheet, 85.42% test instrument for learning outcomes, and 83.33% project test instruments. Overall, teachers find it helpful to develop project-based learning tools. Based on the effectiveness, the results of students' knowledge tests with the percentage of mastery learning in the knowledge area amounted to 86.67%, and the skill area amounted to 86.67% with very high criteria. Researchers can conclude that project-based learning tools on light vehicle maintenance subjects are in accordance with valid, practical, and effective criteria.

Keywords*: learning tools, project-based learning, ADDIE model, validity, teacher response*

How to cite: Muslim, M., Ambiyar, A., Setiawan, D., & Putra, R. (2020). Developing project-based learning tools for light vehicle engine maintenance subjects at vocational high school. *Jurnal Pendidikan Vokasi, 10*(1), 22-33. doi:https://doi.org/10.21831/jpv.v10i1.29564

***Corresponding Author:** Muslim muslim@ft.unp.ac.id
Department of Automotive Engineering, Faculty of Engineering, Universitas Negeri Padang
Jl. Prof. Dr. Hamka, Kampus UNP Air Tawar, Padang 25132, Indonesia

https://doi.org/10.21831/jpv.v10i1.29564

INTRODUCTION

The learning tools is a material that should be prepared by a teacher before implementing learning and one of the main things that must be available because it is one indicator of the success of the learning process so that teachers are more focused on providing material to students (Mauliana et al., 2018). Designing learning tools is important for a teacher because learning tools can be guidelines, benchmarks, increased professionalism, and teachers' ability to help facilitate learning. Learning tools can facilitate teachers and students in the learning process (Purnamasari & Wangid, 2016). However, in reality, there are still a few teachers who can develop learning tools. The teacher only uses the existing learning tools without making them independently, so the learning process is still textual. The teacher only explains the material that is already in the textbook, and the students only listen and record the teacher's explanation, which results in more classroom activity dominated by the teacher.

Development of learning tools whose ultimate goal is to emphasize mastery of concepts and mastery of students' skills because learning tools are tools used to assist in learning both in the classroom and in the laboratory where they conduct practical work (Prasetyo, 2011). Learning tools that emphasize thinking skills must be developed and according to the context of student learning environments so that students have much better competence than before (Fatkhurrokhman et al., 2017). This learning tool is expected to be contextual, not only covering the cognitive domain but also psychomotor and affective and in accordance with the conditions of students who are undergoing the learning process.

The results of researchers' observations and interviews with several automotive productive teachers at SMKN 1 Lahat, especially in light vehicle engine maintenance subjects, showed that the lessons learned at school were less varied. Almost all learning materials for light vehicle engine maintenance are delivered using the lecture method. The teacher often gives lectures, and students listen to what is conveyed by the teacher. This makes not all students listen carefully; some are busy themselves, some are bored, less motivated, and do not listen to the teacher's explanation.

To develop learning tools for the maintenance of light vehicle engines in accordance with the 2013 curriculum, alternative actions that can be offered as expected are project-based learning. This project-based learning usually uses problems as the beginning of learning to be able to gather knowledge and materials because students are the focal point in the learning process (Mozas & Barba-Colmenero, 2013). In other words, the development of project-based learning tools is a planned and ongoing effort for learning to maintain light engine vehicles that will be applied to light vehicle engineering students at SMKN 1 Lahat.

Project-based learning is designed to investigate students and understand when dealing with complex problems (Sailin & Mahmor, 2018). So that learning objectives can be achieved well, where students become active learners, students can manage their own project completion activities or learning tasks so that the learning process can be more independent and can also provide in-depth knowledge to students (Baghoussi & El Ouchdi, 2019). The benefits of project-based learning, among others, are to gain new knowledge and skills for students during the learning process (Aydın et al., 2018). On the other hand, the emergence of ability and activeness in problem-solving and increasing understanding skills in managing information both independently and in groups are also the benefits of this problem-based learning. The emergence of student learning activities is also the result of teacher learning in providing learning so that students can think more actively in learning (Muslim et al., 2019). The characteristics of successful teachers are being able to provide learning that makes students compelled to solve problems (Arends, 2001). This is suitable for the subject of light vehicle engine maintenance. Based on the problems that have been explained, the researchers conducted research using the theme of developing project-based learning devices with the subject being the subject of light vehicle engine maintenance at SMKN 1 Lahat.

The tool used in the learning process is called learning tools (Prasetyo, 2011). Learning tools are a collection of learning resources that allow teachers and students to carry out learning activities. The success of a teacher in learning is desirable; to meet these objectives requires good preparation. Learning tools are also a number of materials or guidelines used in student learning processes (Suhadi, 2007). Learning tools must also be monitored so that the implementation of learning

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29564

is more directed towards achieving the expected competence (Rusman, 2012). One of the learning tools that will be developed is the syllabus. This syllabus plays an important role in the application of other devices.

The term syllabus can be defined as "outline, summary, or subject matter". The syllabus refers to curriculum development products in the form of further elaboration of the standard competencies and basic abilities to be achieved by students, which result from the actions of a teacher in class, which are usually made in written form (Sabbah, 2018). The syllabus is also part of the curriculum, which contains a description of what the teacher will teach in class, about the goals to be achieved later on, and what skills students will get as recipients of learning (Hoesny, 2013). The syllabus is also used as a set of plans and arrangements regarding learning activities, classroom management, and learning outcomes assessment. This is made so that teachers can understand in whole or all components related to basic competencies in the learning process (Yulaelawati, 2004). With this syllabus, other instruments can be made by referring to and considering educational institutions in the learning process that need other important aspects, such as making learning plans, modules, job sheets, and so on.

The Learning Implementation Plan is a plan to describe the procedures and organize learning to achieve the basic competencies set out in the Content Standards and explained in the syllabus (Kunandar, 2013). The development of a learning implementation plan must consider several important aspects, for example, it must be based on the condition of the students to be taught. Then, in preparing the learning implementation plan, the syntax must adjust to the curriculum that applies to an educational institution. In preparing and developing a learning implementation plan, it is usually not separated from the scope of the subject matter that already exists in the syllabus. With this learning implementation plan, new teachers can adjust the modules' use or the modules that will be developed for the topic can be applied to students in the learning process.

Modules are usually one of the teacher's facilities to students in the learning process (Hamid et al., 2017). The module is one of the learning media that can be used to support teaching and learning activities, usually in the form of printed media (Serevina et al., 2018). The material or contents of the written module must be in accordance with the lesson plan. The module content includes the substance students need to master a competency by utilizing more efficient learning time (Martiningsih & Susilowati, 2019). Modules must describe the basic competencies that students want to achieve, are presented using good language, are interesting, and are equipped with illustrations (Abdul, 2009). It is highly recommended that one competency be developed into one module, but considering the specific characteristics, breadth, and complexity of the competency, one competency may be developed into more than one module.

Job sheets are practical learning guides that have work drawings as material to practice and are accompanied by operational work steps and are equipped with evaluation sheets for student practice independently (Nurhasanah et al., 2017). The job sheet has the final goal of training students' abilities in practicum learning (Soivan & Rijanto, 2018). Job sheets that are used by teachers to students in practical matters have a scope of material that must be in accordance with the syllabus used in institutional units (Jumargo et al., 2011). On the other hand, the job sheet is also a sheet containing the teacher's tasks when doing practical activities to students, and students must follow the work that is on the job sheet (Abdillah, 2013). Job sheet is used when doing practical work aimed at facilitating student work in accordance with instructions specified by the practical teacher, so students can focus more on learning (Widyastuti & Utami, 2018). The benefits gained when using a job sheet during practical work are to better understand and do their job correctly according to the instructions contained in the job sheet. In addition to the developed worksheet, there are other things that must be considered, namely the assessment instruments. The teacher uses the instrument in assessment to collect information about students and improve the quality of learning because between the assessment and learning outcomes are interrelated with each other (Shofwanthoni et al., 2019).

Assessment instruments must be used and developed to gather student information and facilitate teachers in measuring or developing student character (Handoyo & Listyarini, 2018), because the assessment instrument is one form of assessment consistent with the K-13 curriculum (Anjaya et al., 2019). Therefore, the assessment instruments developed in this study include knowl-

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29564

edge and skills competency assessment instruments. Assessment is a bridge between the teacher and students in the learning process, so the assessment of knowledge and skills needs to be there (Wiliam, 2013). Knowledge competency assessment focuses on intellectual knowledge and abilities (Wahyuni et al., 2018). Knowledge competency assessment in this study uses written tests in the form of multiple choice. The competency assessment skills to be developed are project assessments. The instrument used refers to the achievement of learning outcomes indicators according to the scope of the curriculum that students can do. Project review aspects that need to be considered include management skills, relevance, and authenticity. Management ability is students' ability to choose topics, search for information, and manage project implementation time.

Project-based learning is the application of active learning methods carried out in student-centered classrooms (Zancul et al., 2017). This learning will positively influence the wearer to improve student collaboration skills (Shin, 2018). In simple terms, project-based learning is defined as teaching that tries to connect technology, sources of information, and daily life problems that focus on student learning (Gerhana et al., 2017). The application of this learning will increase high-level thinking to solve the problems that have been given (Chiang & Lee, 2016). During presentations, students show what they are learning as they travel through class units, interact with related subjects, collaborate with each other and with their teachers, and assess themselves and each other that usually produces a tangible product (Ismuwardani et al., 2019). The final outcome of this project-based learning is in the form of project assignments with qualities that can later be accounted for (Harmer & Stokes, 2014).

Project-based learning also uses projects /activities as the core of learning during the learning process (Syarif, 2016). This allows students to be more actively involved in learning (Damayanti et al., 2014). The application of this learning in the form of project assignments to improve student understanding of learning (Winatha & Abubakar, 2018). Students will get the opportunity to overcome challenges and can help directly with discussion groups or communities in real life (Kricsfalusy et al., 2018). The teacher is only a facilitator, evaluating the products of student work displayed in the results of projects that have been carried out, so as to produce tangible products that can encourage student creativity to be able to think critically to analyze the material in the concept of the problem (Habók & Nagy, 2016). It can be concluded that project-based learning is a learning model that is oriented to develop students' knowledge and learning skills through a series of planning activities, the learning process, and producing certain products framed in one single container project-based.

Teachers must pay attention to the most important things when using this learning model, one of which is that teachers should consider important components such as facilitators in the learning process (Trianto, 2014). These components include several things: (1) curriculum content, (2) the multimedia component, (3) the student manual component, (4) cooperation, (5) the component of the relationship with the real world, (6) time frame, and (7) assessment. The assessment process is carried out continuously in each lesson, such as assessing teachers, friends, and reflecting on oneself. To better understand project-based learning, it can be seen in Figure 1.

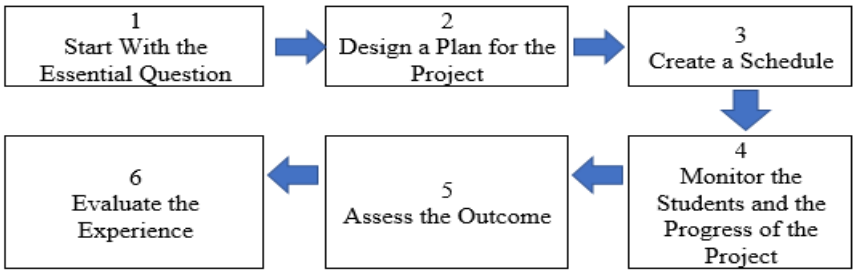


Figure 1. Project Based Learning Diagram (Syarif, 2016)

The project-based learning model always starts by discovering the basic questions, which will later be the basis for assigning project assignments to students (Wekesa & Ongunya, 2016). The topic used must also be related to the real world. Furthermore, with the teacher's help, the

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29564

student group will design activities to be carried out on each project (Febriana, 2017). The greater the involvement and ideas of students (groups of students) used in the project, the greater their sense of ownership of the project (Sari & Mukhadis, 2017). Next, the teacher and students determine the time limit provided in completing the tasks (activities) of their project (Jaime et al., 2016). In the world of education, especially in SMKN 1 Lahat, subjects for maintenance of light vehicle engines must be taken by light vehicle engineering students. Maintenance of a light vehicle engine is one of the theoretical subjects that is then equipped with practical activities. Practicum materials have basic competencies, namely: maintenance of cooling systems, lubrication systems, ignition systems, and fuel systems. The material to be taken for testing and research is the ignition system material, namely the introduction of components and maintenance of the ignition system on a regular basis (periodic service).

RESEARCH METHOD

This research is a research and development that has the objective to obtain/find a particular product. Research and development (R&D) is used to develop and validate products. The product results will be tested for practicality and effectiveness of the product so that it is suitable for use in the world of education. Researchers design learning tools that are developed by formulating learning objectives either developed in general or specifically. Then, the development of test items is used to measure the level of progress and achievement of students and pay attention to the principles of message design to attract readers' attention, especially students.

The model used is ADDIE (Dick et al., 2015). The ADDIE development model consists of (1) analysis in the sense of determining a problem and a solution for student competence in school, (2) design, which aims to determine the strategy and form of the device being developed, (3) development, which means developing the instrument under study, (4) implementation, which aims to apply the design of learning tools, and (5) evaluation, which aims to evaluate the learning tools developed (Sari, 2017). Figure 2 is shown to make the ADDIE model applied in this study clearer.

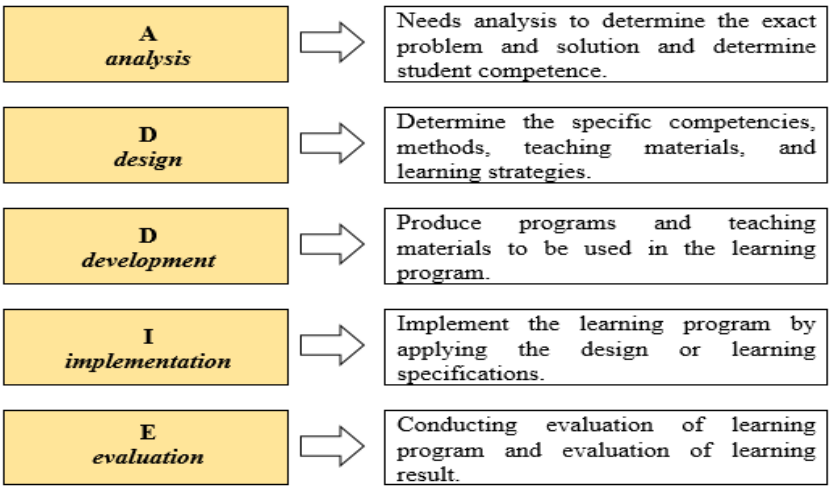


Figure 2. ADDIE Model Diagram (Sari, 2017)

The instrument used for validity is the Rating questionnaire—value analysis techniques using the Likert scale (Sugiyono, 2017). Product trial activities carried out after the learning device produced is said to be valid. Validators involved in the validation phase are two lecturers majoring in automotive engineering and three teachers in light vehicle engineering studies. The total validator is five people. Two expert lecturers and three teachers assessed the evaluation of syllabus validity, teacher response questionnaire, knowledge test instrument, and project test instrument. The evaluation of the lesson plan's validity, module, and job sheet is divided into two aspects, respectively. One lecturer and two teachers assessed the material aspect, while one lecturer and one teacher assessed the media aspect.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29564

A valid learning tool was tested on a limited trial at SMK 1 Lahat. A limited trial was conducted on 30 students. This activity is carried out to measure the practicality of the device being developed.

Practicality analysis is assessed based on the teacher's response to the device that has been developed. The analysis technique uses a Likert scale (Sugiyono, 2017). Learning devices are said to be practical if they can be used in the learning process of maintaining light vehicles in SMKN 1 Lahat.

The questionnaire in this study was generally used to assess learning devices that had been developed, which consisted of questionnaires on the validity of the syllabus, the validity of the learning plan, module validity, the validity of worksheets, and the validity of student learning outcomes tests. Simultaneously, the teacher's response questionnaire aims to determine the teacher's response to the learning device that was developed to obtain a level of practicality. To determine whether the student has been able to master the material carried out a test of learning outcomes for cognitive understanding and project tests for understanding skills in practice.

Analysis of effectiveness using the design of a one-shot case study (Sugiyono, 2017). The results of the study using a quantitative approach from the application of the developed device. Researchers treat without first testing. Researchers conducted a posttest with three limited trials (Sugiyono, 2017). Analysis of effectiveness is assessed from student learning outcomes tests. The learning outcomes test aims to obtain data about the mastery of the material provided after students take part in learning by using project-based learning tools carried out at the end of the experiment. The project test aims to obtain data about mastery of the material in the area of skills provided after students take part in learning by using project-based learning tools carried out at the end of the experiment.

RESULTS AND DISCUSSION

Mastery learning was evaluated using the one-shot case study method by conducting a post-test three times after being treated. The reference used to determine student learning completeness is to compare students' post-test average scores with the achievement of predetermined minimum completeness criteria. To be clearer about the post test scores results using the one-shot case study, see Table 1 and Figure 3.

Table 1. Average Post Test Score Using One-Shot Case Study

Activities	n	Average	Standard Deviation
Post Test 1		74.56	6.34
Post Test 2	30	78.22	6.17
Post Test 3		82.56	9.70

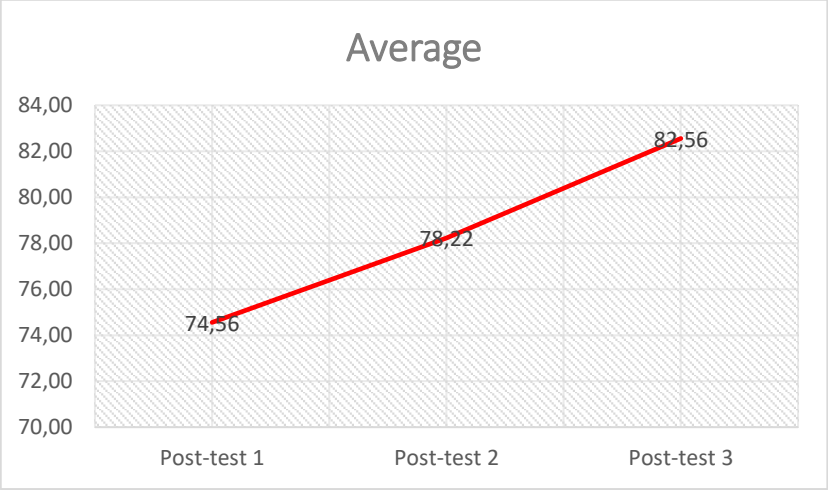


Figure 3. Results of One-Shot Case Study Diagram

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29564

Based on Table 1 and Figure 3, it can be seen and understood that the average value of the post-test increased from post-test 1 to post-test 3. To see the average post-test value in limited testing and the final results of the score student learning outcomes, see Table 2 and Table 3.

Table 2. Average Post-Test on Limited Testing

Activities	n	Average	SD	The value of t arithmetic	t-table
Post-test 1	30	74.56	6.34	2.387	2.048
Post-test 2	30	78.22	6.17		
Post-test 2	30	78.22	6.17	3.396	2.048
Post-test 3	30	82.56	9.70		
Post-test 1	30	74.56	6.34	4.478	2.048
Post-test 3	30	82.56	9.70		

Table 3. Result of Student Tests Study Value Analysis

	n	Min value	Max value	Average	SD
Student Knowledge Test	30	56.67	93.33	82.56	9.70

It can be concluded that the percentage of completeness of learning outcomes of light vehicle engineering in SMKN 1 Lahat in limited testing was 86.67% with very high criteria. From the results of the analysis of the student project test results, it is known that the average value of the project is 80.50, with a percentage of limited testing of 86.67% in very high criteria. In order to know the analysis of student project test scores clearly, Table 4 is presented.

Table 4. Results of Test Analysis Project Value

	n	Min Value	Max Value	Average	SD
Student Project Test	30	70.28	85.74	80.50	4.47

From the learning tools with the ADDIE model at the analysis stage, it can be concluded that it is necessary to develop learning tools with a project-based learning approach. The design stage includes designing syllabi, lesson plans, modules, job sheets, light engine maintenance learning modules for class XI, and also compiling assessment instruments. At the development stage, the design of the learning tools was developed. The validation was conducted by one material expert and one media expert lecturer, namely three light vehicle engineering teachers, so the total number of validator was five people, which consist of two expert lecturers and three light vehicle engineering teachers. The implementation phase is a stage where the learning tools/device is implemented and tested in the field.

The last stage is the evaluation. Evaluation was done by analyzing the data from the assessment of learning tools by expert lecturers and light vehicle engineering teachers. During the trial process, suggestions and input from teachers and students are accommodated to be used as improvements or revisions to researchers' learning tools.

The validity aspect seen from the syllabus assessment results is said to be feasible based on the validity aspect with valid criteria, and the average percentage of validator scores is 90.25%. The evaluation aspect of the learning implementation plan is said to be feasible based on the validity aspect with valid criteria, and the average percentage of validator scores is 88.78%. The learning module assessment aspect is said to be feasible based on the validity aspect with valid criteria, and the average percentage of validator scores is 86.56%. The worksheet's assessment aspects are said to be feasible based on the aspects of validity with valid criteria, and the average percentage of validator scores is 88.93%. The student learning achievement test instrument's assessment aspects are said to be feasible based on the validity aspect with valid criteria, and the average percentage score of the validator is 87.5%. The assessment aspects of student project test instruments are feasible based on the aspects of validity with valid criteria. The average percentage score of the validator is 87.08%.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29564

Syllabus assessment using the teacher response questionnaire received an average percentage score of 88.67% with very practical criteria. The assessment using the teacher's questionnaire responses got an average percentage score of 86.88%. The learning module assessment using the teacher's response questionnaire received an average percentage score of 88.75% with very practical criteria. The worksheet's assessment using the teacher's response questionnaire received an average percentage score of 88.77% with very practical criteria. Assessment of test results based on teacher response scores received an average percentage score of 85.42% with practical criteria. The assessment of project test instruments based on teacher responses obtained an average percentage score of 83.33 with practical criteria.

Knowledge test results on 30 students and the project test scored a good average, but there are still four students who are under due diligence. However, the percentage of mastery learning classical in the class XI light vehicle engineering knowledge class at SMKN 1 Lahat is 86.67%, and the skill field or project of the light vehicle engineering XI class is 86.67%, it can be concluded that the learning tools are used effectively.

Of the three aspects of the assessment of learning tools above are aspects of validity, aspects of practicality, and effectiveness, all three are above the minimum assessment. Based on these results, the researchers concluded that the learning tools based on the project-based learning developed had met valid, practical, and effective criteria.

Using a project-based learning approach, the learning process in the classroom environment will increase in a better direction. This is in line with the statement of Arantes do Amaral and Lino dos Santos (2018) that the project approach enhances learning. Working together in a group environment is a pleasant experience in project learning (Arantes do Amaral & Lino dos Santos, 2018). Students will both learn to solve problems in a different perspective. Findings like this are also similar to Arantes do Amaral et al. (2015), who report that project-based learning has a contribution in increasing students' knowledge and competencies. Students will be motivated, which is the positive impact of project-based learning (Arantes do Amaral et al., 2015).

Another finding is that project-based learning will help teachers in the learning process so that the focus of learning can be shifted to students, in line with the theory proposed by Baghoussi (2019) that using project-based learning will shift learning theories initially focused on the teacher to be student-centered. The module can be used well if it has passed the stages of validity, practicality, and effectiveness of use (Apriliana & Warju, 2013). This is in line with the findings of a research that the learning tools developed are in accordance with aspects of validity, practicality, and effectiveness. The high response questionnaire for module practicality has proven that the module is suitable for use (Faridah & Warju, 2014). The use of job sheets when practicum activities will improve student learning outcomes. This is in line with Abdillah (2013) thought that the job sheet has an important role in improving student learning outcomes in practicum activities. Project-based learning by developing job sheets allows students to learn independently in practical activities (Widyastuti & Utami, 2018). Learning outcomes obtained are already at very high criteria with the application of this learning. Student learning outcomes will improve with the application of project-based learning models, both cognitive, affective, and psychomotor aspects of students (Febriana, 2017). This learning activity will make students able to work independently and in groups or teams (Zancul et al., 2017). Learning activities in vocational schools will produce learning in accordance with the vocational received; successful students will bring the same skills as those obtained in a vocational environment (Prosser & Quigley, 1950). The knowledge gained will be given proportionally because what is obtained is a real learning activity by producing a real product.

CONCLUSION

A project-based learning tool has been produced on the subject of light vehicle engine maintenance using the ADDIE development model. Learning tools that have been developed consist of the syllabus, lesson plans, modules, job sheets, test instruments for cognitive assessment results, and skills assessment instruments developed in accordance with valid criteria, practical and effective criteria. The test of learning outcomes and project tests on the criteria is very high based on the classical completeness aspects, with a percentage of completeness of 86.67% for each test.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29564

Learning tools developed will be very good to be applied when the learning process takes place. Learning tools that have been developed will bring students interested and make students understand the material because it is packaged according to student characteristics. The existence of a project approach will make students accustomed to solving problems, making time allocation of learning, solving solutions, and producing products. Project-based learning can be applied to vocational high schools in general. This can be done because essentially, teachers can develop project-based learning not focused on one agency or one school alone, which can involve vocational schools or other high schools.

Similar research activities develop project-based learning and develop learning tools in vocational schools and other public schools. Improvement of learning tools that have been developed can be redesigned in accordance with the needs of the characteristics of students. The development of this learning tool is not limited to one competency standard, but can be done on other competencies. Similarly, the implementation of learning that prioritizes practicum with the direction of developing students' vocational skills.

REFERENCES

Abdillah, M. A. (2013). Kelengkapan job sheet dalam meningkatkan hasil belajar mata pelajaran kelistrikan otomotif pada siswa. *Gardan*, *3*(1), 1–10.

Abdul, M. (2009). *Perencanaan Pembelajaran*. PT. Remaja Rosda Karya.

Anjaya, P. D., Susilaningsih, E., & Yulianto, A. (2019). Development of assessment instruments for learning process of mathematics in drawing geometry at the elementary school level of Karanganyar Regency. *Journal of Primary Education*, *8*(3), 309–314.

Apriliana, F., & Warju, W. (2013). Pengembangan modul Engine Tuner EA-800A pada mata kuliah praktek Motor Bensin di Jurusan Pendidikan Teknik Mesin Fakultas Teknik Universitas Negeri Surabaya. *JPTM*, *01*(02).

Arantes do Amaral, J. A., Gonçalves, P., & Hess, A. (2015). Creating a project-based learning environment to improve project management skills of graduate students. *Journal of Problem Based Learning in Higher Education*, *3*(2), 120–130.

Arantes do Amaral, J. A., & Lino dos Santos, R. J. R. (2018). Combining project-based learning and community-based research in a Research Methodology course: The lessons learned. *International Journal of Instruction*, *11*(1), 47–60. https://doi.org/10.12973/iji.2018.1114a

Arends, R. I. (2001). *Exploring teaching: An introduction to education*. Mc Graw-Hill Companies.

Aydın, S., Atalay, T. D., & Göksu, V. (2018). Project-based learning practices with secondary school students. *International Online Journal of Educational Sciences*, *10*(3), 230–242. https://doi.org/10.15345/iojes.2018.03.015

Baghoussi, M., & El Ouchdi, I. Z. (2019). The implementation of the project-based learning approach in the Algerian EFL context: Curriculum designers' expectations and teachers' obstacles. *Arab World English Journal*, *10*(1), 271–282. https://doi.org/10.24093/awej/vol10no1.23

Chiang, C. L., & Lee, H. (2016). The effect of project-based learning on learning motivation and problem-solving ability of vocational high school students. *International Journal of Information and Education Technology*, *6*(9), 709–712. https://doi.org/10.7763/IJIET.2016.V6.779

Damayanti, N. K. A., Martha, I. N., & Gunatama, G. (2014). Pembelajaran menulis teks anekdot berpendekatan saintifik dengan model pembelajaran berbasis proyek (project based learning) pada siswa kelas X Tata Kecantikan Kulit 1 di SMK Negeri 2 Singaraja. *Jurnal Pendidikan Bahasa dan Sastra Indonesia Undiksha*, *2*(1), 1–10. http://dx.doi.org/10.23887/jjpbs.v2i1.3283

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

Dick, W., Carey, L., & Carey, J. O. (2015). *The systematic design of instruction* (8th ed.). University of South Florida.

Faridah, W. N., & Warju, W. (2014). Pengembangan modul pembelajaran Injector Tester dan Ultrasonic Cleaner CNC-601A pada mata kuliah Praktik Motor Bensin Program Studi S-1 Pendidikan Teknik Mesin. *JPTM*, *02*(03), 58–66.

Fatkhurrokhman, M., Permata, E., Ekawati, R., & Rizal, S. U. (2017). Pengembangan perangkat pembelajaran teknik digital berbasis project based learning di Jurusan Pendidikan Teknik Elektro. *Jurnal Pendidikan Vokasi*, *7*(1), 101. https://doi.org/10.21831/jpv.v7i1.12547

Febriana, R. (2017). The effectiveness of project based learning on students' social attitude and learning outcomes. *Jurnal Pendidikan Teknologi Dan Kejuruan*, *23*(4), 374–382. https://doi.org/10.21831/jptk.v23i4.14878

Gerhana, M. T. C., Mardiyana, M., & Pramudya, I. (2017). The effectiveness of project based learning in trigonometry. *Journal of Physics: Conference Series*, 1–6. https://doi.org/10.1088/1742-6596/895/1/012027

Habók, A., & Nagy, J. (2016). In-service teachers' perceptions of project-based learning. *SpringerPlus*, *5*(83), 1–14. https://doi.org/10.1186/s40064-016-1725-4

Hamid, M. A., Aribowo, D., & Desmira, D. (2017). Development of learning modules of basic electronics-based problem solving in Vocational Secondary School. *Jurnal Pendidikan Vokasi*, *7*(2), 149. https://doi.org/10.21831/jpv.v7i2.12986

Handoyo, L. D., & Listyarini, I. Y. (2018). Development of character assessment instruments in service-learning at Biology Education Department Sanata Dharma University. *International Journal of Indonesian Education and Teaching*, *2*(1), 71–79. https://doi.org/10.24071/ijiet.2018.020108

Harmer, N., & Stokes, A. (2014). The benefits and challenges of project-based learning: A review of the literature. *Pedagogic Research Institute and Observatory (PedRIO)*.

Hoesny, M. U. (2013). From syllabus design to curriculum development. *Jurnal Linguistik Terapan*, *3*(1), 1–10.

Ismuwardani, Z., Nuryatin, A., & Doyin, M. (2019). Implementation of project based learning model to increased creativity and self-reliance of students on poetry writing skills. *Journal of Primary Education*, *8*(1), 51–58. https://doi.org/10.15294 /jpe.v8i1.25229

Jaime, A., Blanco, J. M., Dominguez, C., Sanchez, A., Heras, J., & Usandizaga, I. (2016). Spiral and project-based learning with peer assessment in a Computer Science Project Management Course. *Journal of Science Education and Technology*, *25*(3), 439–449.

Jumargo, J., Boenasir, B., & Ramelan, R. (2011). Peningkatan prestasi belajar kompetensi melakukan pekerjaan dengan mesin bubut menggunakan jobsheet hasil pengembangan. *Jurnal Pendidikan Teknik Mesin*, *11*(02), 57–62.

Kricsfalusy, V., George, C., & Reed, M. G. (2018). Integrating problem- and project-based learning opportunities: Assessing outcomes of a field course in environment and sustainability. *Environmental Education Research*, *24*(4), 593–610. https://doi.org/10.1080/13504622.2016.1269874

Kunandar, K. (2013). *Penilaian autentik (Penilaian hasil belajar peserta didik berdasarkan Kurikulum 2013*. Grafindo Persada.

Martiningsih, I., & Susilowati, S. M. E. (2019). Development of module based on scientific contextual additives material to increase learning outcomes and science process skills in junior high school. *Journal of Innovative Science Education*, *8*(2), 128–137. https://doi.org/10.15294/JISE.V0I0.27790

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

Mauliana, M., Ikhsan, M., & Subianto, M. (2018). Development of learning tool with contextual teaching and learning (CTL) approach to improve student mathematical connection ability. *Journal of Physics: Conference Series*, 1–5. https://doi.org/10.1088/1742-6596/1088/1/012012

Mozas, A., & Barba-Colmenero, F. (2013). System for evaluating groups when applying project-based learning to surveying engineering education. *Journal of Professional Issues in Engineering Education and Practice*, *139*(4), 317–324. https://doi.org/10.1061/(ASCE)EI.1943-5541.0000160

Muslim, M., Martias, M., & Nasir, M. (2019). Correlation of activities learning with learning outcomes student in vocational high school. *VANOS Journal of Mechanical Engineering Education, 4*(2), 45–56. http://dx.doi.org/10.30870/vanos.v4i2.6349

Nurhasanah, A., Subekti, S., & Patriasih, R. (2017). Analisis penggunaan jobsheet pada praktikum dasar boga di SMKN 9 Bandung. *Media Pendidikan, Gizi dan Kuliner, 6*(2), 1–8.

Prasetyo, Z. K. (2011). *Pengembangan perangkat pembelajaran Sains terpadu untuk meningkatkan kognitif, keterampilan proses, kreativitas serta menerapkan konsep ilmiah peserta didik SMP*. Universitas Negeri Yogyakarta.

Prosser, C. A., & Quigley, T. H. E. (1950). *Vocational education in a democracy* (Revised ed.). American Technical Society.

Purnamasari, V., & Wangid, M. N. (2016). Pengembangan perangkat pembelajaran berbasis scientific aproach untuk membangun karakter kepedulian dan kedisiplinan. *Jurnal Pendidikan Karakter, 6*(2), 167–180. https://doi.org/10.21831/jpk.v6i2.12047

Rusman, R. (2012). *Belajar dan pembelajaran berbasis komputer: Mengembangkan profesionalisme guru abad 21*. Alfabeta.

Sabbah, S. S. (2018). English language syllabuses: Definition, types, design, and selection. *Arab World English Journal*, *9*(2), 127–142. https://doi.org/10.24093/awej/vol9no2.9

Sailin, S. N., & Mahmor, N. A. (2018). Improving student teachers' digital pedagogy through meaningful learning activities. *Malaysian Journal of Learning and Instruction*, *15*(2), 143–173. https://doi.org/10.32890/mjli2018.15.2.7786.

Sari, B. K. (2017). Desain pembelajaran model ADDIE dan implementasiinya dengan teknik Jigsaw. *Desain Pembelajaran di era ASEAN Economic Community (AEC) untuk Pendidikan Indonesia Berkemajuan*, 87–102. http://eprints.umsida.ac.id/332/

Sari, V. P. E., & Mukhadis, A. (2017). The effect of problem-based learning with gallery project and locus of control on learning achievement. *Jurnal Pendidikan Teknologi Dan Kejuruan*, *23*(4), 392–401. https://doi.org/10.21831/jptk.v23i4.14713

Serevina, V., Sunaryo, S., Raihanati, R., Astra, I. M., & Sari, I. J. (2018). Development of e-module based on problem based learning (PBL) on heat and temperature to improve student's science process skill. *The Turkish Online Journal of Educational Technology, 17*(3), 26–36.

Shin, M.-H. (2018). Effects of project-based learning on students' motivation and self-efficacy. *English Teaching*, *73*(1), 95–114. https://doi.org/10.15858/engtea.73.1.201803.95

Shofwanthoni, A., Ridlo, S., & Elmubarok, Z. (2019). The development of authentic assessment instrument of Hajj Manasik practices of IX grade of SMP PGRI 10 Candi in Sidoarjo Regency. *Journal of Educational Research and Evaluation*, *8*(1), 14–21. https://doi.org/10.15294/JERE.V8I1.28361

Soivan, S., & Rijanto, T. (2018). Pengembangan job sheet trainer Human Machine Interface (HMI) sebagai bahan ajar siswa pada mata pelajaran Instalasi Motor Listrik di SMK Negeri 3 Surabaya. *Jurnal Pendidikan Teknik Elektro*, *07*(02), 159–165.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29564

Sugiyono, S. (2017). *Metode penelitian pendidikan (Pendekatan kuantitatif, kualitatif dan R&D)*. Alfabeta.

Suhadi, S. (2007). *Petunjuk perangkat pembelajaran*. Universitas Muhammadiyah.

Syarif, M. (2016). *Strategi pembelajaran*. Rajawali Pers.

Trianto, T. (2014). *Model-Model pembelajaran inovatif berorientasi konstruktivistik*. Prestasi Pustaka.

Wahyuni, V., Kartono, K., & Susiloningsih, E. (2018). Development of project assessment instruments to assess mathematical problem solving skills on a project-based learning. *Journal of Educational Research and Evaluation*, *7*(2), 147–153.

Wekesa, N. W., & Ongunya, R. O. (2016). Project based learning on students' performance in the concept of classification of organisms among secondary schools in Kenya. *Journal of Education and Practice*, *7*(16), 25–31.

Widyastuti, R., & Utami, I. S. (2018). Development of product-based job sheet as instructional media in vocational education. *Journal of Educational Science and Technology (EST)*, *4*(2), 119. https://doi.org/10.26858/est.v4i2.6064

Wiliam, D. (2013). *Assessment: The bridge between teaching and learning* (Vol. 21). National Council of Teachers of English. www.dylanwiliam.net

Winatha, K. R., & Abubakar, M. M. (2018). The usage effectivity of project-based interactive e-module in improving students' achievement. *Jurnal Pendidikan Teknologi Dan Kejuruan*, *24*(2), 198–202. https://doi.org/10.21831/jptk.v24i2.20001

Yulaelawati, E. (2004). *Kurikulum dan pembelajaran*. Pakar Raya.

Zancul, E. de S., Sousa-Zomer, T. T., & Cauchick-Miguel, P. A. (2017). Project-based learning approach: Improvements of an undergraduate course in new product development. *Production*, *27*(spe), 1–14. https://doi.org/10.1590/0103-6513.225216

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

Jurnal Pendidikan Vokasi
Volume 10, No. 1, 2020 (34-43)
Online: http://journal.uny.ac.id/index.php/jpv

EXPERIENTIAL-BASED TRAINING TO IMPROVE LITERACY SKILLS OF TRADITIONAL GAME FOR TOURISM WORKERS

Entoh Tohani[1]*, Sugito[1]
[1]Universitas Negeri Yogyakarta
Jl. Colombo No. 1, Karangmalang, Depok, Sleman, Yogyakarta 55281, Indonesia

Abstract

This research aims to develop the literacy skills on the traditional game for tourism village workers through experiential-based training. Traditional game literacy is attitudes, knowledge, and skills in managing traditional games to make it more meaningful for life, sustainable, and keep people away from negative social changes. This research is participatory action research and conducted on 25 workers located in the Yogyakarta batik tourism village. Data collected and analyzed by using qualitative methods. The research results showed that the action of skill development able to the target group realized the importance of traditional game literacy in the context of developing tourism services, having the ability to manage tourism services based on traditional games, and forming traditional game tourism management. Therefore, this skill development needs to be carried out continuously and meaningfully by optimizing the involvement of all parties involved in tourism development.

Keywords*: literacy, games, experiential training, improvement, tourism*

How to cite: Tohani, E., & Sugito, S. (2020). Experiential-based training to improve literacy skills of traditional game for tourism workers. *Jurnal Pendidikan Vokasi*, *10*(1), 34-43. doi:https://doi.org/10.21831/jpv.v10i1.28193

***Corresponding Author:** Entoh Tohani entoh_tohani@uny.ac.id
Department of Non-Formal Education, Faculty of Education, Universitas Negeri Yogyakarta
Jl. Colombo No. 1, Karangmalang, Depok, Sleman, Yogyakarta 55281, Indonesia

https://doi.org/10.21831/jpv.v10i1.28193

INTRODUCTION

The development of tourism villages is currently encouraging as employment in the field of tourism can absorb labor and solve the problem of unemployment. In Indonesia, the development reached 1,734 villages spread across Java, Bali, Sumatra, East of Nusa Tenggara, Kalimantan, Papua, and Sulawesi (Putra, 2018). In the long run, it is expected that the community will have income from developing potential in the area to create a prosperous community life that can be started by carrying out productive activities in an area by exploring local wisdom and potential that can be used as a means to increase the income of citizens (Korten, 1986). The tourism village could be interpreted as a form of integration between attractions, accommodation, and supporting facilities that are presented in a structure of community life that integrates with applicable procedures and traditions. An area defined to be a tourist village must consider several factors, including scarcity, naturalness, uniqueness, and community empowerment (Kurniawan & Prakoso, 2008).

Economically, the presence of tourism villages has an economic impact on the community in the form of expanding employment or vocational opportunities and increasing needs for goods and services (Fennel, 2003; Goeldner & Ritchie, 2012). One of the impacts is that tourism gives to a variety of vocational activities that could be a source of living income. Activities of tourism can develop jobs related to or support its function, such as tourist scouting, culinary production, accommodation, and hotel services, education, construction, creative industries, etc. (Hiariey & Sahusilawane, 2013; Hiryanto et al., 2017). These will become opportunities to be entered by members of the community both individually and groups so that they must be prepared to have suitable competencies according to these jobs in the context of effective tourism development.

The development of tourism villages needs to be optimally carried out by utilizing various local wisdoms, both the latent ones and those already manifested in the community. One of the local wisdoms is traditional games that have long been developed in the community. Those games can be a means to provide more meaningful tourism services for visitors. For example, the educational tourism village of Wukirsari, Imogiri, Bantul, besides having *batik* tourism potential, which is characterized by the presence of 25 *batik* home industries, it also offers various traditional games such *as jaranan, jamuran, engklek, gobak sodor, enggrang, wayang dan payung kertas, kentongan, othok-othok* which can be used as another meaningful tourist program for visitors (Tohani & Sugito, 2019). These games need to be developed so that educational tourism activities become more varied in providing educational nuances that are more exciting and more interesting.

The importance of traditional games, both individual and collective types, is inseparable from the view that the game becomes a means of learning transferability, showing the inculcation of virtue values and the development of positive individual behavior, and as a means of individual entertainment (Blumberg, 2014). According to Chen (2005), games for learning can be student-centered, develop communicative competence and motivation, reduce learning anxiety, develop creativity, and encourage student participation. Traditional games have the benefit of developing self and community quality. Individual games can improve the values and abilities of sportsmanship, discipline, competition, motoric abilities, conflict resolution, creativity, confidence, logical-critical-analytical thinking, and achievement (Baek, 2010; White, 2011). Socially, traditional games also become a means of transmitting or preserving culture in the form of values, knowledge, behavior, and artifacts that are conveyed by the previous generation to the next generation. In the end, by improving and developing traditional games, cultural literacy will cultivate the ability to love, understand, develop culture, the ability to be open to learning other cultures and sharing one's own culture, to change personal perspectives, to communicate effectively across cultures, and to act as agents of cultural change (Hirsch et al., 2002).

Unfortunately, in the development of tourism villages, especially those with educational purposes, traditional games' potential has not been managed optimally. Many developing tourism villages offer tourism service programs in the form of natural beauty exploration or ecotourism or only focus on tourism introducing culture, history, and people's lifestyles. In *batik* education tours, educational tourism activities are manifested in the form of a one-hour program for students in which they can learn to make a *batik tulis*, starting from the introduction of *canting* and *lorot* process to the coloring process (Tohani & Sugito, 2019). Likewise, other research shows that opti-

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28193

mization of tourism programs based on the use of traditional games has not yet taken place and this game is more widely used in the context of formal education and early childhood education (Anam et al., 2017; Hidayat, 2013; Pramudyani et al., 2017; Sulistyaningtyas & Fauziah, 2019). Of course, optimizing the use of traditional games in the development of educational tourism villages is determined by the quality of human resources, especially workers of the existing tourism villages. Workers who are competent in managing tourism activities ensure the existing tasks and functions can be carried out effectively, such as learning functions, environmental management, services to visitors, marketing, etc.

Training based on experiential learning as an effort to develop the ability of tourism workers needs to be done with the aim of equipping the workers to have the latest skills and knowledge to manage tourism services and tourism resources they have in order to improve the quality of life for themselves and their communities. It is an educative action to develop individual abilities by understanding, utilizing, and developing experiences owned by individuals, as a result, substance and learning outcomes. In this learning, individuals actively think and transform experiences as a basis for learning (Kolb, 2015). They are involved in feeling, seeing, reflecting, thinking, and acting along with interactions with the environment (experience). This learning emphasizes the internal processes of individuals who transform new and significant experiences and incorporate them in a broader conceptual framework (Beard & Wilson, 2013; Gonzalez-Perez & Taras, 2015; Ramsgaard, 2018). The effectiveness of this learning is demonstrated in a number of findings that show experience-based learning for adults can enhance new skills in accordance with the new jobs (Sisselman-Borgia & Rorino, 2017), professional competence (Istiningrum, 2015; Sepdanius et al., 2018), emotional adult learners (Zeivots, 2016), and improve critical thinking (Heinrich et al., 2015) and communication with others (Alvarez & Schultz, 2018).

The effectiveness of experiential training depends on the facilitation of learning undertaken by educators. According to Smith & Betts (2000, in Beard & Wilson, 2013, p. 18), the learning process can be done with the principle of learning through experience (through), learning about informational (about), and practicing (at work). All three must be associated with the target groups' experiences, such as tourism management, scouting, tourism marketing program practices, interactions in tour groups, etc. Both positive and negative experiences can be used as substances and learning methods. Therefore, facilitation for learning must be developed with the awareness that citizens are individuals who have experiences and can interpret their own experiences so that learning needs to be designed to provide opportunities for learning citizens to interact directly with the environment.

Related to those matters, this research is conducted to develop tourism workers' ability to provide meaningful tourism services for visitors through the implementation of a learning process based on the utilization and development of experiences owned by tourism workers. This learning was done as an instrument to shape their ability to become competent human resources capable of developing tourism services that are meaningful to both individuals and the community.

RESEARCH METHOD

This research used an action research approach that was intended to develop traditional games' literacy skills for tourism village workers in the context of developing community life through experiential learning. The action research model used was a participatory action research model as it serves as a model of appropriately conducted training in the society life and emphasizes the partnership of actors in empowerment in the learning process or community development. The implementation of activities was cyclical/spiral, namely: understanding issues/ problems, planning actions, implementing actions, and reflecting to improve action plans (McIntyre, 2007). In this study, the intended action was an experience-based training process imposed on the target group. The actions were carried out in one research cycle. Determination of actions must be formulated collaboratively between the researchers and the target group.

Data collection was carried out by interview and observation in accordance with the implementation at each stage of the intended action research. Using the interview guidelines, interviews conducted openly with the tourism village workers, members of the village tourism com-

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28193

munity, educators, members of the suggestion group, and *batik* craftsmen at the study site. The interview aimed to gather information about tourism village activities, tourism services, manager development needs, tourism opportunities, etc. and conducted individually and in groups/discussions with research subjects by first making a commitment to the interview time and place. Observations were also carried out by researchers assisted by technical staff to find out the activities of tourism management carried out by the target group, the learning process that occurred, the use of traditional games, and the community environment. The researchers used observation guidelines that were previously designed and validated by relevant experts. In collecting data, they worked closely with the head of the target group. During and after the data collection process, the data analyzed using qualitative analysis techniques and emphasized reflection with researchers and the target group.

This action research was conducted from June to August 2019 and located in Wukirsari Village, Imogiri, Bantul Regency. The participants of this study were the workers of Giriloyo (GR) tourism village numbering 25 people. They consisted of 10 men and 15 women who were active and incorporated in the Giriloyo tourism village management association. The selection fell upon this target group due to the presence of those who were active in developing the quality of community life, especially in tourism in the village. The determination of research participants was carried out directly with the village tourism community's management and by considering the willingness and availability of participant time and implementation time.

RESULTS AND DISCUSSION

The study results can be described by referring to the stages of participatory action research consisting of needs analysis, planning, implementation, and evaluation of learning.

Needs Analysis

Needs analysis to increase traditional game literacy for village tourism workers in the context of developing meaningful tourism was done by collecting data directly from the target group through interviews and joint discussions. Interviews were conducted with representatives of the target group, community leaders, and batik group administrators by first asking for willingness and agreement for the interview. Discussions were conducted between researchers, target groups, and workers of the tourism village community. The results of data analysis indicated that the target group did not master the ability to manage traditional game literacy although they were directly involved in providing tourist services to visitors. This was observable through the tourism services that they developed lack varieties and rely more on one type of tourism service, namely, batik learning services. In fact, the community environment has a potential based on culture and/or tradition that has not been utilized or integrated into the existing tourism services. One of them is various traditional games within the community, such as engrang, gobak sodor, dakon, etc. The game needed to be developed and deemed relevant to the tourism program to develop tourism services based on tradition and education. They realized that this cultural richness can be put in tour packages for visitors. Lately, traditional games have not been practiced daily, so they deemed it necessary to preserve them. According to the chairman of the association:

> *Tour visitors are generally students, from schools. Yes, (they) come each month with an average of 500 people, but they only come briefly around an hour, just practice batik, then go home ... They actually want to stay longer, but we have not been able to make another tourism object. Our plan is to make a homestay, traditional outbound game, and educative to increase the amount of income.*

In addition, in joint discussions between researchers and target groups, an alternative was discussed, and it was about how to improve the literacy skills of traditional games. Before the agreement, the researchers gave an insight into the importance of developing more productive tourism based on local activities and emphasized the need for traditional games to be developed into an educational tourism package that attracts visitors. Adopting the researchers' view, the target group had a desire to improve its ability to manage tourism services in the city. At the end of the

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28193

discussion, the researchers and the target group agreed that the improvement of traditional game literacy skills should be done in the form of experiential learning.

Planning

Based on the agreement about the efforts to improve traditional games' literacy through experiential training, researchers worked with representatives of target groups and community leaders to determine learning plans. The researchers first designed a series of learning activities and then presented them to the target group's representatives. In this discussion, group representatives gave feedback, some of them were plan rescheduling, so learning time did not coincide with social activities in the community, resource persons wanted from outside the manager, and requests for the preparation of traditional game equipment. The learning plan prepared by researchers and agreed with the target groups is described in Table 1.

Table 1. Plan on the Experience-Based Training

Phase	Purpose	Method	Material/Media	Days to- / Hour
Awareness	• Building the awareness of target groups about the potential of traditional games and tourist services. • Building agreements and commitments.	Lecture Brainstorming	HVS paper, ballpoint, booknote, speaker	1 / 4
Learning Process	• Providing attitudes, knowledge and skills to the target group regarding the design of traditional game-based tourism	Lecture Discussion	Plano paper, marker, speaker, module	2 / 8
	• Providing attitudes, knowledge, and skills to the target group regarding the ability of traditional games tour guides	Discussion Practice Simulation	Tools used for traditional games, module	2/ 6
	• Developing guiding skills, design traditional game-based travel services	Assignment	Tools used for traditional games, module	3 / 8
	• Improving the ability of tour group management in developing tour services	Assignment	Book note, ballpoint	3/ 3
	• Facilitating target groups in managing groups	Consultation	Book note, Ballpoint	Tentative
Evaluation	• Identifying the learning outcomes and understanding and commitment of the target group to implement learning outcomes	Joint reflection	Book note, ballpoint	4/ 4

Learning Process

Experience-based training in order to improve the referred capability was done by stages: awareness, learning, and joint reflection. The awareness phase was carried out by the target group in the form of a joint discussion about the development of GR tourism to a more advanced level through the use of traditional arts and games. The discussion, taking place in a very friendly and warm atmosphere, began with the researchers giving an explanation of the purpose of the discussion and clues about how the tour manager should seize the opportunity, especially with many tourists visiting the *batik* village of GR. The target groups gave their views alternately based on the participants' knowledge. The discussion results showed the target group realized that the GR environment was very effective in developing the tourism sector in addition to the only and already existing *batik* tourism. The big potential was traditional markets, *batik* centers, religious tourism,

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28193

campsites, traditional health centers (*gurah*), traditional games, etc. These potentials were still undeveloped because they did not have the knowledge and skills to manage these potentials. In addition, the target group also had a strong desire to develop their abilities and hoped for learning opportunities.

The learning process was carried out as planned. The learning process was about innovation in travel. The purpose of this learning was that citizens learn to have the view that in managing tourism, it is necessary to take action or innovative ways so that tourism can develop optimally and provide great benefits. Innovative actions enable economic activities in the tourism sector to become more diverse and provide a large opportunity to earn income. The submission of the material was done by researchers in a family atmosphere and using the local language (Java). The researchers explained the importance of local-potential-based tourism innovation is. He gave an example of innovation in the management of tourism in the form of tourist activities and educational activities, which is popularly known as educative tourism. The researchers also informed the learners that this educative tourism has recently developed in society. The learning was considered a success. This success was concluded when the researchers believed citizens actively learned to understand the concept of innovation in tourism management, as indicated by the comments of a learning resident who agreed with the researchers' view.

Subsequent learning was devoted to developing the literacy skills of *batik* and traditional games for village workers of *batik* education tours, followed by experience-based learning conducted by speakers from an experiential learning association. This learning intended to build the target group's understanding of how to formulate tourism programs using traditional arts and games. The learning process was started by the researchers, who opened the learning and conveyed the learning objectives. In this initial learning session, the resource person asked the residents to learn to reflect on what abilities they already had or wanted to have in managing tourism activities. The reflection results were written on four small pieces of paper and displayed by sticking them to a pole in the study room. Various expressions on the results of reflection were seen in the display. For example, there were those who wrote about the wish to be able to communicate well, have the courage to appear in forums, have a stable income, become a reliable tour guide, become a professional, etc.

Following this, the target group was divided into four small groups with five members each. Each group was given a task to study what tourism programs might be developed and how the tourism program's technical implementation would be. In the learning process, the activeness of the participants was reflected in the behavior of each member discussing and giving opinions. The results of the discussion were then presented to other groups by each small group. Researchers' observation showed that each group could produce ideas or program that can be designed, with the examples of the first group conveying their thoughts in the form of tourism activities such as bicycle tours, snacks at traditional markets, homestay, traditional game outbound, etc. including a time plan for the sequence of tourist activities which would be carried out. Other groups also responded to both suggestions and asked questions in this discussion session. For example, members of other groups asked who would train the outbound activities and the possible time if the outbound was conducted. All groups carried out the presentations in turn.

The next lesson was developing the ability to lead tours by using traditional game media present in the surrounding community. In this learning session, the researchers collaborated with speakers who already had experiences in the development of tourism services. Previously, the resource persons in the research introduced various types of games, both individual and group games such as *enggrang, dakon, gobak sodor, bakiak,* etc. intending to have the target group recall games that were no longer practiced by many community members, build awareness to awaken the cultural heritage in question, and know the great benefits of its existence.

Furthermore, the resource persons also asked them to return to their respective small groups to formulate scenarios for how traditional games were performed for special visitors to the students. The aim of this learning was to make the target group have an effective reference when directly practicing tourism activities that use traditional games. Small group discussions went well where interaction between learning citizens was very communicative. Learning citizens' exchange of opinions was seen in the process of the formulation of scenarios. The results of the discussion were delivered by each small group to other groups in turn. The small group representatives inter-

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28193

acted communicatively what the group produces. Observation on the learning process activities showed that each group was able to create a game implementation scenario as outlined in a cardboard sheet in accordance with their respective assignments. For example, the fifth group provided an overview of the series of implementation of tourism services from the beginning to the end. According to them, visitors were served starting from homestay preparations, touring villages, visits to traditional markets, traditional outbound games, etc. Those activities had a plan on time allocation and their implementation. Each small group produced a plan or scenario for the implementation of tourism that was considered in accordance with environmental conditions. With regard to group results, the resource persons provided input and suggestions so that the scenarios made must be clear and coherent.

The next lesson was to play the role of traditional game tour guides. In this process, each group played the role of a traditional game guide, and the other group members took the role of visitors who can go to the tourist sites based on the scenario that had been made. The role-playing session took place in a pleasant atmosphere, in which those who had never played those traditional games, or those who once had forgotten how to play those traditional games, actively tried to practice the games, which they already had learned during the simulation session. They took turns trying to practice how to lead traditional game tours and use traditional game tools. At the end of the role-play, the resource person gave a view on the guiding practices carried out by small groups. For example, to the groups that stimulated the game grind, the resource person suggested that before starting the game, visitors must be conditioned in advance so they can concentrate, the delivery of game instructions need to be more informative, the guide can give examples, and at the end of the practice moral values of the games should be informed to the visitors. For example, the values imparted by clogs are togetherness, harmony, cooperation and the spirit of never giving up. Visitors should be told about those values after they are engaged in the game. After this session, the resource person emphasized that the target group was expected to be able to practice guiding the tour to visitors in the field by first preparing the equipment and resources needed.

On another day, the learning process occurred in the form of direct practice assignments by the target group. Learning with direct practice assignments was also carried out to develop and improve the learners' skills and ability to carry out outbound to the visitors. The target group members, in accordance with the tourism program that they already mastered, carried out the direct practice independently in the form of forming an outbound division as part of the management of the GR tourism village that aims to promote outbound tourism packages through traditional games, partnering with users, and training or organizing outbound for visitors. The management consisted of a chairman, treasurer, secretary, and members of the division. The division was formed by deliberation mechanism and based on the characteristics and abilities of group members. In addition, the target group was supposed and identified to be able to offer cooperation with junior high schools in the form of outbound implementation.

The learning activities ended with a learning evaluation activity that emphasized the principle of joint reflection. The joint reflection aimed to find out how the learning process could provide positive learning outcomes. This activity was carried out in a friendly atmosphere by forming a circular sitting position in the learning room. The resource person asked participants for their views on the activities they just experienced. Representatives of the participants gave their views alternately about how they felt after participating in this learning session.

Learning Evaluation

An evaluation of both the process and the results was carried out to make sure that learning of improving literacy skills of traditional games for tourism village workers was successful. Process evaluation was conducted by observing the learning activities of the trainees. The observations showed that the participants were quite enthusiastic about participating in the learning activities. This was evident from the class's pleasant learning atmosphere, especially in small group discussions and simulations of guiding practice of active learning citizens who conveyed opinions and questions both to other learning residents or resource persons, their desire to try games, and the courage in communicating their opinions.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28193

Learning outcomes were evaluated using interviews with the target group. The interview results show that the target group had an awareness to improve the existing tour programs into programs, including diverse tourism programs and awareness to preserve local culture, understand the motivation to develop outbound tourism through traditional games, and guide tourism through traditional games. The GR Batik community chairman revealed that they were grateful to receive lessons about scouting with traditional games and realized that the potential needed to be put into an attractive tourist service for visitors. The same thing was expressed by a resident of the learning whose initials Dyt that the learning process he participated in was quite fun, especially for residents of his age who were not familiar with traditional games. He believed the learning equipped him with the skills to guide tours utilizing the traditional games. Even an enthusiastically studying female learner revealed that "we are happy to have received this training. We are recalling the past games ... This is an arena for us to strive to preserve culture as a legacy so that it is not extinct".

Learning outcomes also incited a change in the GR batik community group after learning occurred. The change took place to form an association that handled traditional game outbound tourism division as per the agreement with the learning citizens and the association's management. This division was assigned to promote tour packages, especially outbound packages to visitors. Besides, the target group was able to offer visitors the outbound tourism package. One of the proofs of such an ability was an offer of outbound cooperation with a junior high school in Yogyakarta.

Discussion

The training process carried out toward this research target aimed to equip the targets with attitudes, knowledge, and skills in using traditional games to become learning tools for individuals or groups. This ability is an asset to benefit from opportunities available in the community that has not been used optimally. In order to achieve this goal, experiential-based training became the right approach that allowed the target group to master the expected abilities. The implementation of this learning was using learning methods that led to understanding the target group's experiences, namely joint discussion, brainstorming, simulation practice, and assignments. The changes in the target group's positive behavior showed that the target group mastered the competencies that were expected from the learning process. This proves the hypothesis that learning process can facilitate the target group to form and transform knowledge (Kolb, 2015).

In the context of empowering the community of tourism actors, building individual or community capacity can be done by organizing varied and meaningful experience-based learning according to the needs of the development of local-wisdom-based tourism. Tourism development requires individuals' readiness and ability to plan, manage, and evaluate various tourism activities such as developing tour packages, developing tourism management, developing human resources, and community participation. As a bridge between concepts and theory, the experience used in the development of these abilities needs to be considered and determined better to provide the benefits of continuous learning, challenging, and growing growth (Dewey, 1997). Therefore, experience-based learning that is humanist, participatory, and focused on developing competencies for tourism management based on local wisdom can be done, such as using community project methods, analyzing the development of empowerment programs, and forming effective learning groups.

The target group's local wisdom is a source of experiences that community developers must recognize as an asset to empower them in advancing tourism activities. This is inseparable from the view that local wisdom contains various latent and manifest potentials that can be utilized to benefit tourism development or other empowerment so that its existence needs to be managed effectively. As a form of ownership of the experience, local wisdom needs to be managed to benefit tourism development. Local wisdom management can begin with how the target group builds awareness of the existence and usefulness of the intended potential objectively, equips itself with the knowledge to manage the potential the local wisdom has, is given the capacity and ability to design the use of local wisdom, and develops abilities to work on the local wisdom. It is recognized that a narrow view, counter-destructive behavior, unwillingness to change, and resistance toward renewal can be an obstacle to individuals who can manage local wisdom. Therefore, efforts are needed to minimize these obstacles and not have a major negative impact on tourism development

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28193

implementation. Thus, from the beginning, it is necessary to carry out an educational process that leads to the formation of individual behavior to continue learning both self and community interests such as conducting focused discussions about the potential and problems faced by the community, planning joint development of tourism, opening forums for sharing experiences, etc.

CONCLUSION

Based on the results of the activities and discussion, it is concluded that the activity of improving the literacy ability of traditional games for tourism actors in the framework of developing tourism activities becomes one of the empowerment alternatives which, in the end, can create a prosperous society. These development activities can provide positive learning outcomes for learning citizens, including: learning residents have awareness toward their potential and their uses, obtain knowledge and skills in learning visitors through traditional games, and form traditional game tour guide groups. Thus, sustainable empowerment is needed for tourism workers so that tourism development can lead to the development of sustainable tourism based on the use of local potential owned by the community, accompanied by the development of the target group's commitment in carrying out its functions and roles in practicing the ability to guide tourism to visitors.

REFERENCES

Alvarez, S., & Schultz, J.-H. (2018). A communication-focused curriculum for dental students – an experiential training approach. *BMC Medical Education*, *18*(1), 55. https://doi.org/10.1186/s12909-018-1174-6

Anam, S., Ovaleoshanta, G., Ardiansyah, F., & Santoso, D. A. (2017). Studi analisis budaya permainan tradisional Suku Osing Kabupaten Banyuwangi. *SPORTIF*, *3*(2), 178–191. https://doi.org/10.29407/js_unpgri.v3i2.11911

Baek, Y. (2010). *Gaming for classroom-based learning: Digital role playing as a motivator of study*. Information Science Reference.

Beard, C., & Wilson, J. P. (2013). *Experiential learning: A best practice handbook for educators and trainers*. Kogan Page.

Blumberg, F. J. (2014). *Learning by playing: Frontiers of video gaming in education*. Oxford University Press.

Chen, I.-J. (2005). Using games to promote communicative skills in language learning. *The Internet TESL Journal*, *11*(2). http://iteslj.org/Techniques/Chen-Games.html

Dewey, J. (1997). *Democracy and education*. The Pennsylvania State University.

Fennel, D. A. (2003). *Ecotourism: An introduction*. Routledge.

Goeldner, C. R., & Ritchie, J. R. B. (2012). *Tourism: Principles, practices, philosophies*. John Wiley & Sons.

Gonzalez-Perez, M. A., & Taras, V. (2015). Conceptual and theoretical foundations: Experiential learning in international business and international management fields. In V. Taras & M. Gonzalez-Perez (Eds.), *The Palgrave handbook of experiential learning in international business* (pp. 12–16). Palgrave Macmillan.

Heinrich, W. F., Habron, G. B., Johnson, H. L., & Goralnik, L. (2015). Critical thinking assessment across four sustainability-related experiential learning settings. *Journal of Experiential Education*, *38*(4), 373–393. https://doi.org/10.1177/1053825915592890

Hiariey, L. S., & Sahusilawane, W. (2013). Dampak pariwisata terhadap pendapatan dan tingkat kesejahteraan pelaku usaha di kawasan wisata Pantai Natsepa, pulau Ambon. *Jurnal Organisasi Dan Manajemen*, *9*(1), 87–105. https://jurnal.ut.ac.id/index.php/jom/article/view/40

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28193

Hidayat, D. (2013). Permainan tradisional dan kearifan lokal Kampung Dukuh Garut Selatan Jawa Barat. Jurnal Academica Fisip Untad. *JURNAL ACADEMICA Fisip Untad*, *5*(2), 1057–1070. http://jurnal.untad.ac.id/jurnal/index.php/academica/article/view/2244

Hirsch, E. D., Kett, J. F., & Trefil, J. (2002). *The new dictionary of cultural literacy: What every American needs to know*. Houghton Mifflin.

Hiryanto, H., Wibawa, L., & Tohani, E. (2017). Dampak ekonomi dan sosial wisata alam berbasis masyarakat dalam konteks pemberdayaan masyarakat: Studi kasus pada Desa Wisata Bejiharjo, Kec. Karangmojo, Kab. Gunungkidul. *Jurnal Penelitian Ilmu Pendidikan*, *10*(2), 149–160. https://doi.org/10.21831/jpipfip.v10i2.17908

Istiningrum, A. A. (2015). Efektivitas Open-Ended Experiential Learning Cases dalam peningkatan pertimbangan profesional. *Jurnal Cakrawala Pendidikan*, *34*(1), 47–57. https://doi.org/10.21831/cp.v1i1.4175

Kolb, D. A. (2015). *Experiential learning: Experience as the source of learning and development*. Pearson Education.

Korten, D. C. (1986). *Community management: Asian experiences and perspectives*. Kumarian Press.

Kurniawan, A., & Prakoso, B. S. E. (2008). The influence of spatial urbanization to regional condition in periurban areas of Yogyakarta. *Forum Geografi*, *22*(1), 27–43. https://doi.org/10.23917/forgeo.v22i1.4924

McIntyre, A. (2007). *Participatory action research*. SAGE Publications.

Pramudyani, A. V. R., Kurniawan, M. R., Rasyid, H., & Sujarwo, S. (2017). Kurikulum holistik integratif berbasis permainan tradisional pada PAUD di Yogyakarta. *Jurnal Penelitian Ilmu Pendidikan*, *10*(2), 86–96. https://doi.org/10.21831/jpipfip.v10i2.17910

Putra, D. A. (2018). *Data BPS: Indonesia miliki 1.734 desa wisata*. Merdeka.Com. https://www.merdeka.com/uang/data-bps-indonesia-miliki-1734-desa-wisata.html

Ramsgaard, M. B. (2018). Experiential learning philosophies of enterprise and entrepreneurship education. In D. Hyams-Ssekasi & E. F. Caldwell (Eds.), *Experiential learning for entrepreneurship: Theoretical and practical perspectives on enterprise education*. Palgrave Macmillan.

Sepdanius, E., Afriani, R., & Komaini, A. (2018). Standarization of experiential learning facilitator in West Sumatera. *Jurnal Cakrawala Pendidikan*, *37*(2), 294–305. https://doi.org/10.21831/cp.v37i2.19745

Sisselman-Borgia, A. G., & Rorino, G. C. (2017). Innovations in experiential learning for adult learners. *Journal of Applied Learning in Higher Education*, *7*(Spring), 3–13. https://www.missouriwestern.edu/appliedlearning/wp-content/uploads/sites/116/2018/11/JALHE-7.pdf

Sulistyaningtyas, R. E., & Fauziah, P. Y. (2019). Pengembangan buku panduan permainan tradisional untuk meningkatkan kemampuan motorik kasar anak usia 5-6 tahun. *JPPM (Jurnal Pendidikan Dan Pemberdayaan Masyarakat)*, *6*(1), 50–58. https://doi.org/10.21831/jppm.v6i1.23477

Tohani, E., & Sugito, S. (2019). Innovation needs, social capital, and learning process of batik craftsmen. *Jurnal Economia*, *15*(1), 17–33. https://doi.org/10.21831/economia.v15i1.22799

White, J. (2011). *Playing and learning outdoors: Making provision for high-quality experiences in the outdoor environment*. Routledge.

Zeivots, S. (2016). Emotional highs in adult experiential learning. *Australian Journal of Adult Learning*, *56*(3), 353–373. https://www.ajal.net.au/emotional-highs-in-adult-experiential-learning/

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

Jurnal Pendidikan Vokasi
Volume 10, No. 1, 2020 (44-55)
Online: http://journal.uny.ac.id/index.php/jpv

THE EVALUATION OF COMPETENCY CERTIFICATION PROGRAM THROUGH THE LSP P-1 AT VOCATIONAL HIGH SCHOOL

Budiyanto[1]*, Wardan Suyanto[1]
[1]Universitas Negeri Yogyakarta
Jl. Colombo No. 1, Karangmalang, Depok, Sleman, Yogyakarta 55281, Indonesia

Abstract

This research aims to evaluate the competency certification program's implementation through the First-Party Professional Certification Institute (LSP P-1) at SMK N 2 Klaten. The evaluation of the implementation of the competency certification program was reviewed on four aspects, e.g.: (1) context, (2) input, (3) process, and (4) product. This research is evaluation research based on the CIPP model (Context, Input, Process, Product). This research was conducted at SMK N 2 Klaten, which already had an LSP P-1license. The respondents were the principal, LSP chairman, secretary, treasurer, certification manager, chairman of the scheme committee, the competency test venue (TUK), and assessors. A questionnaire was used to collect data in this study. The data were analyzed with descriptive analysis. The result shows that: (1) the implementation of competency certification test through the LSP P-1 at State Vocational High School 2 Klaten in the context aspect is classified as very appropriate (83.93%), it is related to the policies and the goals of competency certification test; (2) in the input aspect is classified as very appropriate (88.82%), which meet the criteria of the assessor and the completeness of assessment tools; (3) in the process aspect is classified as very appropriate (88.59%), which leads to the suitability of the implementation procedures; and (4) in the product aspect is classified as very high (78.4%), for the achievement of competency certification test results and competency certificates.

Keywords*: program evaluation, CIPP, competency certification, LSP P-1*

How to cite: Budiyanto, B., & Suyanto, W. (2020). The evaluation of competency certification program through the LSP P-1 at vocational high school. *Jurnal Pendidikan Vokasi, 10*(1), 44-55. doi:https://doi.org/10.21831/jpv.v10i1.30155

***Corresponding Author:** Budiyanto by434178@gmail.com
Department of Technology and Vocational Education, Graduate School, Universitas Negeri Yogyakarta
Jl. Colombo No. 1, Karangmalang, Depok, Sleman, Yogyakarta 55281, Indonesia

https://doi.org/10.21831/jpv.v10i1.30155

INTRODUCTION

State Vocational High School 2 Klaten or *Sekolah Menengah Kejuruan Negeri* (SMK N) 2 Klaten is a four-year vocational high school. Before graduation, students must take the industrial field practice for six months after the final exam. SMK N 2 Klaten currently has several competency skills, among others: computer and network engineering; automotive light vehicle engineering; building construction, sanitation and maintenance; electrical power installation engineering; audio-video engineering; mechanical engineering; design modeling and building information; metal casting engineering.

SMK N 2 Klaten serves and prepares its students to become fully Indonesian people. Students who are able to improve the quality of life, develop themselves so that they can create jobs, have expertise so that they become productive workforce, the courage to open opportunities, increase income, meet the needs of business and industry workforce, prepare students to master science and technology. According to Kuswana (2013, p. 34), a person is required to have the ability to cooperate and deal with others, based on a combination of the ability to work together and communicate. Through the Ministry of Education and Culture, the government is currently encouraging all vocational students to get competency certificates. According to Colardyn (2009, p. 2778), certification is a recognition of competence. This is made clear by Tissot (2004), who states that certification is a formal process for validating the knowledge, skills, and competencies obtained by an individual by following the standard assessment procedures that have been applied. The results of the certification process are stated in certificates or certificates issued by accrediting bodies. To support this program, while 327 SMKs have obtained licenses from BNSP to establish LSP P-1 (Ministry of Education and Culture, 2017).

The number is still small compared to the number of SMK graduates each year. There are mechanisms and provisions for an institution to become a First-Party Professional Certification Agency or *Lembaga Sertifikasi Profesi Pihak* 1 (LSP P-1). There are several problems faced by SMKs in implementing competency tests through LSP P-1, one of which occurred in SMK N 2 Klaten. The implementation of LSP P-1 will be successful if it meets the requirements, one of which is by having a technical assessor determined based on the BNSP Regulation No. 10/BNSP. 303/XI/2013. According to Rizkiyah et al. (2018, p. 709), assessors came from productive teachers who attended training as assessors. Yusuf and Mukhadis (2018, p. 131) added that productive teachers are teachers who have competency certificates by their expertise and are published by BNSP. The competency test through LSP P-1 will be successful if there are professionalism and integrity of the assessor. Based on observations at SMK N 2 Klaten the LSP P-1 implementation process should require a technical assessor for each study program, but currently, there are no assessors in the technical field. It happened because there were still constraints in training costs.

The Competency Test Place or *Tempat Uji Kompetensi* (TUK) is one of the requirements that must be met in implementing the competency certification program. According to Suharto (2015, p. 39), the Competency Test Place (TUK) or Assessment Center is a good workplace or workplace simulation for conducting competency tests or assessments by Professional Certification Institutions. In the TUK at SMK N 2 Klaten, until now, there is still some competency expertise that does not meet the requirements. This happens because of the procurement of facilities and infrastructure. At SMK N 2 Klaten, there are eight expertise competencies, six expertise competencies that have fulfilled TUK requirements, and there are two expertise competencies that have not yet met TUK requirements, namely Computer and Network Engineering and Metal Casting Engineering. Certainly, it is not easy in the procurement and will require substantial costs because the assessment centers are good workplaces or workplace simulations under industry environmental standards for conducting competency tests by competency certification agencies. TUK recognition is obtained through verification by BNSP after an assessment of compliance with BNSP guidelines, and technical requirements is conducted.

The TUK is ensured and maintained by LSP through annual survey activities. TUK also needs to be developed to ensure the implementation of competency tests carried out in the workplace so that the achievement of competence is truly contextual with the environment, facilities, and workplace infrastructure. The Competency Test Place benefits are for educational and training

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30155

institutions; for industry; for labor; for professional certification bodies. In fact, the implementation of competency certification in SMK N 2 Klaten has not been able to be carried out by all majors, three majors have not met the requirements regarding TUK, so the implementation of competency tests is carried out for majors that have met the requirements.

The implementation of competency certification must meet the requirements set by the BNSP. It has been mentioned in the BNSP Regulation No. 1/BNSP/III/2014 on its attachment No. 201 regarding the scope of general requirements, including requirements for LSP, organizational structure, resources, records and information, certification schemes, certification processes, and management systems. According to Rodin (2015, p. 16), competence is defined as a benchmark to determine the extent to which a person's ability to use knowledge and abilities. Furthermore, Dobson (2003, p. 9) said that work competencies aim to ensure sufficient and adequate workforce skills to support international trade and competitiveness and provide opportunities for individuals to optimize their potential. Based on observations at SMK N 2 Klaten, there needs to be an evaluation of the competency certification program's implementation through the LSP P-1, because until now, there has been no research or study regarding this program. With the evaluation, information on the program's implementation will be obtained, then the information obtained will be reviewed and studied. The study results in the form of conclusions can be taken into consideration for the sustainability of the program.

Based on those statements, the research questions raised are (1) how is the suitability of implementing competency certification through LSP P-1 in SMK N 2 Klaten from the context aspect; (2) how is the suitability of the implementation of competency certification through LSP P-1 in SMK N 2 Klaten from the input aspect; (3) how is the implementation of competency certification through LSP P-1 in SMK N 2 Klaten from the aspect of the process; (4) how is the achievement of competency certification through LSP P-1 in SMK N 2 Klaten from the product aspect.

RESEARCH METHOD

This study is a program evaluation research using a quantitative approach, with ex-post facto type. The evaluation model in this research is CIPP. The use of the CIPP model is intended to determine the suitability and level of success of the implementation of the competency certification program through the LSP P-1 at SMK N 2 Klaten. This is done to improve and enhance the implementation of subsequent programs. The research setting is at SMK N 2 Klaten, which has been licensed by the National Professional Certification Board or *Badan Nasional Standar Pendidikan* (BNSP) and has implemented competency certification. This research was conducted in July-September 2019. The subjects and respondents in this research were all parties related to the implementation of the competency certification program through the LSP P-1 at SMK N 2 Klaten, namely the school principal as the person in charge/board of supervisors, secretaries, treasurers, the certification manager, the chair of the scheme committee, the head of the LSP, the head of the TUK, and the assessors. Data collection techniques in this research used a questionnaire to obtain data regarding the preparation, implementation, and benefits of the program. Data were analyzed using descriptive statistics, namely calculating mean (M), median, mode, and standard deviation (SD), data distribution tables, and category charts in sentences.

RESULTS AND DISCUSSION

Evaluation of Competency Certification Test through The LSP P-1 at SMK N 2 Klaten: Review of the Aspect of Context

The competency certification data from the context aspect was obtained from a questionnaire instrument given to the principal as the person in charge/board of supervisors, secretary, treasurer, certification manager, chair of the scheme committee, chair of the LSP, head of the TUK, and assessors. The indicator contains the objectives of competency certification. The instrument has 12 statements. Descriptive statistical data from the context aspect obtained in this research can be seen in Table 1.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30155

Table 1. Descriptive Statistics of Context Aspect

Mean	Median	Mode	Standard Deviation	Skewness
40.29	40	40	1.92	0.228

Based on Table 1, it can be seen that the mean value in the context aspect is more than the median value, and the median value is the same as the mode value so that the distribution data is positive/right sloping. The size of the skewness is 0.228. For valuation, the value is changed to the ratio number. The skewness ratio is = skewness value/standard skewness error = 0.228/0.285 = 0.8. Therefore, because the skewness ratio is between -2 to +2, the data distribution is normal. The frequency distribution data from the context aspects which are obtained in this research is presented in Table 2.

Table 2. Frequency Distribution in Context Aspect

Interval	Category	F	%
X < 24.00	Very Low	0	0
30 ≥ X ≥ 24.00	Low	0	0
36.00 ≥ X ≥ 30	High	1	2.9
X ≥ 36.00	Very High	33	97.1
Amount		34	100

Based on Table 2, 0 (0%) of respondents are in the category of very low or strongly disagree; 0 (0%) of respondents are in a low category or did not agree; 1 (2.9%) of respondents are in the high category or agree; and 33 (97.1%) of respondents are in the very high category or strongly agree. The value of achieving competency certification quality through LSP P-1 at SMK N 2 Klaten from the context aspect can be seen in Table 3.

Table 3. Value of Achieving Quality Context Aspect

Number of Respondents	Number of Statements	NPK	%	Category
34	12	40.29	83.93	Very High

Based on Table 3, it can be seen that competency certification in terms of context is included in the very high category with a quality achievement score of 40.29, and a percentage of 83.93%. Scales 1 to 4 are applied to assess competency tests in context aspects. Data on the value of quality achievement in the context aspect can be seen in Table 4.

Table 4. Quality Achievement Value in the Context Aspect Indicator

Indicator	Item	Value	Total Value	Category
Policies and Objectives of Competency Certification Test Through LSP P-1	1	4	3.5	High
	2	3.5		
	3	3.5		
	4	3.4		
	5	3.4		
	6	3.3		
	7	3.3		
	8	3.4		
	9	3.5		
	10	3.3		
	11	2.79		
	12	2.58		

Based on Table 4, the policy indicator items and competency certification objectives that have the lowest value of 2.58 are job opportunities for competency certification graduates through LSP P-1 in the international industry. The highest score of 4 is that the purpose of the competency certification test is to gain recognition of the competencies possessed by the assessor. From these results, it is known that the policies and objectives in the competency certification test are in the

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30155

good/high category. Respondents stated strongly agree that competency certification is an effort to recognize prospective workers' competencies. Competency certification is an effort to test students' ability and quality, whether competent or not competent, against the established competency standards.

On the item demands for job opportunities for graduates of LSP P-1 competency certification in the international industry, the item that has the lowest quality value is 2.58. This means that the suitability of competency certification with students' employment opportunities through LSP P-1 on an international scale is still very low. In addition, according to the respondents, the competency certification cannot yet reflect students' competence to enter the international scale industry. The employment opportunities of LSP P-1 graduates are still only in the local scale industry, even for the national scale, it is still low. The suitability of the competency certification test through LSP P-1 at SMK N 2 Klaten in terms of the context of the policy aspects and objectives of competency certification has a value of achieving quality indicators of 3.5.

According to Yusuf (2008, p. 14), context evaluation can help plan decisions, determine the needs to be achieved by the program, as well as formulate program goals. Further, Stufflebeam and Zhang (2017, p. 23) state that context evaluation produces information about environmental dynamics which are beneficial for program implementation. The results show that competency certification is very much in line with the policy and also competency certification objectives. However, there is still a need to adjust between competency certification and job opportunities for LSP P-1 graduates. Based on the results of the study in terms of the context, the competency certification test is an attempt in order to recognize the competencies of prospective workers. Competency certification is developed based on the Indonesian National Standard of Working Competence or known as *Standar Kompetensi Kerja Nasional Indonesia* (SKKNI) and also the business world and industrial world or *Dunia Usaha-Dunia Industri* (DUDI) development. The output of competency certification is adjusted to the needs of this DUDI in order to increase the opportunities for employment.

Evaluation of Competency Certification Test through the LSP P-1 at SMK N 2 Klaten: Review of the Aspect of Input

This is in line with the vocational high school's objectives, and the purpose of work competency certification data on the competency certification component from the input aspect was obtained from the instrument in the form of a questionnaire. Respondents are all parties that are involved in the implementation of the LSP P-1, consisting of the principal as the person in charge/ board of supervisors, secretaries, treasurers, certification managers, chair of the scheme committee, chair of the LSP, head of the TUK, and also assessors. The indicators contained in the input aspect are the Assessor, the Competency Test Material/Test Equipment Material, the Competency Test Site, Facilities, and Infrastructure. Data on this component were obtained from the results of the questionnaire that is given to 71 respondents. The questionnaire has 26 statements. Descriptive statistical data from the input aspects which are obtained in this research is clearly presented in Table 5.

Table 5. Descriptive Statistics of Input Aspect

Mean	Median	Mode	Standard Deviation	Skewness
92.375	92.5	90	3.92	0.439

Table 5 shows that the average value on the input aspect is 92.375; the middle value of 92.5; the most value obtained is 90. It is clear that the data has a standard deviation of 3.92; and a skewness value of 0.439. Based on Table 5, the mean value is less than the median and higher than the mode. The distribution data is positive/right sloping (positive skewness). The size of the skewness is 0.439. For evaluation, the value is changed to the ratio number. Skewness ratio = skewness value/standard skewness error = 0.439/0.285 = 1.5. Therefore, because the skewness ratio is between -2 to 2, then the data distribution is normal. Frequency distribution data from the input aspects obtained in this research can be seen in Table 6.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30155

Table 6. Frequency Distribution in Input Aspect

Interval	Category	F	%
X < 52.00	Very Low	0	0
65 ≥ X ≥ 52.00	Low	0	0
78.00 ≥ X ≥ 65	High	0	0
X ≥ 78.00	Very High	34	100
Amount		34	100

Based on Table 6, 0 (0%) of respondents are in the category of very low or strongly disagree; 0 (0%) of respondents are in a low category or did not agree; 0 (0%) of respondents are in the high category or agreed; and 34 (100%) respondents are in the very high category or strongly agree. The value of achieving quality from competency certification in SMK N 2 Klaten from the input aspect can be seen in Table 7.

Table 7. Value of Achieving Quality Input Aspect

Number of Respondents	Number of Statements	NPK	%	Category
34	26	92.3	88.82	Very High

Based on Table 7, the component of competency certification through LSP P-1 in SMK N 2 Klaten from the input aspect is included in the very high category with a quality achievement score of 92.3 with a percentage of 88.82%. Achievement of the quality of input aspects is assessed on a scale of 1 to 4. Data on the value of quality achievement in input aspects can be seen in Table 8.

Table 8. Quality Achievement Value in the Input Aspect Indicator

Indicator	Item	Value	Total Value	Category
Assessors	1	4	3.31	High
	2	3.37		
	3	3.45		
	4	3.2		
	5	3		
	6	3		
	7	3		
Assessment Tool	8	3.6	3.6	Very High
	9	4		
	10	4		
	11	4		
	12	3.7		
Competency Test Place	13	4	4	Very High
	14	3.8		
	15	4		
	16	4		
	17	4		
	18	4		
	19	4		
	20	3.8		
Facilities and Infrastructure	21	4	3.43	High
	22	3		
	23	3		
	24	4		
	25	4		
	26	3.8		

Based on Table 8, the items in the indicator criteria for assessors with the lowest quality are 3.2, that is, assessors have three times developed, planned, and implemented assessment tools. According to respondents, the importance of assessor quality in competency certification makes as-

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30155

sessor criteria must be maintained at a minimum. The item which has the highest quality value of the assessor indicator is 4. The suitability of the competency certification test through the LSP P-1 at SMK N 2 Klaten from the assessor's input aspect has a value of achieving indicator quality of 3.31. This means that the competency assessor certification test has criteria that are following the requirements. This follows the requirements for implementing competency certification so that the competency certification assessor can provide an assessment correctly.

In the assessment instrument indicators, the achievement value of quality items regarding the assessment equipment is prepared by the assessor team, and the competency assessment tool is updated and developed periodically or according to their respective needs to get a score of 4. The suitability of the assessment kit in competency certification in SMK N 2 Klaten, that is, with an achievement value of item quality of 3.6, means that in the completeness of the assessment tools in the category are very appropriate. This means that the assessment tools are very good. However, according to respondents, there were still too many assessment documents that had to be prepared to make it less than optimal in preparation.

In the indicators of competency test facilities and infrastructure, the value of the quality of the items concerning TUK following the scope of the certification scheme referred and verified TUK each obtained a score of 4 and 3.8. The completeness of the competency test site, as well as facilities and infrastructure in the competency certification test that is with a quality achievement score of 4 and the achievement value of the quality of facility and infrastructure indicator points, is 3.43, meaning that the completeness of the competency test site and facilities and infrastructure is very good. This means that the competency test is considered very feasible, but according to respondents, in this case, it is necessary to improve the indicators of procedures and equipment (number, quality of tools, materials) for competency testing.

According to Kaufman and Thomas (2009, pp. 116–117), evaluation of inputs is used to identify what is needed to determine the purpose of the evaluation being carried out. The input aspect also helps to determine the procedures and design for implementing the program. The research results on the input aspect indicate the need for improvement in the indicators of the suitability of the assessors' criteria with the requirements so that it is necessary to train all prospective assessors.

Evaluation of Competency Certification Test through the LSP P-1 at SMK N 2 Klaten: Review of the Aspect of Process

Data on the competency certification component of the process aspects were obtained from instruments in the form of questionnaires. Respondents are all parties involved in the implementation of the LSP P-1, consisting of the principal as the person in charge/board of supervisors, secretary, treasurer, certification manager, scheme committee chair, LSP chair, TUK head, and assessors. The indicators contained in this aspect of the process are Competency Certification Test Preparation, Competency Certification Test Time, Competency Certification Test Procedure, Assessment System. Data on this component were obtained from the results of the questionnaire given to 71 respondents. The questionnaire has 20 statements. Descriptive statistical data from the process aspects obtained in this research can be seen in Table 9.

Table 9. Descriptive Statistics of Process Aspect

Mean	Median	Mode	Standard Deviation	Skewness
67.33	67.5	71	3.7	0.177

Based on Table 9, it can be seen that the mean price on the aspect of the process is 67.33; the middle value of 67.5; the most value obtained is 71; the data has a standard deviation of 3.7; and skewness value of 0.177. Based on Table 9, the mean value is less than the median and higher than the mode, then the distribution data is positive/italicized (positive skewness). The size of the skewness is 0.177. For valuation, the value is changed to the ratio number. Skewness ratio is = skewness value/standard skewness error = 0.177/0.285 = 0.62. Because the skewness ratio is between -2 to = 2, the data distribution is normal. Data on the frequency distribution of aspects of the process obtained in this research can be seen in Table 10.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30155

Table 10. Frequency Distribution in Process Aspect

Interval	Category	F	%
X < 38.00	Very Low	0	0
47.5 ≥ X ≥ 38.00	Low	0	0
57.00 ≥ X ≥ 47.5	High	0	0
X ≥ 57.00	Very High	34	100
Amount		34	100

Based on Table 10, 0 (0%) of respondents are in the category of very low or strongly disagree; 0 (0%) of respondents are in a low category or did not agree; 0 (0%) of respondents are in the high category or agreed; and 34 (100%) respondents are in the very high category or strongly agree. The value of achieving quality from competency certification in SMK N 2 Klaten from the aspect of the process can be seen in Table 11.

Table 11. Value of Achieving Quality Process Aspect

Number of Respondents	Number of Statements	NPK	%	Category
34	20	67.33	88.59	Very High

Based on Table 11, it can be seen that the component of competency certification test through LSP P-1 in SMK N 2 Klaten from the aspect of the process is included in the very high category with a quality achievement score of 67.33 with a percentage of 88.59%. Achievement of the quality of input aspects is assessed on a scale of 1 to 4. Data on the value of quality achievement in the input aspect can be seen in Table 12.

Table 12. Quality Achievement Value in the Process Aspect Indicator

Indicator	Item	Value	Total Value	Category
Implementation of Competency Certification Test	1	4	4	Very High
Competency Certification Test Preparation	2	3.3	3.47	High
	3	3.4		
	4	3.2		
	5	3		
	6	3		
	7	3		
	8	3.5		
	9	3.5		
	10	3.7		
	11	4		
	12	4		
	13	3.8		
	14	4		
	15	3.8		
Competency Certification Test Procedure	16	3.7	3.85	Very High
	20	4		
	18	4		
	19	3.7		
Assessment System	17	3.4	3.4	High

Based on Table 12, the items that have the lowest quality value of the competency certification preparation indicators are items 5, 6, and 7 with a value of 3 that in the implementation of competency certification is well prepared but in terms of the test material and test, the material is still lacking, so it needs to be added to maximum results. The competency certification test preparation through LSP P-1 from the aspect of the process regarding the preparation in the competency certification test has the achievement value of the indicator quality of 3.47. This means that competency certification preparation is suitable.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30155

The time of implementation in competency certification is to use the achievement value of the indicator quality of 4. The research results on the process aspects show that the implementation of competency certification through LSP P-1 is very high, meaning that the competency certification has been well scheduled. The suitability of the procedure in competency certification has a value of achieving the quality of indicator items of 3.85. This means that the implementation procedures for competency certification are very appropriate. The assessment system in competency certification has a value of achieving the quality of indicator indicators of 3.4. This means that the assessment system is very good, by the guidelines, and the assessment system is honest and transparent.

According to Kaufman and Thomas (2009, pp. 116–117), process evaluation is specifically used to detect, identify the strengths and weaknesses of a program that occurs during the implementation of a program. Process evaluation is used as a record of the real implementation of a program. The results showed the implementation of competency certification from the aspect of the process in the excellent category, with several indicators that must be considered, namely in preparing materials and preparing competency test materials. Thus, it needs additional facilities and infrastructure for the implementation of competency certification and preparation of test materials and test materials must be adjusted to the package of questions.

Evaluation of Competency Certification Test through the LSP P-1 atSMK N 2 Klaten: Review of the Aspect of Product

Data on the competency certification component from the product aspect were obtained from the instrument in the form of a questionnaire. Respondents are all parties involved in implementing the LSP P-1 consisting of the principal as the person in charge/board of supervisors, secretaries, treasurers, certification managers, chair of the scheme committee, chair of the LSP, head of the TUK, and assessors. The indicators contained in the product aspects are the Results of Competency Certification Products and Competency Certification Certificates. Data on this component were obtained from the results of the questionnaire given to 71 respondents. The questionnaire has 11 statements. Descriptive statistical data from the product aspects obtained in this research can be seen in Table 13.

Table 13. Descriptive Statistics of Product Aspect

Mean	Median	Mode	Standard Deviation	Skewness
34.5	34.5	36	2.28	0.275

Based on Table 13, the mean value on the product aspect is the same as the median value and is smaller than the mode value, then the distribution data is positive/tilted to the right (positive skewness). The size of the skewness is 0.275. For valuation, the value is changed to the ratio number. Skewness ratio = skewness value/standard skewness error = 0.275/0.285 = 0.9. Because the skewness ratio is between -2 to +2, the data distribution is normal. Frequency distribution data from product aspects obtained in this research can be seen in Table 14.

Table 14. Frequency Distribution in Process Aspect

Interval	Category	F	%
$X < 22.00$	Very Low	0	0
$27.5 \geq X \geq 22.00$	Low	0	0
$33.00 \geq X \geq 27.5$	High	8	23.5
$X \geq 33.00$	Very High	26	76.5
Amount		34	100

Based on Table 14, 0 (0%) of respondents are in the category of very low or strongly disagree; 0 (0%) of respondents are in a low category or did not agree; 8 (23.5%) respondents are in the high category or agreed, and 26 (76.5%) respondents are in the very high category or strongly agree. The achievement value of competency certification in SMK N 2 Klaten from the product aspect can be seen in Table 15.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30155

Table 15. Value of Achieving Quality Product Aspect

Number of Respondents	Number of Statements	NPK	%	Category
34	11	34.5	78.4	High

Based on Table 15, it can be seen that the component of competency certification through LSP P-1 in SMK N 2 Klaten in terms of product aspects is included in the high category with a quality achievement score of 34.5 with a percentage of 78.4%. Table 16 shows the acquisition of the quality value of product aspects with a scale of 4.

Table 16. Quality Achievement Value in the Process Aspect Indicator

Indicator	Item	Value	Total Value	Category
Competency Certification Test Results	1	4	3.6	Very High
	2	3.3		
	3	3.4		
Competency Certification Test Products	4	3.2	2.5	Low
	5	1.9		
Competency Certification Test Certificates	6	3	3	High
	7	3		
	8	3.6		
	9	1.6		
	10	4		
	11	3.6		

Based on Table 16, the competency test document indicators that have the lowest quality value are from the psychomotor aspects that are equal to 3.3. The achievement of the competency certification test through LSP P-1 in Klaten Regency in terms of product aspects regarding the results in competency certification has a value of achieving the quality indicator indicators of 3.6. This means that competent assessments are proven by the value of competency certification results in the excellent category. However, the psychomotor aspects need to be improved to be in accordance with the competency qualifications.

The item from the lowest competency certificate indicator is point 9 regarding the issuance of certificates with a value of 1.6. This means that respondents disagree with the issuance of certificates. The achievement of the competency certification certificate is with the achievement value of the indicator quality of 3. This means that the recognition of the business world and the industrial world of the competency certificate is still low, so cooperation with the business world and industry is needed so that the competency certificate is truly recognized.

According to Wirawan (2011, pp. 92–94), product evaluation seeks to answer whether the program was successful. The time of implementation when the program is complete. The results showed that from the aspect of product competency, certification tests must be considered in psychomotor because it greatly affects assessment competence assessment. Product reliability must be adjusted to the needs and demands of the product because the certification of quality/ideal competence is expected to be able to produce competent candidates for the workforce. Other aspects of the product that must be considered are competency certificates. Ideally, competency certificates are issued no later than two weeks after the implementation of competency certification but based on the testimony of all respondents, it is more than the specified time.

CONCLUSION

Based on the problem, research objectives, results of analysis and discussion that have been presented, it can be concluded that (1) the implementation of competency certification through LSP P-1 in SMK N 2 Klaten in terms of the suitability of context aspects is included in the very appropriate category (83.93%), i.e., relevant to the policies and objectives of competency certification. (2) The implementation of competency certification through LSP P-1 at SMK N 2 Klaten in terms of suitability of input aspects is included in the very appropriate category (88.82%), which meets

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30155

the criteria of assessors, completeness of assessment equipment, place of competency test, and test infrastructure competence. (3) The implementation of competency certification through LSP P-1 in SMK N 2 Klaten is reviewed from the aspect of the process included in the very appropriate category (88.59%), namely the suitability of the implementation procedures, time allocation, preparation, and evaluation system in competency certification. (4) The implementation of competency certification through LSP P-1 at SMK N 2 Klaten in terms of achievement of product aspects is included in the very high category (78.4%), namely the achievement of competency certification products and competency certificates.

Implications in this research are as follows. (1) The results of the study indicate that in the implementation of competency certification related to policies and objectives are very appropriate, but from some of these indicators, the implementation of competency certification does not yet reflect the competence of students to engage in national and international scale industries, employment opportunities for graduates more in the local industry, even on a national scale is still low. Thus, cooperation is needed with the industry and the need for competency standards/criteria in accordance with the industry, both local, national, and international scale. (2) The results of the study indicate that the implementation of competency certification in terms of input is already very appropriate, but from some of these indicators, it is still not optimal, namely regarding the suitability of assessors' criteria and requirements. Thus, it needs training for prospective assessors. (3) The results of the study indicate that in the implementation of competency certification in terms of the implementation process, there are still some shortcomings, namely the limitations of infrastructure and the number of equipment and materials that are less than the number of test participants, so the need for additional infrastructure is quite urgent. (4) The results of the study show that in the implementation of competency certification in terms of products, it is shown that the psychomotor aspects of the test participants are lower than other aspects, this is because there are still many test participants who have not mastered the theories related to competency certification. Besides, in terms of products, the implementation of competency certification through LSP P-1 is still constrained due to funding issues. Therefore, comprehensive guidance is needed for students, and additional funding is needed.

REFERENCES

BNSP Regulation No. 1/BNSP/III/2014 on the Guidelines for Conformity Assessment - General Requirement for Professional Certification Agency, (2014).

BNSP Regulation No. 10/BNSP.303/XI/2013 on the General Requirement Guidelines for Assessors, Master Assessors, and Lead Assessors, (2013).

Colardyn, D. (2009). The certification of competencies. In R. Maclean & D. Wilson (Eds.), *International handbook of education for the changing world of work: Bridging academic and vocational learning* (pp. 2777–2792). Springer.

Dobson, G. (2003). *A guide to writing competency-based training materials.* . Commonwealth of Australia - National Volunteer Skills Centre.

Kaufman, R., & Thomas, S. (2009). *Evaluation without fear*. New Viewpoints.

Kuswana, W. S. (2013). *Dasar-dasar pendidikan vokasi dan kejuruan*. Alfabeta.

Ministry of Education and Culture. (2017). *327 SMK sudah jadi lembaga sertifikasi profesi*. LPPKS Ministry of Education and Culture of Republic of Indonesia. http://lppks.kemdikbud.go.id/id/kabar/327-smk-sudah-jadi-lembaga-sertifikasi-profesi

Rizkiyah, N. F., Mariana, R. R., & Soekopitojo, S. (2018). Sertifikasi asesor kompetensi guru produktif program keahlian Tata Boga dalam pelaksanaan uji sertifikasi kompetensi. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, *3*(6), 708–714. https://doi.org/10.17977/jptpp.v3i6.11110

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30155

Rodin, R. (2015). Sertifikasi uji kompetensi sebagai upaya peningkatan profesionalitas pustakawan. *Jurnal Kepustakawanan Dan Dokumentasi Informasi*, *14*(2), 15–24. https://journal.unhas.ac.id/index.php/jupiter/article/view/33

Stufflebeam, D. L., & Zhang, G. (2017). *The CIPP evaluation model: How to evaluate for improvement and accountability*. The Guilford Press.

Suharto, S. (2015). Evaluasi pelaksanaan kegiatan uji sertifikasi kompetensi keahlian administrasi perkantoran. *Prosiding Seminar Nasional Pendidikan Administrasi Perkantoran*, 37–47. https://jurnal.uns.ac.id/snpap/article/view/26528

Tissot, P. (2004). *The terminology of vocational training policy: A multilingual glossary for an enlarged Europe*. Office for Official Publications of the European Communities.

Wirawan, W. (2011). *Evaluasi teori model standar aplikasi dan profesi: Contoh aplikasi evaluasi program: Pengembangan sumber daya manusia, program nasional pemberdayaan masyarakat (PNPM) mandiri perdesaan, kurikulum, perpustakaan, dan buku teks*. Rajawali Pers.

Yusuf, A. R., & Mukhadis, A. (2018). Model pengembangan profesionalitas guru sesuai tuntutan revitalisasi pendidikan vokasi di Indonesia. *Lectura: Jurnal Pendidikan*, *9*(2), 130–139. https://doi.org/10.31849/lectura.v9i2.1613

Yusuf, F. T. (2008). *Evaluasi program dan instrumen evaluasi untuk program pendidikan dan penelitian*. Rineka Cipta.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

Jurnal Pendidikan Vokasi
Volume 10, No. 1, 2020 (56-68)
Online: http://journal.uny.ac.id/index.php/jpv

THE READINESS OF TEACHER CANDIDATES FOR VOCATIONAL HIGH SCHOOL IN THE 4TH INDUSTRIAL ERA VIEWED FROM TEACHING SKILL AND CAPABILITY IN TECHNOLOGY

Susanti[1], Harti[1], Vivi Pratiwi[1]*
[1]Universitas Negeri Surabaya
Jl. Ketintang No.2, Ketintang, Gayungan, Kota Surabaya, Jawa Timur 60231, Indonesia

Abstract

This study aims to evaluate the readiness of prospective teachers for Vocational High Schools in dealing with the world of work in the 4th industrial era when viewed from teaching skills and technological mastery abilities. This study is evaluative research with a quantitative descriptive approach. The population in this study consisted of 1,725 students at Universitas Negeri Surabaya. A total of 996 students were used as research samples by using a simple purposive sampling technique. The results show that the average readiness in the aspects of teaching skills as much as 81.78% of students said they are ready, while the average readiness in the aspect of mastering technology is 88.59% so that it can be stated that students as prospective VHS teachers are very ready to face the world of work. Vocational teacher candidates already have good teaching skills because they are equipped with various theories and practices directly to the school, from skills to close the open lesson, even drafting learning lessons so that they have the experience they are prepared to use in the world of work. In the ability to master technology, vocational teacher candidates already have a good readiness to use technology in learning, such as accessing various Microsoft programs.

Keywords*: work-readiness, teaching skills, technological mastery*

How to cite: Susanti, S., Harti, H., & Pratiwi, V. (2020). The readiness of teacher candidates for vocational high school in the 4th industrial era viewed from teaching skill and capability in technology. *Jurnal Pendidikan Vokasi*, *10*(1), 56-68. doi:https://doi.org/10.21831/jpv.v10i1.28057

***Corresponding Author:** Vivi Pratiwi by434178@gmail.com
Department of Accounting Education, Faculty of Economics, Universitas Negeri Surabaya
Jl. Ketintang No. 2, Ketintang, Gayungan, Kota Surabaya, Jawa Timur 60231, Indonesia

https://doi.org/10.21831/jpv.v10i1.28057

INTRODUCTION

Nowadays, the world began to enter the era of the 4th industrial revolution as the impact of the advances in science and technology brought. The 4th industrial revolution era is a new era in the development of the world today. This era is closely related to the integration of automation technology and cyber technology for data exchange in manufacturing technology. The 4th Industrial Revolution era applied the concept of automation carried out by machines without requiring human labor in its application or use. This era refers to current and future developments regarding the use and use of technology that is capable of changing the workplace (Beraza, 2018, p. 215).

Although the impact of the development of the industrial revolution era on employment opportunities for graduates has not been very visible, there is a possibility that this 4th industrial era will create new jobs and unemployment in a relatively equal amount (Teng et al., 2019, p. 2). All jobs will experience the impact of this industrial revolution, which will certainly affect new graduates in dealing with the world of work (Chui et al., 2016, p. 58). As a result, as many as 75-375 million workers switched professions, and machines replaced as many as 1.8 million jobs. Therefore, State Higher Education or *Perguruan Tinggi Negeri* (PTN) and Private Higher Education or *Perguruan Tinggi Swasta* (PTS) are required to be able to produce professional graduates who are ready to face this 4th industrial era.

Universitas Negeri Surabaya (UNESA) is one of the PTN in Indonesia that organizes educational programs and non-educational programs that have more than 25,000 students. UNESA is an institution based on LPTK (Educational Workforce Education Institutions) so that its main task is to produce educational personnel for preschool education, basic education, and secondary education. UNESA students as candidates for professional education in the era of the 4th industrial revolution must certainly be able to understand and develop according to the needs of the workforce today. This is because they will play an important role in the success of learning at various levels of education that will affect the quality of human resources in Indonesia. Professional education personnel has several criteria that must be mastered, including teaching skills (Ambarawati, 2016, p. 83; Hidayat et al., 2016, p. 249) and good technological mastery skills (Hidayat et al., 2016, p. 251).

Teaching skills really need to be owned by teachers to transfer knowledge, skills, attitudes, and values to students in the learning process. There are seven teaching skills that must be possessed by teachers, namely: Skills to open lessons, Skills to explain, Skills to ask questions, Skills to strengthen, Skills to hold variations, Skills to close lessons, and Skill in preparing Learning Implementation Plans or RPP (Ambarawati, 2016, p. 84; Huda, 2013, p. 58; Zenda, 2017, p. 175). Educational students interested in and understand the teaching profession will give greater attention to understanding and learning about the teaching profession, namely work in education and teaching. Furthermore, these students will carry out activities to foster and improve teaching skills towards professional teacher competencies.

Technology mastery skills can be interpreted as the ability to use applications or software to search, provide, change, and control information creatively to produce, evaluate, and analyze information into other forms using a variety of tools and digital media (Voogt et al., 2013, p. 405). According to Saputra and Purnama (2012, p. 61), teachers as educators will always be required to be innovative creative in finding learning breakthroughs that are able to combine text, images, audio, music, animation, and video in a unity that supports one another in order to achieve learning objectives and are able to arouse pleasure during the learning process. In accounting learning, the use of computer applications during the learning process was able to improve students' ability to use computers and influence the level of salary earned (Suttipun, 2014, p. 145). Under these conditions, students as prospective workers need to be equipped with soft skills in the form of technological mastery abilities that will affect student work readiness in the 4th industrial era (Teng et al., 2019, p. 12).

Based on these conditions, UNESA must be able to produce quality educational staff in accordance with the needs of the world of work in the 4th industrial era. The Department of Economic Education is one of the departments at UNESA that produces educational staff at the level of vocational secondary education or commonly known as Vocational High School (VHS). Based on an

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28057

initial survey conducted at Department of Economic Education graduates at UNESA in 2019, information was obtained that as much as 41.42% of 350 graduates worked as teachers, 30% worked as private employees, 5.71% worked as entrepreneurs, 4.28% worked as banks, and the rest work in other fields. This shows that the interest of graduates with the aim of PTN is appropriate, namely, to produce educational staff (teachers). Then from the results of the initial interviews with the graduates, it was found that to be able to get a job now needed the ability to master technology such as the ability to operate computers and the internet to support the desired profession. In addition, teaching skills are also very necessary, considering that most graduates of the Department of Economic Education in UNESA work as teachers according to their fields.

Based on these conditions, an evaluation of students' readiness as prospective college graduates is needed to provide an overview of the conditions of vocational teacher candidates in facing the world of work in the 4th industrial era. Work readiness can be seen as a process and purpose that involves the development of one's work related to attitudes, values, knowledge, and skills (Yustina & Sukardi, 2014, p. 183). Work readiness refers to the degree to which people have the ability and willingness to complete certain tasks (Utami & Hudaniah, 2013, p. 44). In order to work effectively and efficiently, as well as develop expertise and skills, students as prospective job seekers must have high stamina, master their expertise, and the basics of science and technology, have a high work ethic, and be able to communicate in accordance with the demands his job, and has the ability to develop themselves (Hidayat et al., 2016, p. 247). According to Suttipun (2014, p. 139), students' readiness in facing the world of work can be seen from their capabilities, knowledge, and competence in building relationships. According to Hanani and Sukirno (2016, p. 38), students' readiness in facing the world of work can be seen from ethical competency, knowledge competency, capability competency, respect about human rights and values, and competency analysis. Therefore, teacher candidates' readiness to face the world of work can be seen from their teaching skills and technological mastery abilities. An evaluation of the work readiness is needed so that the information obtained from the results of this study can be used as input in improving the learning process for educational institutions and also as an illustration of what competencies or expertise need to be prepared by graduates in this case as prospective teachers in dealing with the world of work.

Based on the background above, vocational teacher candidates' readiness needs to be evaluated to find out the quality of teaching skills and the ability to master technology in facing the demands of the world of work in the 4th industrial revolution era. Therefore, this study aims to illustrate vocational teacher candidates' readiness to face the workforce in the 4th industrial era when viewed from teaching skills and the ability to master technology. The results of this study are expected to be used as evaluation material to improve the quality of learning in PTN/PTS so as to improve the quality of graduates who will later become professional education personnel at various levels of education. In addition, the results of this study can also be used to find solutions and actions that can improve the competitiveness of PTN/PTS graduates to face the world of work.

RESEARCH METHOD

This research is an evaluative study using a quantitative descriptive approach. Evaluative research is research conducted to gather useful information about the object of evaluation understudy and then is compared and assessed with certain indicators. The population of this study was 1,725 students majoring in Economic Education at Universitas Negeri Surabaya (UNESA). The sample used was 996 students who were determined using a simple purposive sampling technique. The sample criteria used are students majoring in Economic Education 4-8 semester, assuming students have obtained educational courses and shortly will face the world of work to consider the sample relevant to the research objectives.

Data collection was carried out by distributing questionnaires to student samples to produce primary data from research subjects. Based on various theories and previous research, this study uses research indicators regarding work readiness, namely teaching skills and the ability to master technology. Data obtained from the results of student surveys in the form of quantitative data so analyzed descriptively quantitative with percentage techniques. Quantitative data were obtained using a Likert scale with a score of 1-4, with the criteria not ready until very ready.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28057

RESULTS AND DISCUSSION

Based on the results of the distribution of questionnaires, the readiness of teacher candidates for vocational high schools in dealing with the world of work in the 4th industrial era if seen from teaching skills and the ability to master technology can be explained as follows.

Teaching Skills for Prospective Teachers at Vocational High Schools (VHS)

Based on the results of research conducted to students majoring in Economic Education at UNESA, it is found information about the readiness of teacher candidates of Vocational High Schools (VHS) in dealing with the world of work seen from teaching skills, which are divided into eight aspects. Each aspect is elaborated as follows.

Aspect of Opening Lesson Skills

In the aspect of skills in opening the lesson, the readiness of vocational teacher candidates can be seen in Figure 1. Based on Figure 1, that the indicators of skills attract students' attention when opening learning indicate that 89.6% of students of the Department of Economic Education, Faculty of Economics, UNESA as future teacher candidates already have the skills to attract good students when opening learning. Students feel they already have good confidence in terms of appearance and attitude as a teacher that they get from learning in the course of the Management and Learning Program, so they feel ready to attract the attention of students.

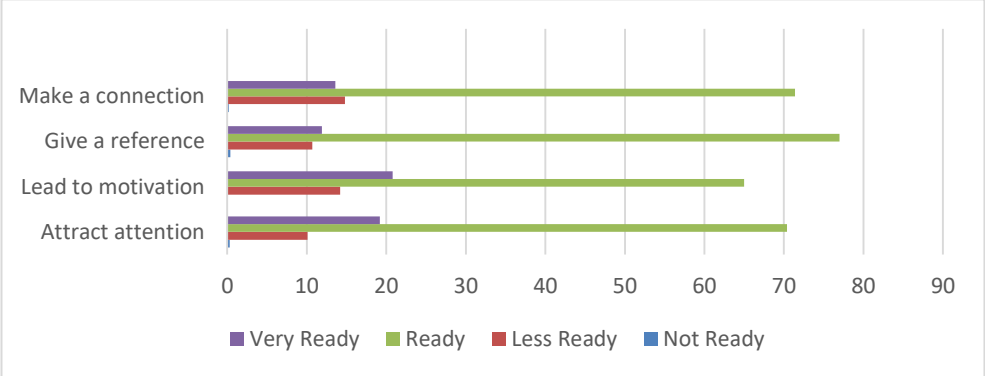


Figure 1. Skills for Opening Lessons

On the indicator of lead motivation, skills indicate that 86.3% of prospective VHS teachers already have the skills to cause good motivation when opening learning. Students need these skills as prospective educators to make students who will be given the material to be interested in the material to be learned by using various forms of learning motivation.

Then, the indicator of giving reference skills indicates that as many as 88.9% of teacher candidates already have the skills to provide a good reference when opening learning. Giving a reference in question is to give instructions on what activities will be carried out in learning. Thus, learning will be directed and effective in achieving learning objectives.

The indicator of making connections skills indicates that as many as 85% of prospective vocational high school teachers already have the skills to make good connections when opening learning. By having these skills, students will be able to open learning to be meaningful because it can link the materials that are learned by students, so that the materials given will last long in the students' memories. This skill will undoubtedly add value to students as prospective quality educators.

Aspect of Explaining Skills

In the aspect of explaining skills, the readiness of vocational teacher candidates can be seen in Figure 2. Based on Figure 2, there are 74.3% of students of the Department of Economic Education, Faculty of Economics of UNESA, as future teacher candidates in vocational high school,

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28057

who already have a good readiness in the use of appropriate learning methods. As future teacher candidates, students already have good knowledge on various methods that can be used in implementing learning.

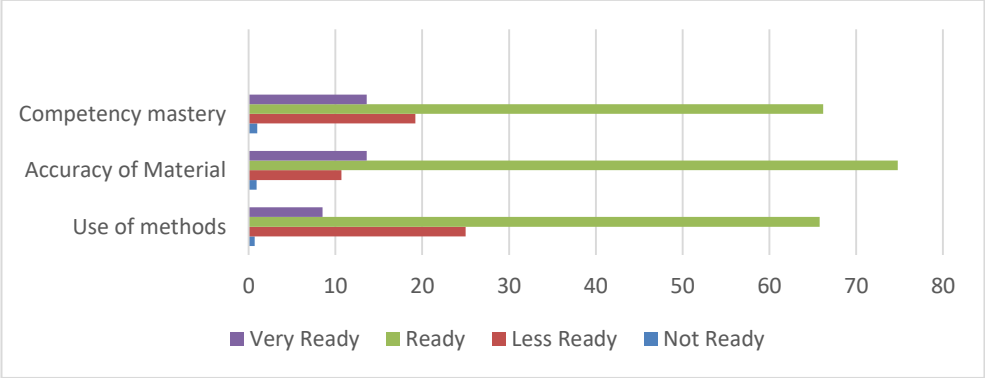


Figure 2. Explaining Skills

On the indicator of the accuracy of the material, it is indicated that 88.4% of prospective VHS teachers already have the skills to cause good motivation when opening learning. VHS teacher candidates already have a good readiness to select material used when explaining in learning activities accurately. Students have experience learning about materials related to subjects that will be taught when becoming a teacher later. Students are equipped with knowledge and skills according to their area of expertise in each study program.

Furthermore, the indicators of mastery of competence indicate that as many as 79.8% of VHS teacher candidates already have good competency mastery readiness that they will teach later when entering the workforce. Good mastery of competencies will make it easier for students to adapt to the teaching world in the 21st century of learning today.

Aspect of Asking Skills

In the aspect of questioning skills, the readiness of vocational teacher candidates can be seen in Figure 3. Based on Figure 3, the clear and concise questioning skill indicator indicates that 76.2% of vocational teacher candidates already have the skills to express questions clearly and concisely when conducting questions and answer learning activities. This skill is also needed when later making evaluation questions at the end of learning.

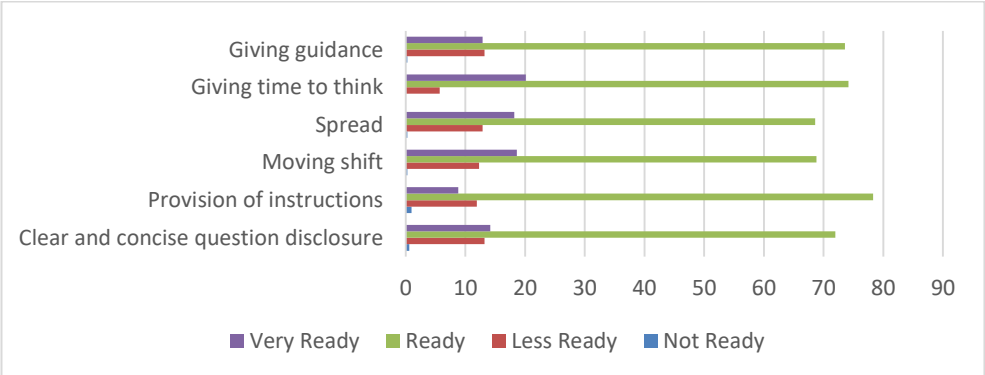


Figure 3. Asking Skills

Then, on the indicator of the provision of instruction skills, it is indicated that as many as 87.1% of vocational teacher candidates already have good reference skills when conducting a question and answer with students. The reference is given to give students a clear picture and boundary of the teacher's questions and answers and vice versa.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28057

On the indicator of moving shift skills, it is indicated that 87.4% of vocational teacher candidates already have shifting skills when conducting questions and answers (Q&A) sessions in learning. This shifting of turns is necessary so that the interaction between the teacher and students is not only centered on one individual student, but is comprehensive on each individual inside the class.

In the indicator of the spread of questioning skills, it shows that as many as 86.8% of prospective vocational teacher teachers already have good dissemination skills when conducting Q&A with students. Furthermore, the indicator of giving time to think skills when doing questions and answers indicates that as many as 84.3% of vocational teacher candidates already have good accuracy in giving students time to think when giving questions to students. Meanwhile, the indicator of giving guidance skills indicate that as many as 86.1% of vocational teacher candidates already have good skills in giving demands to students to find the right and correct answers to questions raised by teachers to their students.

Aspect of Strengthening Skills

In the aspect of strengthening skills, the readiness of vocational teacher candidates can be seen in Figure 4. Based on Figure 4, it is presented that the indicator of strengthening certain students' skills when learning indicates that as many as 87.5% of vocational teacher candidates already have good skills in providing reinforcement to certain students. This reinforcement is given to students who can do a good job in the form of praise or reinforcement by reprimand when students make mistakes. Thus, students will be ready to become teachers who are able to control the class.

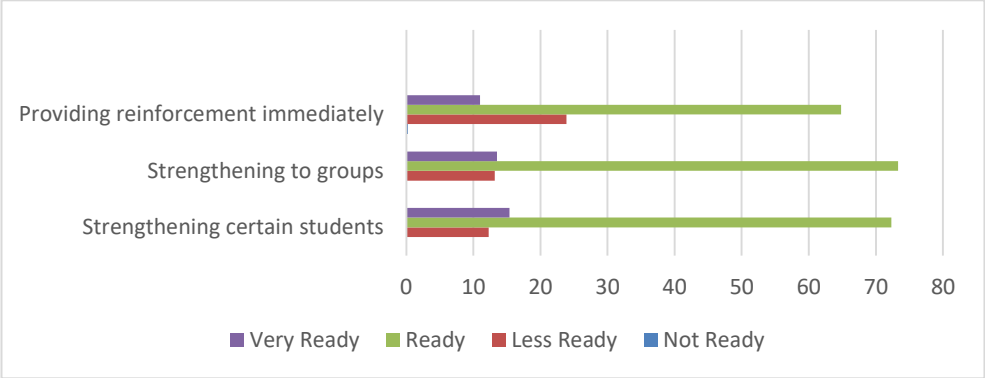


Figure 4. Strengthening Skills

In the indicator of strengthening to group skills, it is indicated that 86.8% of vocational teacher candidates already have good skills in reinforcing to study groups. It will be the provision of students as prospective teachers in guiding the course of learning through cooperative-based learning.

Then, on the indicator of providing reinforcement immediately skills, it is indicated that as many as 75.8% of vocational teacher candidates already have good skills in providing reinforcement immediately. It means that students, as prospective teachers, already feel good punctuality when necessary to strengthen learning.

Aspect of Making Variation Skills

In the aspect of the skills to hold variations, the readiness of vocational teacher candidates can be seen in Figure 5. Based on Figure 5, it can be seen that the indicators of variation in teaching methods skills indicate that as many as 69.4% of vocational teacher candidates already have good skills in providing variations in the way of teaching. Students have been provided with provisions on various models and methods that can be used in learning so that the class becomes lively and enjoyable.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28057

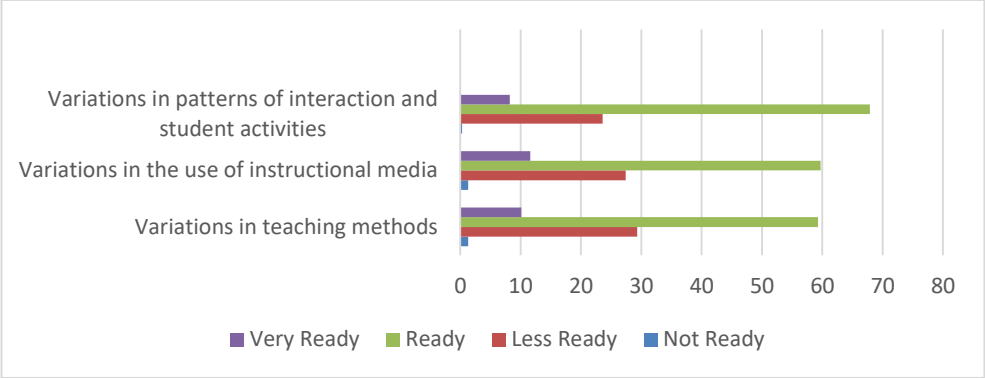


Figure 5. Making Variations Skills

The indicator of variation in the use of instructional media skills indicates that 71.3% of vocational teacher candidates already have good skills in the use of learning media. Students already know various types of media that can be used to facilitate the delivery of material to students later. However, the obstacle faced by many students as prospective teachers is the limited availability of suitable learning media. It is a challenge and also the reason why 28.7% of students feel they are not ready to use media variations in learning.

Then, the indicator of variation in the patterns of interaction and student activities skills indicates that 76.1% of vocational teacher candidates already have good skills when giving variations in patterns of interaction and student activities. It is needed by students, as prospective teachers, so that the learning atmosphere is not boring and saturated so students will be interested in learning.

Aspect of Closing Lessons Skills

In the aspect of closing skills, the readiness of vocational teacher candidates can be seen in Figure 6. Based on Figure 6, it can be seen that the indicator revisiting the mastery of core learning skills indicates that as many as 76.4% of vocational teacher candidates already have good skills in reviewing the mastery of core learning. These skills are needed to be able to summarize what has been learned at the end of learning.

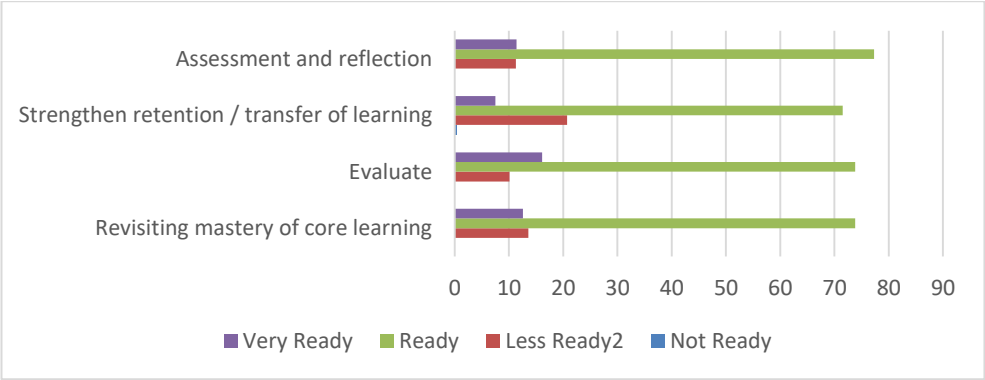


Figure 6. Closing for Lessons Skills

The evaluation skills indicator indicates that as many as 89.8% of vocational teacher candidates already have good evaluation skills at the end of learning. With good evaluation skills, students as prospective teachers will know the learning achievements that have been achieved to determine further learning activities.

The indicator of strengthening retention/transfer of learning skills indicates that as many as 79% of vocational teacher candidates already have good skills in strengthening the retention/ transfer of learning conclusions to students at the end of learning.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28057

Furthermore, the indicator of assessment and reflection skills indicates that as many as 88.7% of vocational teacher candidates already have good skills in assessing and reflecting. It is closely related to the determination of student learning outcomes that must be done by the teacher as a report and evaluation material from the teacher of the learning activities that have been carried out. Students as prospective teachers of the 21st century will also be able to choose the use of evaluation methods that are appropriate for technological developments.

Aspect of Skills in Preparing Learning Implementation Plan (RPP)

In the aspect of skills in preparing the Learning Implementation Plan or *Rencana Pelaksanaan Pembelajaran* (RPP), prospective vocational teacher candidates' readiness can be seen in Figure 7. Based on Figure 7, it can be seen that the indicators of filling the identity column in the preparation skills indicate that as many as 81% of vocational teacher candidates already have good skills in filling the identity column in the preparation of lesson plans.

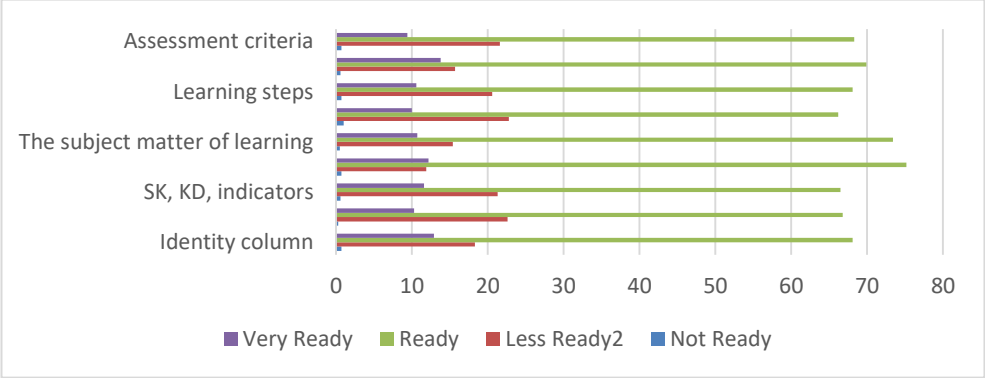


Figure 7. Skills in Developing RPP

Then, the indicator of filling the time allocation in the preparation of the RPP skill indicates that as many as 77.1% of vocational teacher candidates already have good skills in filling the time allocation in preparing the RPP. In the indicators of deciding the competency standard or *Standar Kompetensi* (SK), basic competency or *Kompetensi Dasar* (KD), indicators on the preparation of RPP skills indicate that as many as 78.1% of vocational teacher candidates already have good skills in determining SK, KD, and indicators in preparing the RPP.

In the indicator of determining learning objectives in the preparation of the RPP skills, it is indicated that as many as 87.4% of vocational teacher candidates already have good skills in determining learning objectives in preparing lesson plans. The indicator of determining the subject matter of learning in the preparation of RPP skills indicates that as many as 84.1% of vocational teacher candidates already have good skills in determining the subject matter of learning in the preparation of lesson plans.

The indicator of the selection of learning methods in the preparation of RPP skills indicates that as many as 76.2% of vocational teacher candidates already have good skills in the selection of learning methods in the preparation of lesson plans. The indicator of determining the steps of learning in the preparation of the RPP skills indicates that as many as 78.7% of prospective vocational teachers already have good skills in determining the steps of learning in the preparation of lesson plans.

The indicator of determining the tools/materials/learning resources in the preparation of RPP skills indicates that 83.7% of vocational teacher candidates already have good skills in determining the tools/materials/learning resources in the preparation of lesson plans. The indicator of determining the assessment criteria of learning in the preparation of RPP skills indicates that as many as 77.7% of vocational teacher candidates already have good skills in determining the learning assessment criteria in the preparation of lesson plans.

Based on the results of the study, prospective vocational teachers have good readiness in teaching skills. All teaching competencies are employability skills that must be possessed by pro-

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28057

spective teachers in dealing with the world of work (Verma et al., 2018, p. 122). By having good competency mastery, prospective teachers will be easier to work and better prepared to face the world of work because they have good skills (Lestari & Siswanto, 2015, p. 188).

Graduates' work readiness is now an important criterion for getting a job (in this study as a prospective vocational teacher) and has become increasingly demanded in the development of university graduate skills (Cavanagh et al., 2015, p. 279; Hager & Holland, 2006, p. 67). Prospective teachers are expected to be in the job-ready mode and with a level of employability that can be demonstrated when they drop out of university studies (Clarke, 2018, p. 1924; Prikshat et al., 2019, p. 568).

Technology Mastery of Vocational High School (VHS) Teacher Candidates

Based on the results of research conducted to students majoring in Economic Education at UNESA, the readiness of prospective Vocational High School (VHS) teachers in dealing with the world of work seen from teaching skills which are divided into eight aspects. Each aspect is explained as follows.

Aspect of Technology Use

In the aspect of technology use, the readiness of vocational teacher candidates can be seen in Figure 8. Based on Figure 8, the indicators of the use of technology to looking for learning materials with internet skills indicate that all prospective vocational teachers already have good skills in using technology to search for learning materials on the internet. Students are already familiar with the ease of accessing various information provided on the internet in everyday life.

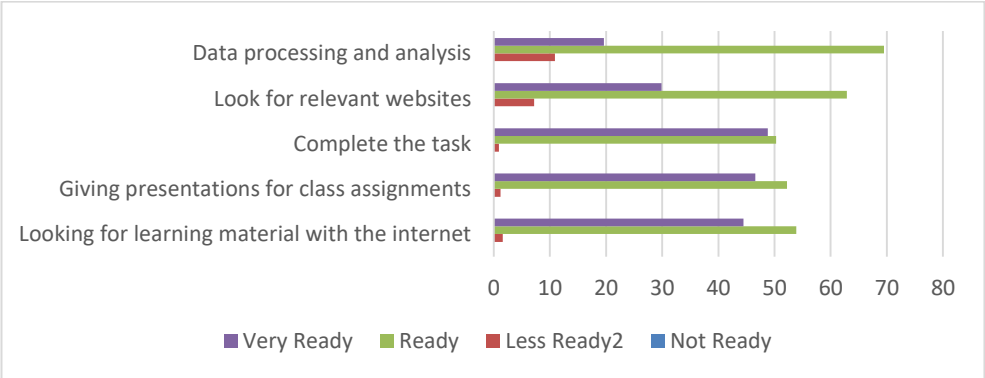


Figure 8. Use of Technology

The indicator of the use of technology for giving presentations for assignments skills in class shows that 98.8% of VHS teacher candidates already have good skills in the use of technology in giving presentations for assignments on the internet. Students are able to present varied assignments after material presentations. Furthermore, the indicator of the use of technology to complete assignments skills indicates that 99.1% of vocational teacher candidates already have good skills in using technology to complete assignments on the internet. As prospective teachers, students already have good abilities in utilizing technology to complete assignments or other obligations.

The indicator of the use of technology to search for relevant websites skills indicates that 92.8% of vocational teacher candidates already have good skills in the use of technology for relevant websites on the internet. Students usually still find obstacles in filtering data sources from websites found, so there are still 7.2% who are not ready to search for relevant sources of websites.

The indicator of the use of technology for process and data analysis skills shows that 89.1% of VHS teacher candidates already have good skills in using technology to search for learning materials on the internet. Students have been equipped to use technology-based evaluation tools in learning assessment courses, but students as prospective teachers sometimes still feel confused using technology for the appropriate data analysis process, so 10.9% are still not ready to use technology.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28057

Aspect of Technological Competency

In the aspect of competency in technology expertise, the readiness of vocational teacher candidates can be seen in Figure 9. Based on Figure 9, the indicator of the use of word processing applications skills indicates that all prospective vocational teachers already have good skills in using word processing applications, such as Microsoft Word. Students are already accustomed to using this application during college learning, so they find no obstacles in its use.

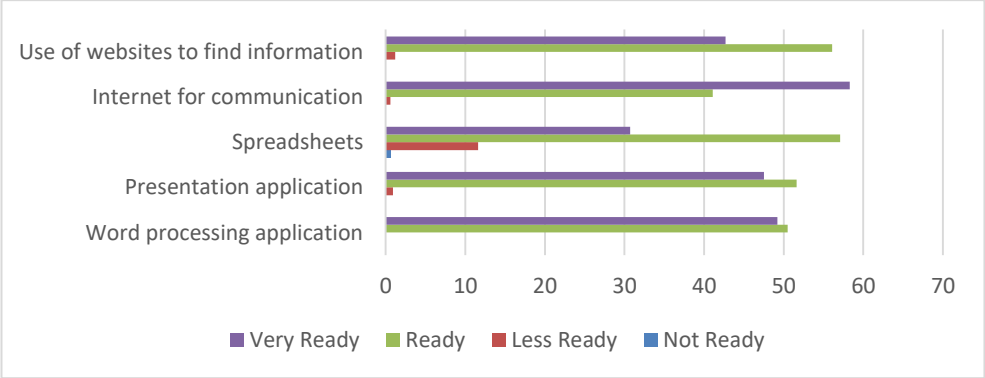


Figure 9. Competence of Technology Expertise

The indicator of the use of presentation application skills indicates that 99.1% of vocational teacher candidates already have good skills in using presentation applications, such as Microsoft PowerPoint. Students have often been trained to use this application to present assignments given during lectures. The remaining 0.9% feel they have not yet cheered because they have not mastered all the Microsoft PowerPoint application features. The indicator of the use of spreadsheets skills shows that 87.8% of VHS teacher candidates already have good skills in using the Spreadsheet application. Students have been equipped in-depth about this application program in excel automation courses while in college. Students who feel not ready to use this spreadsheet application because they still feel confused using the application's functions.

On the internet usage indicator for communication skills indicate that 99.4% of vocational teacher candidates already have good skills in using the internet for communication, such as email, WhatsApp, and others. The use of the internet is very helpful in facilitating teachers and students.

Then, the indicator of the use of the website to look for information skills indicates that 98.8% of vocational teacher candidates already have good skills in using websites to search for information. The ease of accessing this information is also influenced by the availability of free Wi-fi services provided by the Faculty of Economics during lectures.

Aspect of Training in the Use of Technology

In the aspect of training in the use of technology, the readiness of vocational teacher candidates can be seen in Figure 10. Based on Figure 10, the indicators of basic training using computer skills indicate that 78.7% of vocational teacher candidates have attended basic training using computers during lectures. By having the basic training provision, students have good readiness in dealing with the world of work in any field other than in education.

The indicators of word processing application training skills indicate that 71.3% of vocational teacher candidates have participated in word processing application training. These skills are needed in entering the workforce in any field so that mastery of skills illustrates good readiness in dealing with the world of work.

The indicators of presentation application training skills indicate that 70.7% of vocational teacher candidates have participated in a presentation application training. As many as 30% masters the presentation application from the results of following the tutorial on the internet and their peers. This presentation application training is really needed by students as prospective teachers because almost all learning material is explained using PowerPoint media.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28057

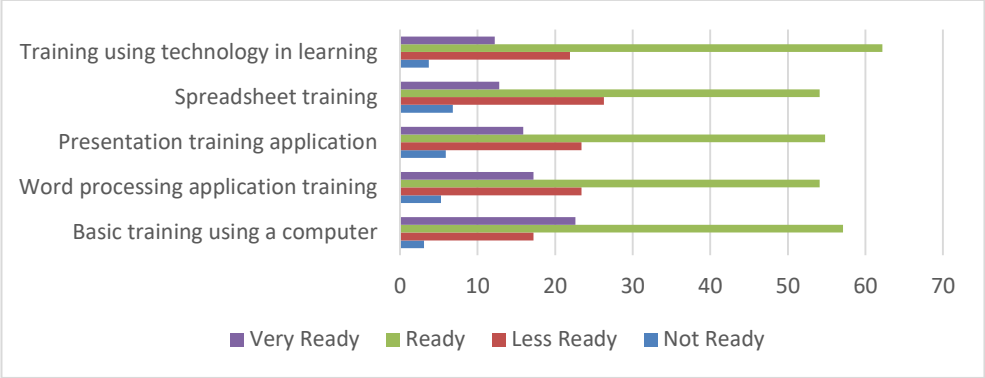


Figure 10. Training on Technology Use

The indicators of spreadsheet training skills indicate that 68.9% of vocational teacher candidates have participated in spreadsheet training, so they feel ready to face the world of work. Mastery of this application is needed, especially for graduates majoring in Economic Education related to financial management. Then, in the indicators of training indicators using technology in learning skills, 74.4% of vocational teacher candidates have participated in training using technology in learning obtained from workshops and seminars. This training is needed as a provision to optimize the use of technology in learning in the 21st century.

Based on the research results, it can be concluded that vocational teacher candidates have good readiness in the ability to master technology. During their education at the tertiary level, prospective graduates have been accustomed to using various technology-based applications and programs. Therefore, the use of technology in education continues to be developed at all levels of education (Lai, 2008, p. 18). Moreover, teachers candidates will face students in their teens who have become critical consumer segments because of the continuous exposure and familiarity with digital technology everywhere, so prospective teachers must be prepared to face these challenges (Mishra et al., 2018, p. 592).

Technology mastery is the employability skills needed by prospective teachers in the current age of learning (Winterton & Turner, 2019, p. 536). Prospective teachers must have a good mastery of technology to be able to provide information and learning experiences for their students. Especially in today's fast-paced world, technology-facilitated activities have become an integral part of providing educational services and in various companies (Ramaseshan et al., 2015, p. 754). The use of technology in learning will facilitate the learning process and create a pleasant learning atmosphere (Pratiwi et al., 2019, p. 186). Thus, teacher candidates who have a good mastery of technology will be able to create optimal learning.

CONCLUSION

Based on the research results, it can be concluded that vocational teacher candidates have good job readiness in dealing with the world of work in the 4th industrial era. This was indicated by more than 60% of prospective teachers who stated that they had good readiness in mastering teaching skills and mastering technology. The average student stated that he already had enough to face the world of work from the lecture process he had obtained. The average readiness in the aspect of teaching skills was 81.78%. In comparison, the average readiness in the aspect of technological mastery was 88.59%, so that it could be stated that students as VHS teacher candidates were very ready to face the world of work.

Teacher candidates already have good teaching skills because they are equipped with various theories and practices directly to the school, so that prospective teachers have the experience they are ready to use in dealing with the world of work. In the ability to master technology, vocational teacher candidates already have a good readiness to use technology in learning. As a developing country, Indonesia has the opportunity to encourage the growth of information and communication technology (such as the internet, telecommunications, and social media).

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28057

On the other hand, the prospective teachers feel they are still not optimal in mastering the spreadsheet application. However, this application is one of the applications most demanded to be mastered in the world of work in the industrial revolution era, which is closely related to the use of technology. Excel automation courses can be optimized for learning at university. Work skills can be improved by applying effective work practices, readiness to learn through various trainings, and competency-based technical skills according to the area of expertise they are capable of (Fitriyanto & Pardjono, 2019, p. 132).

ACKNOWLEDGMENT

The authors would like to deliver gratitude to the Lembaga Penelitian dan Pengabdian Masyarakat (LPPM) of Universitas Negeri Surabaya for supporting this work.

REFERENCES

Ambarawati, M. (2016). Analisis keterampilan mengajar calon guru pendidikan matematika pada mata kuliah Micro Teaching. *PEDAGOGIA: Jurnal Pendidikan*, *5*(1), 81–90. https://doi.org/10.21070/pedagogia.v5i1.91

Beraza, C. (2018). The changing nature of the graduate employment market: The fourth industrial revolution. In J. J. Turner & G. Mulholland (Eds.), *International Enterprise Education: Perspectives on Theory and Practice* (pp. 213–233). Routledge.

Cavanagh, J., Burston, M., Southcombe, A., & Bartram, T. (2015). Contributing to a graduate-centred understanding of work readiness: An exploratory study of Australian undergraduate students' perceptions of their employability. *The International Journal of Management Education*, *13*(3), 278–288. https://doi.org/10.1016/j.ijme.2015.07.002

Chui, M., Manyika, J., & Miremadi, M. (2016). Where machines could replace humans and where they can't (yet). *McKinsey Quarterly*, *3*, 58–69. https://www.mckinsey.com/business-functions/mckinsey-digital/our-insights/where-machines-could-replace-humans-and-where-they-cant-yet

Clarke, M. (2018). Rethinking graduate employability: The role of capital, individual attributes and context. *Studies in Higher Education*, *43*(11), 1923–1937. https://doi.org/10.1080/03075079.2017.1294152

Fitriyanto, M. N., & Pardjono, P. (2019). Factors affecting the employability skills of vocational students majoring mechanical engineering. *Jurnal Pendidikan Vokasi*, *9*(2), 132–140. https://doi.org/10.21831/jpv.v9i2.24420

Hager, P. J., & Holland, S. S. (2006). *Graduate attributes, learning and employability* (6th ed.). Springer.

Hanani, T., & Sukirno, S. (2016). Evaluasi kesiapan kerja mahasiswa akuntansi Universitas Negeri Yogyakarta menghadapi era Masyarakat Ekonomi ASEAN (MEA) 2015. *Nominal, Barometer Riset Akuntansi Dan Manajemen*, *5*(1), 34–53. https://doi.org/10.21831/nominal.v5i1.11475

Hidayat, S. M., Kuswana, W. S., & Untung, S. H. (2016). Eksplorasi kesiapan siswa memasuki dunia kerja pada program keahlian Teknik Kendaraan Ringan. *Journal of Mechanical Engineering Education*, *3*(2), 247–255. https://doi.org/10.17509/jmee.v3i2.4558

Huda, M. (2013). *Model-model pengajaran dan pembelajar (Isu-isu metodis dan paradigmatis)*. Pustaka Pelajar.

Lai, M. (2008). Technology readiness, internet self-efficacy and computing experience of professional accounting students. *Campus-Wide Information Systems*, *25*(1), 18–29. https://doi.org/10.1108/10650740810849061

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.28057

Lestari, I., & Siswanto, B. T. (2015). Pengaruh pengalaman prakerin, hasil belajar produktif dan dukungan sosial terhadap kesiapan kerja siswa SMK. *Jurnal Pendidikan Vokasi*, *5*(2), 183–194. https://doi.org/10.21831/jpv.v5i2.6384

Mishra, A., Maheswarappa, S. S., & Colby, C. L. (2018). Technology readiness of teenagers: a consumer socialization perspective. *Journal of Services Marketing*, *32*(5), 592–604. https://doi.org/10.1108/JSM-07-2017-0262

Pratiwi, V., Bahtiar, M. D., & Hardini, H. T. (2019). MAKSI for ICT-based accounting learning at vocational high schools. *Jurnal Pendidikan Vokasi*, *9*(2), 185–196. https://doi.org/10.21831/jpv.v9i2.26013

Prikshat, V., Kumar, S., & Nankervis, A. (2019). Work-readiness integrated competence model. *Education + Training*, *61*(5), 568–589. https://doi.org/10.1108/ET-05-2018-0114

Ramaseshan, B., Kingshott, R. P., & Stein, A. (2015). Firm self-service technology readiness. *Journal of Service Management*, *26*(5), 751–776. https://doi.org/10.1108/JOSM-08-2014-0216

Saputra, W., & Purnama, B. E. (2012). Pengembangan multimedia pembelajaran interaktif untuk mata kuliah organisasi komputer. *Journal Speed – Sentra Penelitian Engineering Dan Edukasi*, *4*(2), 60–67. https://doi.org/10.3112/speed.v4i2.865

Suttipun, M. (2014). The readiness of Thai accounting students for the ASEAN economic community: An exploratory study. *Asian Journal of Business and Accounting*, *7*(2), 139–157. https://ajba.um.edu.my/article/view/2700

Teng, W., Ma, C., Pahlevansharif, S., & Turner, J. J. (2019). Graduate readiness for the employment market of the 4th industrial revolution. *Education + Training*, *61*(5), 590–604. https://doi.org/10.1108/ET-07-2018-0154

Utami, Y. G. D., & Hudaniah, H. (2013). Self efficacy dengan kesiapan kerja siswa sekolah menengah kejuruan. *Jurnal Ilmiah Psikologi Terapan*, *1*(1), 40–52. https://doi.org/10.22219/jipt.v1i1.1356

Verma, P., Nankervis, A., Priyono, S., Mohd Salleh, N., Connell, J., & Burgess, J. (2018). Graduate work-readiness challenges in the Asia-Pacific region and the role of HRM. *Equality, Diversity and Inclusion: An International Journal*, *37*(2), 121–137. https://doi.org/10.1108/EDI-01-2017-0015

Voogt, J., Erstad, O., Dede, C., & Mishra, P. (2013). Challenges to learning and schooling in the digital networked world of the 21st century. *Journal of Computer Assisted Learning*, *29*(5), 403–413. https://doi.org/10.1111/jcal.12029

Winterton, J., & Turner, J. J. (2019). Preparing graduates for work readiness: An overview and agenda. *Education + Training*, *61*(5), 536–551. https://doi.org/10.1108/ET-03-2019-0044

Yustina, A., & Sukardi, T. (2014). Pengaruh bimbingan kejuruan, motivasi berprestasi, dan kemandirian siswa terhadap kesiapan kerja siswa kelas XII TKJ. *Jurnal Pendidikan Vokasi*, *4*(2), 181–194. https://doi.org/10.21831/jpv.v4i2.2544

Zenda, R. (2017). Essential teaching methods to enhance learner academic achievement in physical sciences in rural secondary schools. *Information and Learning Science*, *118*(3/4), 170–184. https://doi.org/10.1108/ILS-03-2017-0014

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

Jurnal Pendidikan Vokasi
Volume 10, No. 1, 2020 (69-79)
Online: http://journal.uny.ac.id/index.php/jpv

DEVELOPING THE TEACHING FACTORY LEARNING MEDIA IN A PUBLIC VOCATIONAL HIGH SCHOOL

Sintha Wahjusaputri[1]*, Elin Marlina[1], Siti Latifah[1]
[1]Universitas Muhammadiyah Prof. Dr. HAMKA
Jl. Raya Bogor Km. 23 No. 99, Rambutan, Ciracas, Kota Jakarta Timur, DKI Jakarta 13830, Indonesia

Abstract

This study aims to determine the success factors of the learning media of tutorial and skill e-report portfolios video-based in teaching factory learning outcomes in vocational high school. This study was the Research and Development model, through several stages, namely: (1) collecting data; (2) planning; (3) developing draft; (4) conducting initial trials; (5) revising the trial results; (6) conducting trial site research; (7) improving the productivity of the test results, (8) conducting test, (9) completing the final product; and (10) disseminating and implementing the result. This study was conducted at 58 Public Vocational High School, Jakarta. The samples were random sampling, consisting of 59 students majoring in painting and visual communication design in the control class and the experimental class. The instrument was a multiple-choice test sheet (multiple choice) through pre-test and post-test. The results of the study were analyzed using a t-test. The t-test average of the experimental class, Visual Communication Design, was 11.522. The t-test average of the control class was 10.832. Thus, the average learning outcomes of the experimental class were 0.69, which is bigger than in the control class. In the experimental class, Painting Class, the average learning outcome was 67, and the control class was 54.5. Therefore, there was a difference of 12.5. The hypothesis stated that there were differences in teaching factory learning resulted from the pre-test and post-test experimental classes majoring in Painting and Visual Communication Design. The instructional media of Tutorials and Skill E-Report Portfolio Video-Based got very good responses from students.

Keywords*: teaching factory, industrial learning, tutorial video learning media, video-based portfolio e-report skill*

How to cite: Wahjusaputri, S., Marlina, E., & Latifah, S. (2020). Developing the teaching factory learning media in a public vocational high school. *Jurnal Pendidikan Vokasi, 10*(1), 69-79. doi:https://doi.org/10.21831/jpv.v10i1.30222

***Corresponding Author:** Sintha Wahjusaputri sinthaw@uhamka.ac.id
Department of Management, Faculty of Economics and Business, Universitas Muhammadiyah Prof. Dr. HAMKA
Jl. Raya Bogor Km. 23 No. 99, Rambutan, Ciracas, Kota Jakarta Timur, DKI Jakarta 13830, Indonesia

https://doi.org/10.21831/jpv.v10i1.30222

INTRODUCTION

The learning process in a vocational high school considers the administration of education so that vocational graduates' objectives are reached properly. The vocational high school learning model is different from high school. Vocational high schools prioritize preparing students to enter the workforce and developing professional attitudes. The research conducted by Wahjusaputri et al. (2019) resulted that the composition of the industrial workforce in Indonesia according to education was dominated by SMK graduates reaching approximately 65% from 2016 to 2020. Along with the increasing number of vocational graduates' work participation rates in 2018-2019, vocational high school graduates' open unemployment rate is decreasing every year. The composition of the industrial workforce according to education is still dominated by vocational high school graduates reaching approximately 65.4% from 2016 to 2020, according to the results of research conducted by Wahjusaputri et al. (2019)**,** however, they added that the revitalization of vocational high school in teaching factories as production-based learning improves the competence and competitiveness of vocational students who are ready to work in the business and industrial world or *Dunia Usaha-Dunia Industri* (*DU -DI*). Teaching Factory Model is a concept of learning in production/ service-based vocational high schools that refers to standards and procedures applicable in the industry (*DU-DI*) and is carried out in an atmosphere as is the industry's case. To be competent, the concept of teaching factory learning applies an action-oriented learning approach in a production-technology learning environment (Reisinger et al., 2019). Therefore, teaching factory oriented learning combines existing learning, namely Competency-Based Training and Production Based Training. This means that a process of expertise or skill is designed and implemented based on actual procedures and standard operating procedures to produce products in line with market/ consumer demands.

The development of learning media is often arranged in the world of education. Innovation is, indeed, something that is needed to improve the quality of existing education. The problems in the field that researchers found were: (1) there were difficulties in studying the material of painting and visual communication design or *Desain Komunikasi Visual* (DKV); (2) the unclear lesson instructions; (3) the forms of learning that are still considered difficult to understand; (4) the absence of media that support the student's learning; (5) the need for an effective, efficient and pleasant learning atmosphere. One of the developments of learning media provided to vocational students is using the tutorial and portfolio learning media based on skill e-report video-based to achieve the teaching factory learning outcomes. These learning media use video as a medium to support the learning process. Video media has several advantages, such as displaying visual and audio, attracting attention, and saving time (Sadiman et al., 2007)**.** The concept of teaching factory (learning production) unites learning in the classroom with the work environment to foster real and relevant work and learning experiences according to the needs of the Business and Industrial World. Industrial teaching has two-way knowledge, where the first topic of industrial learning material is the basis of a synergy learning model between vocational and industrial subject programs. The industrial class aims at transferring what happens in industrial/ manufacturing environment activities to student courses in the classroom (Rentzos et al., 2014). Teaching factory learning aims to transfer the learning practices in the production/manufacturing environment to the classroom subjects. This way allows the students to understand what products will be needed by the Business and Industrial World (Mavrikios et al., 2018)**.** The learning in the work environment fosters relevant learning experiences and improves the teacher teaching competencies with industry standards (Chryssolouris et al., 2016)**.** According to Prinz et al. (2016)**,** the use of new communication technology uses physical Cyber-Systems in the manufacturing industry. Manufacture industry has a great influence on students and organizations (schools) with technical innovations in production. Abele et al. (2015) said that in industrial learning, a vocational school must be equipped with learning modules that are industry standard and must have a learning/teaching component and a production component, both services and products. The Business and Industrial World provide a series of learning materials and industry-standard work practices to students in producing an industrial product design standard. Mourtzis et al. (2018) argue that, based on industrial learning, to improve vocational schools' productivity and efficiency, we must apply renewable technology based on digitalization. Baena et

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30222

al. (2017) add that in industrial learning, material learning and technology infrastructure must be integrated. First, the material for the purchase must be in accordance with the needs of the industry. Students are given an industry standardized learning concept by an industrial instructor in producing a product. Industrial learning aims to increase the competence of students who are ready to use according to the business and industrial world's needs. After the explanation of the theory is completed, the students are trained to practice in the workshop/laboratory, in discussion groups (Stavropoulos et al., 2018)**.** Mavrikios et al. (2019) believe that the video data created during group assignments while following the subject is a good way to gain scientific insights in the process of developing student competencies. A study conducted by Stojkić and Bošnjak (2019) believes that to produce industrial learning, the level of education and technological infrastructure must be integrated.

Tvenge and Ogorodnyk (2018) explain that the teaching factory aims to improve students' competence who are adapting/standardizing industrial procedures. This helps students in using technology, one of the technologies carried out through video learning media tutorials based on skill e-report video. Learning media tutorials and portfolio skill e-report videos are learning media that use video to support the learning process. Video media has several advantages that can display visual and audio, attract attention, and save time (Sadiman et al., 2007)**.** Hence, it is concluded that by seeing and hearing, humans are easier to remember. In his research, Al Mamun (2014) explained that video can make the class more interesting, interactive, and effective. The study of Comiskey and McCartan (2011) mentioned that people remember 10% through reading, 20% through hearing, 30% of seeing, and 50% of hearing and seeing. Therefore, humans are easier to remember by seeing and hearing. Learning with video tutorial media is a follow-up of learning in vocational high schools. Besides, the video tutorial media is also used as an alternative solution to the limitations of existing infrastructure in schools. Before practicing, students learn the practices through video tutorials. From the results of the video tutorial learning, the students' practice videos are more simple, detailed, and repeatable. Video tutorials are lessons that record student activities not only from psychomotor but also record the attitude of the students. This video tutorial provides students the opportunity to observe and evaluate their practical work, both personally and feedback from friends. Skill E-report based portfolios video is made by students when implementing practices following the competency scheme through recordings made by study partners. From this recording, the teacher or instructor evaluates by referring to the video tutorial related to practice preparation, the use of work safety, equipment/machine operation, work steps, work attitude, and the final result. Skill e-report based video portfolios provide flexibility to teachers and students because they are not limited in space and time. The application of skill e-report video adjusts the condition of students' abilities and provides a lot of information so that the evaluation does not stop at the level of answering by memorizing and by direct practice recorded by his friends. This triggers the right brain to function more efficiently for students. Open-ended responses often arise because they require the teacher and students' skills to respond from various sides of the abundant available information.

RESEARCH METHOD

The research conducted by using the development or research and development (R&D) model is one of the research models that aim at producing certain products and test the validity and effectiveness of these products in their application. According to Sugiyono (2009), research and development aim to find, develop, and validate a product. The stages of research that carried out in the research strategy and development of teaching factory implementation using video tutorial models and video-based portfolio of e-report skill are: (1) collecting data research; (2) planning; (3) developing product draft; (4) conducting initial field trials; (5) revising the test results; (8) conducting the tests; (9) improving the final product; and (10) disseminating and implementing the results. The research was conducted at 58 SMK Negeri 58, SMEA 33- SMIK Street No.1, RT.3/ RW.1, Bambu Apus, Cipayung, City of East Jakarta (13890). SMKN 58, Jakarta has a unique vocational major, namely Textile Craft. Students are taught various ways and techniques to study textiles as the main material in the Textile Craft department. Starting from weaving, making batik to

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30222

learning macrame techniques. Uniquely, students are free to create as beautiful as possible to produce the desired product. Teaching factory implementation activities at SMK Negeri 58 Jakarta have used learning media on tutorial and skill e-report portfolio video-based as an evaluation to measure their students' competency.

The trial in class X, majoring in Painting and class XI majoring in Visual Communication Design (DKV) at 58 public vocational high school Jakarta, was carried out by dividing each department's class into two groups, namely one experimental class group and one control group. This trial was conducted in accordance with their respective majors. The art department explained the shape of the subject of painting while the Visual Communication Design (DKV) major explains Visual Communication Design. After everything finished, the students were given a questionnaire response to see students' responses to the learning media of Video Tutorials and Skill E-Report Portfolio Based as an alternative assessment of students' attitudes and skills. The data collection test techniques for need assessment were obtained through participatory observation or observation and interviews with the teaching teacher as well as some class X students in the painting department and class XI in the visual communication design (DKV) department. After the data collection test is completed, then the media validation and students' responses were used by the media validation questionnaire and the students' questionnaire responses, then the learning outcomes used a practical test. Media validation data and students' responses used an assessment grid consisting of several indicators. The grid for media validation is presented in Table 1, while the grid for the students' responses is shown in Table 2.

Table 1. Validation Grids of Learning Media Tutorial Video and Skill E-Report Portfolio Based

Variable	Sub Variable	Indicators
Tutorial Video Learning Material	Material and question	1. The accuracy of content and questions 2. The accuracy of questions and exercises 3. The clarity of the steps in the video material and questions 4. The ease to understand the instructional video
	Instructional Video	1. The correct vocabulary 2. Providing study assistance 3. The quality of sound
	Technical	1. Readability 2. Easy to use 3. Good quality of sound 4. The matching color with the background
	Language	1. The understadable of the language use 2. The appropriate grammar used 3. The communicative language used

Table 2. The Grids of Students' Reponses

Variable	Sub Variable	Indicators
Students' Responses on Video Tutorial Learning Media	Material	1. The understandable of content 2. The use of understandable language
	Media Illustrations	1. The clarity of video images display 2. The clarity of texts/letters 3. The compatiblity color with the display background 4. The ease of the meadia use 5. The attractive media display
	Benefit	1. The media fostering the students' interest 2. The media increasing the students' knowledge

The learning outcomes were calculated using the t-test by testing the conditions first. The number of painting class X was 32 students in 58 public vocational high schools located in Jakarta, amounting to two classes. Meanwhile, in the visual communication design class XI was 27, two classes were taken as respondents.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30222

RESULTS AND DISCUSSION

Results

In this study, the validation and reliability test questions were used before testing the hypothesis. The validation and reliability tests of the pretest and posttest questions are used to find out the validity of the questions that would be used as an instrument of knowledge assessment in the control class and experimental class. The validation test was done at 58 public vocational high schools in Jakarta, with the number of respondents in the painting department of 32 students in class X and the number of questions tested is 30 items. Whereas, in the department of visual communication design or *Desain Komunikasi Visual* (DKV), the number of respondents is 27 students in class XI, and the number of questions tested is 25 items. The results of the validation test in the form of valid questions are used as research material in the control class and the experimental class at 58 public vocational high schools in Jakarta. The analysis prerequisite test in this study used a question validation test and a question reliability test using Cronbach's Alpha.

Validation Test

The validation test is used to find out whether the question instrument is valid or invalid. Basic decision making, if $r_{count} > r_{table}$, then the instrument is declared valid. If $r_{count} < r_{table}$, the instrument question is declared invalid.

Table 3. The Results of Validation of Multiple Choice Questions in the Department of Visual Communication Design (DKV)

Number of Item	r_{xy}	r_{table}	Information
1	0	0.381	Invalid
2	0.759	0.381	Valid
3	0.020	0.381	Invalid
4	0.630	0.381	Valid
5	0.941	0.381	Valid
6	0	0.381	Invalid
7	0	0.381	Invalid
8	0.941	0.381	Valid
9	0.240	0.381	Invalid
10	0.941	0.381	Valid
11	0	0.381	Invalid
12	0.941	0.381	Valid
13	0	0.381	Invalid
14	0	0.381	Invalid
15	0	0.381	Invalid
16	0.112	0.381	Invalid
17	0.484	0.381	Valid
18	0.037	0.381	Invalid
19	0.941	0.381	Valid
20	0.941	0.381	Valid
21	0.941	0.381	Valid
22	0.941	0.381	Valid
23	0	0.381	Invalid
24	0.020	0.381	Invalid
25	1	0.381	Valid

Source: Researchers' data (2020)

The results of the analysis in Table 3 show that the output correlation between r_{counts} compared with r_{tables} obtained a significant value of 0.05 with the amount of data (n) = 25, then r_{table} obtains 0.381. Table 3 shows that 12 items are validated to 27 students. There are 12 valid items in which the correlation value is above r_{table}> 0.381. Meanwhile, 13 items are declared invalid because the correlation value is below the r_{table} <0.381. In conclusion, from the 25 items obtained, 11 items are experimented with, because the correlation value is above r_{table} 0.381.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30222

Reliability Test

The reliability test was used to determine the measuring instrument's consistency, whether the measuring instrument used was reliable and remained consistent if the measurement was repeated. For the reliability test, the researchers used Cronbach's Alpha method. If the Alpha value was greater than r_{table}, then the questionnaire items used were stated to be reliable or consistent. Conversely, if the Alpha value was smaller than the r_{table}, then the questionnaire items used were stated to be unreliable or inconsistent. Table 4 is the result of Cronbach's Alpha calculations with SPSS. Based on the results of Cronbach's Alpha, the questionnaire items used were declared to be relatively reliable because the alpha value is greater than the r_{table}.

Table 4. Reliability Result of Painting Class

Cronbach's Alpha	N of Items
0.833	25

Table 5. Validation Result of Multiple-Choice Questions Painting Department

Number of Item	r_{xy}	r_{table}	Information
1	0	0.349	Invalid
2	0	0.349	Invalid
3	0.426	0.349	Valid
4	0.290	0.349	Invalid
5	0.465	0.349	Valid
6	0	0.349	Invalid
7	0.043	0.349	Invalid
8	0.050	0.349	Invalid
9	0.326	0.349	Invalid
10	0.300	0.349	Invalid
11	0	0.349	Invalid
12	0.095	0.349	Invalid
13	0.015	0.349	Invalid
14	0.351	0.349	Valid
15	0.287	0.349	Invalid
16	0.275	0.349	Invalid
17	0.225	0.349	Invalid
18	0.350	0.349	Valid
19	0.574	0.349	Valid
20	0.503	0.349	Valid
21	0.260	0.349	Invalid
22	0.340	0.349	Invalid
23	0.097	0.349	Invalid
24	0.359	0.349	Valid
25	0.451	0.349	Invalid
26	0.418	0.349	Valid
27	0.102	0.349	Invalid
28	0.474	0.349	Valid
29	0.603	0.349	Valid
30	0	0.349	Invalid
31	1	0.349	Valid

Source: Researchers' data (2020)

The results of the analysis in Table 5 shows that the output correlation between r_{counts} compared with r_{tables} obtains a significant value of 0.05 with the amount of data (n)=31, then r_{table} obtains 0.349. Table 5 shows that 11 items are validated by 32 students. There are 11 valid items in which the correlation value is above r_{table} >0.349. Meanwhile, 20 items are declared invalid because the correlation value is below r_{table} <0.349. Thus, from the 31 items obtained, 11 items are experimented with, because the correlation value is above r_{table} 0.349. Table 6 presents the result of Alpha Cronbach's calculations Department of Visual Communication Design (DKV). Based on the results

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30222

of Cronbach's Alpha, the questionnaire items used are declared to be relatively reliable because the alpha value is bigger than r_{table}.

Table 6. Reliability Result of Visual Communication Design Class

Cronbach's Alpha	N of Items
0.354	30

Normality Test

A normality test was used to determine whether the population was normally distributed. The basis of significance or probability value <0.05, then the data distribution was not normal, whereas if the significance value or probability value >0.05, then the data was normally distributed.

Table 7. Normality Test Results in the Control Class and Experiment Class at the Department of Painting and Visual Communication Design

Hypothesis Analysis Test	Asymp. Sig. (2-tailed)	Decision
Class Pretest (Painting Test)	0.269	Normal
Class Posttest (DKV Class)	0.473	Normal

Source: Researchers' Data (2020)

Based on Table 7, the pretest and posttest normality of the control class and the experimental class resulted in a significance level of more than 0.05. It shows that the results of the data's significance in the control class in the painting class is 0.150, with the results of the significance of the data in the experimental class of 0.269 is normally distributed. The DKV class shows that the results of the pretest and posttest normality of the control class and the experimental class with a significance level are bigger than 0.05 of 0.08 with the results of the significance of the data in the experimental class of 0.473 is normally distributed.

Data Analysis and Hypothesis Testing

Based on the results of research in the control class and the experimental class, there are differences in the results of the answers to the pretest and posttest questions. The questions consist of 25 multiple choice questions in the visual communication design (DKV) department and 30 multiple choice questions in the painting class.

Table 8. The Results of Pre-test and Post-test in Painting Experiment Class

Respondent	Pre-Test Value	Post-Test Value	Respondent	Pre-Test Value	Post-Test Value
Respondent 1	57	73	Respondent 17	57	73
Respondent 2	40	57	Respondent 18	55	60
Respondent 3	50	57	Respondent 19	55	57
Respondent 4	57	63	Respondent 20	53	77
Respondent 5	53	73	Respondent 21	56	67
Respondent 6	50	63	Respondent 22	57	63
Respondent 7	50	57	Respondent 23	53	57
Respondent 8	50	57	Respondent 24	60	70
Respondent 9	57	73	Respondent 25	53	60
Respondent 10	77	77	Respondent 26	50	73
Respondent 11	57	73	Respondent 27	53	67
Respondent 12	53	67	Respondent 28	70	57
Respondent 13	70	60	Respondent 29	75	90
Respondent 14	47	80	Respondent 30	85	90
Respondent 15	47	67	Respondent 31	60	63
Respondent 16	53	63	Respondent 32	65	60

Table 8 is an assessment of the learning outcomes of Class X students. Class X is an experimental class with a total of 32 students whose lowest value is 45, and the highest value is 85. The

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30222

posttest results show that the lowest value is 55, and the highest value is 95. Based on the research results, in class X as an experiment class, it is known that after learning using learning media of tutorial and skill e-report portfolios video in delivering painting teaching factory material, students' value has increased.

Table 9. The Results of Pre-test and Post-test in Experimental Classes of Visual Communication Design (*DKV*)

Respondent	Pre-Test Value	Post-Test Value	Respondent	Pre-Test Value	Post-Test Value
Respondent 1	57	73	Respondent 15	64	88
Respondent 2	40	57	Respondent 16	60	88
Respondent 3	50	57	Respondent 17	60	92
Respondent 4	57	63	Respondent 18	68	92
Respondent 5	53	73	Respondent 19	68	48
Respondent 6	50	63	Respondent 20	16	88
Respondent 7	50	57	Respondent 21	68	92
Respondent 8	50	57	Respondent 22	64	92
Respondent 9	57	73	Respondent 23	48	88
Respondent 10	77	77	Respondent 24	56	88
Respondent 11	57	73	Respondent 25	60	88
Respondent 12	53	67	Respondent 26	60	96
Respondent 13	70	60	Respondent 27	60	88
Respondent 14	47	80			

Source: Researchers' Data (2020)

Table 9 is an assessment of the learning outcomes of class XII students. The experimental class resulted in class XII pretest, with a total of 27 students has the lowest value of 16 and the highest value of 72, while the posttest resulted in the lowest value of 48 and the highest value of 96. Based on the results in class XII as an experimental class, it is known that after learning using learning media of tutorial and skill e-report portfolio video in submitting teaching factory material, the Visual Communication Design (DKV) has increased.

Hypothesis Test

From the hypothesis test in Table 10, it is known that the experimental class value is 8.523 with a significance of 0.000, t_{table} of df = 31 is obtained at a significance level of 5% is 1.684. Thus, the value of $t_{count} > t_{table}$ (8.523> 1.684) and the significance value is less than 0.05 (p = 0.000 <0.05). From Table 10, the control class value is 7.580 with a significance of 0.000, t_{table} of df = 31 is obtained at a significance level of 5% is 1.684. Thus, the value of $t_{count} > t_{table}$ (7.580 > 1.684) and the significance value is less than 0.05 (p = 0.000<0.05). It is concluded that there are significant differences in the scores of students learning outcomes in the experimental class and the control class on the effectiveness of instructional media of tutorials and skill e-report portfolio video or there is a difference between the pretest and posttest results of the experimental class and the pre-test and post-test results of the control class majoring in painting.

Table 10.The Result of Paired Samples T-Test for Control Class and Experiment Class for Painting

Experimental Class	t	df	Sig (2 tailed)
Pair 1 Pretest-Posttest	8.523	31	.000
Control Class	t	df	Sig (2 tailed)
Pair 1 Pretest-Posttest	7.580	31	.000

Table 11.The Results of Paired Samples T-Test for Control Class and Experiment Class for Visual Communication Design (DKV)

Experimental Class	t	df	Sig (2 tailed)
Pair 1 Pretest-Posttest	11.522	27	0.000
Control Class	t	df	Sig (2 tailed)
Pair 1 Pretest-Posttest	10.832	27	0.000

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30222

From Table 11, the result of the post-test t-test revealed that the average learning outcomes of the visual communication design experimental class (DKV) is 11.522, and the average learning outcomes of the control class is 10.832. Thus, it is concluded that the average learning outcomes of the experimental class have a difference of 0.69, which is big compared to the control class. From this Table 11, it is known that the t value is 11.522, with a significance of 0.000. The obtained t_{table} of df = 27 at a significance level of 5% is 1.703. Thus, the value of $t_{count} > t_{table}$ (11.522> 1.703) and the significance value is less than 0.05 (p = 0.000 <0.05).

Discussion

Based on the result in the painting and visual communication design (DKV) group of the control class, there are several deficiencies in the video tutorial learning media product, namely the technique of painting shapes or pictures of objects. According to Cvetkova et al. (2010), video tutorial learning media has a very interesting function and directs students' attention to concentrate on learning material related to the visual meaning displayed. Further research by Summak et al. (2010) explains that technological advances through video tutorial media have some advantages, such as the easy use of video tutorial media; relevant subject matter; the multimedia can be used repeatedly by each student; the addition of visual image features and the layout of the main menu layout is more colorful to attract the attention of students. These advantages certainly improve students' learning outcomes in the field of painting and visual communication design (DKV) and make it easier for students to learn independently. Jaber et al. (2018) stated that the instructional video tutorial media in the learning process, especially painting and visual communication design attracts interests and stimulates students' learning. Research by Azer (2009) explained that the use of video tutorial media in teaching and learning generates new desires and interests, arouses motivation and stimulates learning activities, and even psychologically affects students. Therefore, the use of video tutorial learning media improves students' learning outcomes classically by 85%.

CONCLUSION

The process of designing video tutorial learning media for competency standards in the major of painting and visual communication design was carried out through four stages, namely: stage of concept creation; the stage of making video tutorials; testing phase; and product distribution stage. The function of video tutorials for the painting and visual communication design (DKV) based on skill e-report illustrates the reality of students' activities during practice related to the competencies being studied or tested, as follows: creating the students' attitudes and behaviors following the world of work that has responsibility answer so that the task is completed under the target; students can easily repeat the steps they have learned just by opening the video as a reference when in the workforce; students have the provisions to promote themselves in the world of work; and with the video, students can inspect related to work attitude, work steps, use of work safety to improve the completion of the next job sheet. Furthermore, based on the research findings, it is concluded that the learning media in teaching factory attracted student's interests and facilitated students in learning.

ACKNOWLEDGMENT

The researchers would like to thank the Ministry of Education and Culture Directorate of Vocational High School, the Republic of Indonesia as research partner; Research Institute of The Muhammadiyah University of Prof. DR. HAMKA; Director of the UHAMKA Post-Graduate School; principals, teachers, staffs, and students of 58 Public Vocational High School in Jakarta.

REFERENCES

Abele, E., Metternich, J., Tisch, M., Chryssolouris, G., Sihn, W., ElMaraghy, H., Hummel, V., & Ranz, F. (2015). Learning factories for research, education, and training. *Procedia CIRP*, *32*(Clf), 1–6. https://doi.org/10.1016/j.procir.2015.02.187

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30222

Al Mamun, M. A. (2014). *Effectiveness of audio-visual aids in language teaching in tertiary level* [Doctoral thesis. BRAC University, Dhaka]. http://dspace.bracu.ac.bd/xmlui/handle/10361/3288

Azer, S. A. (2009). Interactions between students and tutor in problem-based learning: The significance of deep learning. *The Kaohsiung Journal of Medical Sciences*, *25*(5), 240–249. https://doi.org/10.1016/S1607-551X(09)70068-3

Baena, F., Guarin, A., Mora, J., Sauza, J., & Retat, S. (2017). Learning factory: The path to industry 4.0. *Procedia Manufacturing*, *9*, 73–80. https://doi.org/10.1016/j.promfg.2017.04.022

Chryssolouris, G., Mavrikios, D., & Rentzos, L. (2016). The teaching factory: A manufacturing education paradigm. *Procedia CIRP*, *57*, 44–48. https://doi.org/10.1016/j.procir.2016.11.009

Comiskey, D., & McCartan, K. (2011). Video: An effective teaching aid? An architectural technologist's perspective. *Transactions*, *8*(1), 25–40. https://doi.org/10.11120/tran.2011.08010025

Cvetkova, B., Andonovska-Trajkovska, D., & Atanasoska, T. (2010). Values of some strategies of teaching and learning in fine art education. *Procedia - Social and Behavioral Sciences*, *2*(2), 2841–2845. https://doi.org/10.1016/j.sbspro.2010.03.425

Jaber, M. Y., Glock, C. H., & Zanoni, S. (2018). A learning curve with improvement in process quality. *IFAC-PapersOnLine*, *51*(11), 681–685. https://doi.org/10.1016/j.ifacol.2018.08.397

Mavrikios, D., Georgoulias, K., & Chryssolouris, G. (2018). The teaching factory paradigm: Developments and outlook. *Procedia Manufacturing*, *23*(2017), 1–6. https://doi.org/10.1016/j.promfg.2018.04.029

Mavrikios, D., Georgoulias, K., & Chryssolouris, G. (2019). The teaching factory network: A new collaborative paradigm for manufacturing education. *Procedia Manufacturing*, *31*, 398–403. https://doi.org/10.1016/j.promfg.2019.03.062

Mourtzis, D., Zogopoulos, V., & Vlachou, E. (2018). Augmented reality supported product design towards industry 4.0: A teaching factory paradigm. *Procedia Manufacturing*, *23*(2017), 207–212. https://doi.org/10.1016/j.promfg.2018.04.018

Prinz, C., Morlock, F., Freith, S., Kreggenfeld, N., Kreimeier, D., & Kuhlenkötter, B. (2016). Learning factory modules for smart factories in industrie 4.0. *Procedia CIRP*, *54*, 113–118. https://doi.org/10.1016/j.procir.2016.05.105

Reisinger, G., Trautner, T., Hennig, M., Alexandra, G. R., Mazak, T., Hold, P., Gerhard, D., & Mazak, A. (2019). TU Wien pilot factory industry 4.0. *Procedia Manufacturing*, *31*, 200–205. https://doi.org/10.1016/j.promfg.2019.03.032

Rentzos, L., Doukas, M., Mavrikios, D., Mourtzis, D., & Chryssolouris, G. (2014). Integrating manufacturing education with industrial practice using teaching factory paradigm: A construction equipment application. *Procedia CIRP*, *17*, 189–194. https://doi.org/10.1016/j.procir.2014.01.126

Sadiman, A. S., Rahardjo, R., Haryono, A., & Rahardjito, R. (2007). *Media pendidikan: Pengertian, pengembangan dan pemanfaatannya*. Raja Grafindo Persada.

Stavropoulos, P., Bikas, H., & Mourtzis, D. (2018). Collaborative machine tool design: The teaching factory paradigm. *Procedia Manufacturing*, *23*(2017), 123–128. https://doi.org/10.1016/j.promfg.2018.04.004

Stojkić, Ž., & Bošnjak, I. (2019). Development of learning factory at FSRE, University of Mostar. *Procedia Manufacturing*, *31*, 180–186. https://doi.org/10.1016/j.promfg.2019.03.029

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30222

Sugiyono, S. (2009). *Metode penelitian pendidikan pendekatan kuantitatif, kualitatif, dan R&D*. Alfabeta.

Summak, M. S., Samancio, M., & Ba, M. (2010). Technology integration and assesment in educational settings. *Procedia - Social and Behavioral Sciences*, *2*(2), 1725–1729. https://doi.org/10.1016/j.sbspro.2010.03.973

Tvenge, N., & Ogorodnyk, O. (2018). Development of evaluation tools for learning factories in manufacturing education. *Procedia Manufacturing*, *23*, 33–38. https://doi.org/10.1016/j.promfg.2018.03.157

Wahjusaputri, S., Fitriani, S., & Syarif, S. (2019). Canvas model business as an innovation of teaching factory learning in the dashion department of 27 Public Vocational High School, Jakarta. *Dinamika Pendidikan*, *14*(2), 142–154. https://doi.org/10.15294/dp.v14i2.21167

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

Jurnal Pendidikan Vokasi
Volume 10, No. 1, 2020 (80-92)
Online: http://journal.uny.ac.id/index.php/jpv

THE IMPLEMENTATION OF BLOCK-SYSTEM LEARNING ON THE EXPERTISE COMPETENCE OF AUTOMOTIVE LIGHTWEIGHT VEHICLE ENGINEERING IN VOCATIONAL HIGH SCHOOL

Nurul Burhan[1]*, Zainal Arifin[1]
[1]Universitas Negeri Yogyakarta
Jl. Colombo No. 1, Karangmalang, Depok, Sleman, Yogyakarta 55281, Indonesia

Abstract

The research concerned here was to discover (1) the effectiveness of block-system learning as viewed from the teacher aspect; (2) the effectiveness of such learning as viewed from the student aspect; (3) the effectiveness of such learning as viewed from the facility and resource aspect; and (4) the students' learning achievement after an application of such learning. The study is descriptive and quantitative research, using a survey approach. The data were compiled through observation, questionnaire use, and documentation. The results indicate that (1) the effectiveness of block-system learning as viewed from the teacher aspect is very high in scale; (2) the effectiveness of block-system learning as viewed from the student aspect is very high in scale; (3) the effectiveness of block-system learning as viewed from the facility and resource aspect is high in scale; and (4) with block-system learning, students' learning achievement, as evaluated through UKK (Uji Kompetensi Keahlian or 'Expertise Competence Test'), improves.

Keywords: *effectiveness of learning, block-system, automotive light-vehicle engineering, state vocational high school, UKK value*

How to cite: Burhan, N., & Arifin, Z. (2020). The implementation of block-system learning on the expertise competence of automotive lightweight vehicle engineering in vocational high school. *Jurnal Pendidikan Vokasi*, *10*(1), 80-92. doi:https://doi.org/10.21831/jpv.v10i1.30378

***Corresponding Author:** Nurul Burhan nurulburhan104@gmail.com
Department of Technology and Vocational Education, Graduate School, Universitas Negeri Yogyakarta
Jl. Colombo No. 1, Karangmalang, Depok, Sleman, Yogyakarta 55281, Indonesia

https://doi.org/10.21831/jpv.v10i1.30378

INTRODUCTION

A nation could be called progressive if it has quality human resources. Such human resources constitute the most important asset to make a nation an advanced one. One of the strategic ways to improve the quality of human resources is to do it through education. Education here refers to a deliberate and planned effort to create a learning atmosphere in a learning process so that the students actively develop their potential for the possession of the spiritual and religious strength, self-control, personality, and intelligence; the praiseworthy character; and the skills needed by themselves and their society, nation, and country (Law of Republic of Indonesia No. 20 of 2003).

One of the forms of education in existence in society is that run at vocational high school. According to Sudira (2012, p. 13), vocational education is interpreted as the education designed to develop the potential of students at a formal educational institution in especially the knowledge, skill, and attitude needed by workers and specifically suitable for their fields of expertise prior to entering into the world of work. Vocational high school is one of the forms of an educational institution at the middle level of education, which prioritizes the development of students' competence in executing a certain kind of work (Government Regulation No. 29 of 1990).

In agreement with the abovementioned concept, Rauner and Maclean (2008, p. 433) also explain that Technical Vocational Education Training (TVET) is understood as a system of technical and vocational education that functions to give a supply of a qualified and skilled workforce to the prevailing types of production of a country, region, or sector or to equip people with the skills and competencies demanded by the labor market. It means that the technical part of training in vocational education functions to prepare a workforce with qualification and skillfulness in certain fields which are accepted in a country, region, or industry or to equip individuals with skills that meet the needs of the market, which is, in this case, the world of business or industry.

From those several opinions on the definition of vocational education, it is concluded that vocational education is a learning activity of a certain type that emphasizes one's skills of working according to one's interest and aptitude so graduates of that education possess the needed knowledge, capability, intelligence, and competence; praiseworthy morals; and high work ethic as well as highly-qualified skills to be able to have jobs or become entrepreneurs after finishing their learning.

SMK, as the shorter term for *Sekolah Menengah Kejuruan,* is what the vocational high school in Indonesia is called. SMKs differ from one another in vision and mission, and yet their objective is almost the same, namely, preparing a younger generation that is ready to work in order to meet the demand for workers in the circles of the business or industrial world. In general, the SMK vision is shaping the individuals and ecosystem of SMK education that possess a character based on the principle of *gotong royong* (i.e., something like cooperation, teamwork, or working together). To turn the vision to reality, SMK has the mission of (1) actualizing strong agents or practitioners of SMK education; (2) actualizing a widening, evenly-distributed, and fair access to SMK; (3) actualizing quality education at SMK; and (4) actualizing the management with effectiveness improvement in bureaucracy and public involvement (Setiawan, 2016).

With the afore-mentioned vision and mission of SMK as a basis, SMK has the objective of preparing a younger generation competent and skillful in accordance with their respective fields of expertise. As mentioned in part of a presidential regulation referred to as the Government Regulation No. 17 of 2010, on article 76, sunsection 2, SMK education has the function and objective of (1) preparing the students in order that they become personalities that are independent/self-dependent, productive, and capable of working in industrial or business circles in accordance with their expertise competence; (2) equipping them with science/knowledge, skills, and technology in order that they are capable of future self-development; (3) preparing them in order that they become strong in determination, capable of choosing a career, persistent, capable of adapting to their society, and professional in attitude concerning the field of expertise that they pursue; and (4) arming them with expertise competence for living within a society and continuing their education at a university.

To actualize the vision, mission, and objective expounded upon above, one of the efforts made by SMK Negeri (or SMKN or State SMK) in Kabupaten (or Regency or Sub-Province of) Batang was applying the learning with the block-system model. The application of the block-

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30378

system learning at SMK Negeri in Kabupaten Batang had the purpose of scheduling classes of subjects called productive subjects close together, instead of being interspersed with classes of subjects called normative and adaptive subjects, so that the material could be received wholly by students. It is inseparable from the purpose of SMK, as stated by Djojonegoro (1998), by saying that if all this time, the purpose of the education at vocational school has been merely of getting a diploma, now it should be replaced with that of getting competence. It is also in line with the purpose of education at vocational high school, as previously mentioned, which is to get its graduates ready with the competence needed by the world of business or industry. The reason is that there is indeed a priority for SMK graduates to enter the world of work after graduating directly.

Kabupaten Batang is part of the province of Jawa Tengah (or Central Java), within which it shares borders with Kabupaten Kendal to the east, Kabupaten Banjarnegara to the south, Kota (or City of) Pekalongan to the west, and also Laut Jawa (or Java Sea) to the north. The data from AsliBatang.com (n.d.) indicate that Kabupaten Batang has 28 SMKs, which consist of 4 SMKNs and 24 private SMKs. Three of the SMKNs, i.e., SMKN 1 Kandeman, SMKN 1 Warungasem, and SMKN 1 Blado, have the expertise program of TKRO (short for *Teknik Kendaraan Ringan Otomotif*, or, alternatively, 'Automotive Light-Vehicle Engineering'). Of these three, the two last mentioned have already applied the block learning system.

According to results of interviews during observations at one of the SMKNs applying block-system learning, among the subjects listed in the curriculum to be taught in classes, there are subjects called productive subjects, and a class of a productive subject is divided into two parts differing in nature and respectively considered theory and practice, unlike that of a normative or adaptive subject, which, in form, consists of only theory and could be delivered verbally without having to prepare equipment and materials as in a practice class. In a productive subject class, before the learning itself is conducted, there has to be a preparation of certain equipment and materials specifically related to a certain expected product. Before the application of block-system learning at the SMK, it has often happened that when the students were still concentrating on their practice work, suddenly the time was up with the students' work not yet finished and with them having to turn to a class of a normative or adaptive subject. The respondents interviewed express that such a matter is not so effective for conducting learning (interview with Mr. IMD).

The learning system long in use at SMK for classes of productive subjects, as previously mentioned, briefly said, consists of theory and practice. According to results of observations in the field at one SMK Negeri in Kabupaten Batang, before a learning process for practice activity, there is a preparation of equipment and materials for around 15-20 minutes and an activity of cleaning and tidying up the practice place (which may be more like a workshop) for an additional 10 minutes. If there are four to six hours of a learning session, students already lose 30 minutes of the learning time. What often happens is that the students are still in the process of analyzing components and are not yet doing an experiment in turns within their groups when the time is up, and they have to resume the work in the following week.

Hari/jam	1	2	3	4	5	6	7	8	9	10
Senin	TDO				PDTO					ENG
Selasa	GTO				Seni Budaya			AGAMA		
Rabu	SKD				FISIKA		PKN		PJOK	
Kamis	MTK		BI		KIMIA			S.I		
Jum'at	B.J		MTK		B.I		ENG		PRAMUKA	
Kelas X TKRO I										
Senin	PSPTKR				PMKR					
Selasa	PJOK		MTK		ENG			B.I		
Rabu	PKKR						PSPTKR			
Kamis	PKK			BJ	PKKR			AGAMA		
Jum'at	PMKR		MTK		PKK				PKN	
Kelas XI TKRO I										
Senin	PKKR						PSPTKR			
Selasa	AGAMA			PKN		B.I		PMKR		
Rabu	PSPTKR				PMKR					
Kamis	B.J		MTK		PKK				JEPANG	
Jum'at	MTK		PKK				ENG		PKKR	
Kelas XII TKRO I										

Figure 1. Scheduling of Productive Subjects in Non-Block System

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30378

The distribution of class hours for productive subjects is based on the structure of the 2nd revision of Curriculum 2013 in 2018. For Grades XI and XII (which are the last two of the three grades at SMK), concerning the following subjects, i.e., PMKR (*Pemeliharaan Mesin Kendaraan Ringan* or 'Light-Vehicle Mechanical Maintenance'), PSPTKR (*Pemeliharaan Sasis dan Pemindah Tenaga Kendaraan Ringan* or 'Light-Vehicle Cassis and Power Transmission Maintenance'), and PKKR (*Pemeliharaan Kelistrikan Kendaraan Ringan* or 'Light-Vehicle Electricity Maintenance'), there are 8-9 class hours for each subject in a week so that in total there are 24-25 class hours for learning the afore-mentioned productive subjects every week. According to results of documentation at SMK Negeri in Kabupaten Batang applying non-block learning, technically, the scheduling of the class hours is as in Figure 1.

Based on Figure 1, for Grades XI and XII, in the class scheduling of productive subjects employing the non-block system, in a week the classes are mixed with those of normative and adaptive subjects; if one class session requires preparation of equipment and materials, it would cause a waste of lots of time. Research by Masbahah et al. (2014) on SMKs in the city of Surabaya states that the constraints in the non-block (or conventional) learning system are that (1) the teacher does much preparation of the learning plan, (2) the execution of the learning is not optimum, and (3) the learning evaluation could not be done well. The execution of the learning is not optimum because (1) the materials of productive subjects could not be delivered wholly, (2) the materials of productive subjects could not be developed and studied in-depth, (3) the students could not master the materials of productive subjects well, (4) the students feel that the time allocated for the practice being done is still not enough, (5) the method of conducting the learning is not varied enough, and (6) the facilities provided by the school do not yet meet the standard for SMK facilities and resources.

Block-system learning is the learning conducted with a management system that schedules classes of a productive subject, for example, in one group, meaning that, instead of being scheduled in separation from each other, interspersed with classes of other productive subjects or classes of normative or adaptive subjects, the classes of the said productive subject in a week is grouped into one or more sessions that, though relatively brief, still get a long time portion in each learning period. Majid et al. (2011) believe that block-system learning is the learning conducted by combining the study hours of class sessions of a subject so the session previously done once a week until the finish changes into sessions done in one full week or more until the subject is finished with the materials being able to be delivered in a maximum way and in accordance with the demand of the curriculum as the standard of measurement.

According to LAB Board of Governors (1998), the scheduling of learning using the block system arranges the learning sessions that there are relatively fewer sessions but with a longer time in each session, which enables the activity in the learning to become more flexible. The objective of block-system learning is to improve students' effectiveness in learning. It could also be beneficial by making the relationship between the teacher and the students become better in the learning process and encouraging the teacher to be innovative by simultaneously using several learning methods and improving the school's learning climate and making it more varied. In line with this, Suwati (2008, p. 89) also explains that the block system is the grouping of effective study (or learning) hours in time units that enables learners to attend to and receive learning materials to the maximum and wholly.

The objective of learning is to attain the maximum achievement conforming to the objective. Learning achievement is an important matter in teaching and learning activity. Students' learning achievement determines how much of the learning objective that has been designed could be attained. Besides, the educator also uses learning achievement as standard of measurement of the success in the learning. One of the factors determining the degree of students' learning achievement is the teacher's role because the teacher's main function is designing, managing, and evaluating the learning. The teacher has the obligation of transferring a set of the knowledge that he/she possesses to the students so that from that knowledge comes what becomes part of the students' attitude.

Effective learning can be known if the learners could attain the KKM (*Kriteria Ketuntasan Minimal* or 'Minimum Mastery Criteria') predetermined by the school authorities. Anderson et al. (2005) explain that outcomes are the consequences or results associated with instructional experiences, the end results of institutional programs or curricular goals. Thus, the emphasis of outcome-

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30378

based education is not on acceptance of any "results" but on efforts to produce the specific results based on predetermined agreement realized through consensus. The same in tone with that concept, Saefuddin and Berdiati (2016, p. 34) state that effective learning could be attained if the learning could give new experience, shape students' competence, and get them to the goal that they want to attain. It is in line with Kyriacou (2009, p. 7) who states that effective teaching could be defined as the teaching that successfully achieves the learning by pupils intended by the teacher.

The application of block-system learning at particularly SMK Negeri in Kabupaten Batang since the school year of 2018-2019 as one-year-long learning had never been previously studied, so that how effective it was was not yet known. Therefore, in the research concerned here, the objective was to know the effectiveness of block-system learning as viewed from the aspects of the teacher, the students, and the facilities and resources as variables and to know the students' learning achievement after an application of block-system learning on the expertise competence of TKRO (*Teknik Kendaraan Ringan Otomotif* or 'Automotive Lightweight-Vehicle Engineering') at SMK Negeri in Kabupaten Batang.

RESEARCH METHOD

The type of this research is descriptive and quantitative research with a survey approach. The data were compiled by means of observation, questionnaire use, and documentation. The research was conducted at SMK Negeri in Kabupaten Batang on the field of the said expertise competence of TKRO. Data on SMK Negeri in Kabupaten Batang are presented in Table 1.

Table 1. Data on SMK Negeri in Kabupaten Batang

Schools Name	Address
SMK Negeri 1 kandeman	Jl. Raya kandeman. KM.N0.04. Kec. Batang (51261)
SMK Negeri 1 Warungasem	Jl. Banjiran, Sawahjoho. KM. 08. Kec. Warungasem (51252)
SMK Negeri 1 Blado	Jl. Blado. KM. 02. Desa Cokro. Kec. Reban (51255)

A purposive sampling technique was employed in the research. As a result, two schools, SMK Negeri 1 Warungasem and SMK Negeri 1 Blado, were used as objects of the research, considering that those two were the only ones around belonging to the population that had applied block-system learning. The research did not compare the qualities of learning achievement. Instead, it measured the effectiveness of block-system learning that had been applied. For particularly the sample determination, disproportional stratified random sampling was used. The sample was part of the population of students of Grade XII at the two schools. Details related to the sample determination can be seen in Table 2.

Table 2. Sample of Determination

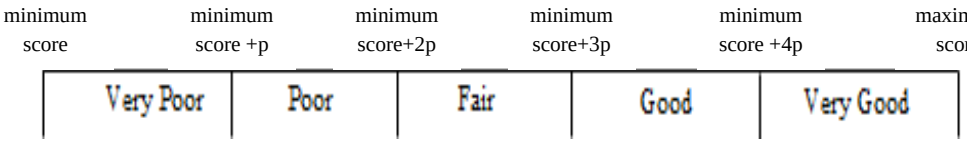
Schools Name	Population	Percentage	Sample
SMK Negeri 1 Warungasem	72	25%	19
SMK Negeri 1 Blado	70	25%	18
Value			37

A research instrument was constructed and developed in a questionnaire form based on the theoretical review so some sub-variables were established. The sub-variables were three in number, i.e., learning effectiveness viewed from the teacher aspect, viewed from the student aspect, and viewed from the facility and resource aspect. The Likert scale was used to measure each variable.

The data were processed by using descriptive-quantitative analysis. From the data obtained from the questionnaire, the total score for each variable was calculated. The result was then interpreted. With the interpretation as a basis, a conclusion was then made. The interpretation was made by going through the steps as follows. (1) Determining the maximum score = number of questionnaire items × number of respondents × 5. (2) Determining the minimum score = number of questionnaire items × number of respondents × 1. (3) Determining the range = maximum score – minimum score. (4) Determining the class width (p) = range ÷ number of categories. (5) The formula used in determining the response scale can be seen in Formula (1).

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30378



…… (1)

(Sundayana, 2014, p. 11)

RESULTS AND DISCUSSION

Results

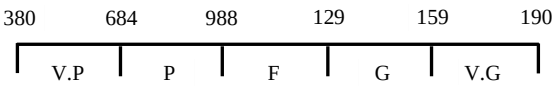
The Effectiveness of Block-system Learning as Viewed from The Teacher Aspect

Table 3 shows that the effectiveness of block-system learning application is viewed from the teacher aspect as a variable at SMK Negeri 1 Warungasem by using asix indicators with 20 statements. The respondents' total score for it is 1693. The interpretation is that it is very high in scale because 380 < 1693 < 1900.

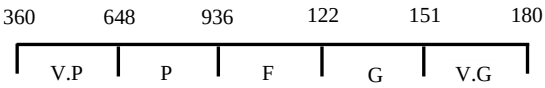
Table 3. Questionnaire Result of Block-System Learning Effectiveness from the Teacher Aspect

Indicator	**Respondents**	
	SMK N 1 Warungasem	**SMK N 1 Blado**
Learning Plan	85	81
	91	80
	84	83
Learning Method	86	81
	86	80
	87	82
Learning Strategy	82	82
	89	81
	81	83
	87	82
Class Management	87	81
	87	82
	84	81
	83	81
Reviewing the Contents of a Course	87	79
	83	80
	83	82
Motivator	84	78
	77	73
	80	76
Value	**1693**	**1608**

SMK Negeri 1 Warungasem



SMK Negeri 1 Blado



Annotation: VP = Very Poor P = Poor F = Fair G = Good VG = Very Good

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30378

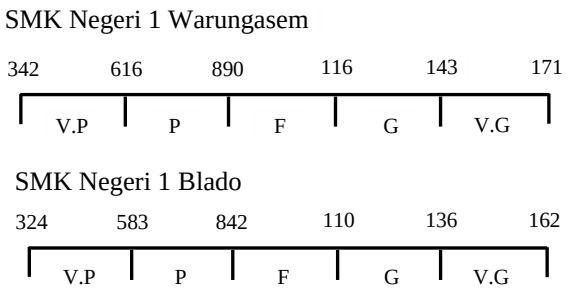
Still, according to Table 3, the effectiveness of the block-system learning application is also viewed from the teacher aspect as a variable at SMK Negeri 1 Blado using six indicators with 20 statements. The respondents' total score for it is 1608. The interpretation is that it is very high in scale because 360 < 1608 < 1800. Data in Table 3 indicate that the application of block-system learning at SMK Negeri in Kabupaten Batang as viewed from the aspect of the teacher's involvement in the process of block-system learning is very good in the degree of effectiveness.

The Effectiveness of Such Learning as Viewed from the Student Aspect

Table 4 shows that the effectiveness of the application of block-system learning is viewed from the student aspect as a variable at SMK Negeri 1 Warungasem by using five indicators with 18 statements. The respondents' total score for it is 1496. The interpretation is that it is very high in scale because 342 < 1496 < 1710.

Table 4. Questionnaire Result of Effectiveness of Such Learning as Viewed from the Student Aspect

Indicator	**Respondents**	
	SMK N 1 Warungasem	**SMK N 1 Blado**
Preparation and Interest	86	80
	85	84
	88	83
	83	85
Students Activity	80	76
	85	80
	77	75
The Role of a Teacher	87	80
	84	80
	81	82
	86	83
Tasks	85	83
	81	78
	84	82
Working Equipment	83	81
	83	74
	77	77
	81	78
Value	**1496**	**1441**



Still, according to Table 4, the effectiveness of the block-system learning application is also viewed from the student aspect as a variable at SMK Negeri 1 Blado using five indicators with 18 statements. The respondents' total score for it is 1441. The interpretation is that it is very high in scale because 324 < 1441 < 1620. From Table 4, it is indicated that the application of block-system learning at SMK Negeri in Kabupaten Batang viewed from the aspect of the students' involvement in the process of block-system learning is very good in the degree of effectiveness.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

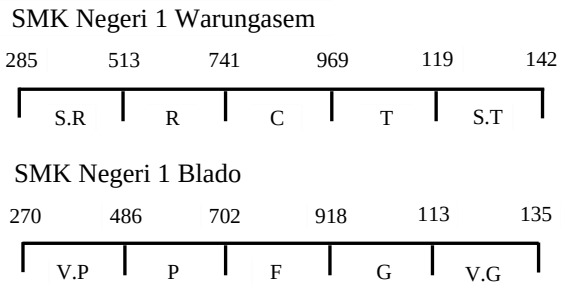
https://doi.org/10.21831/jpv.v10i1.30378

The Effectiveness of Such Learning as Viewed from the Facility and Resource Aspect

Table 5 shows that the effectiveness of the block-system learning application is viewed from the facility and resource aspect as a variable at SMK Negeri 1 Warungasem using five indicators with 15 statements. The respondents' total score for it is 1175. The interpretation is that it is high in scale because 285 < 1175 < 1425.

Table 5. Questionnaire Result of Effectiveness of Such Learning as Viewed from the Facility and Resource Aspect

Indicator	**Respondents**	
	SMK N 1 Warungasem	**SMK N 1 Blado**
Laboratory of Practic	79	77
	81	76
	75	81
Equipmets of Practic	79	80
	78	74
	78	74
Materials of Practic	76	77
	79	75
	80	80
Learning Media	81	81
	75	77
	81	79
Management Practic	75	75
	78	79
	80	81
Value	**1175**	**1166**



Still, according to Table 5, the effectiveness of the application of block-system learning is also viewed from the facility and resource aspect as a variable at SMK Negeri 1 Blado by using five indicators with 15 statements. The respondents' total score for it is 1166. The interpretation is that it is high in scale because 270 < 1166 < 1350.

From the data which are obtained from Table 5, it can be concluded that the application of block-system learning at SMK Negeri in Kabupaten Batang that is viewed from the aspect of the involvement of facilities and also resources in the process of block-system learning is good in the degree of effectiveness. It is in accordance with the result of an interview with the Head of the Department of TKRO at SMK Negeri in Kabupaten Batang, who informs that one of the objectives of applying block-system learning is to bridge a gap due to lack of equipment and materials for students' practice since applying block-system learning gives teachers more ease in running the learning process and, in addition, the application of block-system learning would make students more enthusiastic in indulging in the learning process, because the classes of a productive subject are not scheduled apart from each other and are interspersed with classes of normative or adaptive subjects.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30378

The Students' Learning Achievement After an Application of Such Learning

The data of students' learning achievement after the application of block-system learning in the research are secondary in type. The data are obtained from the results of the students' UKK (*Uji Kompetensi Keahlian* or 'Expertise Competence Test') within the last two years, i.e., the school years of 2017/2018 and 2018/2019. The data are then used to compare the attainment of students' learning achievement in the form of categorization.

SMK Negeri 1 Warungasem

The data of UKK scores for the last two years at SMK Negeri 1 Warungasem can be categorized as presented in Table 6. It can be seen there that a comparison between the students' UKK scores for the 2018 school year, before the application of block-system learning, and their UKK scores for the 2019 school year, after the application of the said learning. It indicates that students who are categorized as being special in score increase from 2 to 4 in number (or from 2.8% to 5.6%), those categorized by the score as meeting the criteria for being very competent increase from 11 to 26 in number (or from 46.43% to 36.1%), and those categorized by the score as meeting the criteria for being competent increase from 38 to 42 in number (or from 15.8% to 58%) while those categorized by the score as meeting the criteria for being fairly competent remain 20 in number (or 1.19%), with there being only one student (or 1.4%) categorized by the score as meeting the criteria for being incompetent. A description of the percentages of students meeting one set of criteria or another in diagram form is presented in Figure 2.

Table 6. Categorization of UKK Value at SMK N 1 Warungasem from 2018 to 2019 School Year

Range	Criteria	Student Number		Percentage (%)	
		2018	2019	2018	2019
X > 91	Special	2	4	2.8%	5.6 %
81 < X ≤ 91	Very Competent	11	26	15.3%	36.1 %
71 < X ≤ 81	Competent	38	42	52.8%	58.3 %
61 < X ≤ 71	Fairly Competent	20	0	27.8%	0 %
X ≤ 61	Incompetent	1	0	1.4%	0 %
Value		**72**	**72**	**100%**	**100%**

(Source: Result of Data Analysis, 2019)

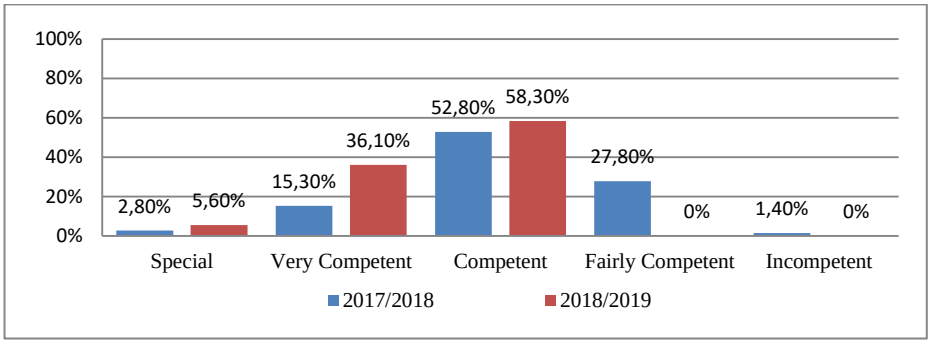


Figure 2. UKK Values Percentage of SMKN 1 Warungasem in the Last Two Years

The block-system learning application at SMK Negeri 1 Warungasem can be said effective in being used for learning and capable of improving students' learning achievement. It can be seen from the increase in the number of students entering the categories of being special and very competent.

SMK Negeri 1 Blado

The data of UKK scores for the last two years at SMK Negeri 1 Blado are categorized as shown in Table 7. It can be seen there that a comparison between the students' UKK scores for the 2018 school year, before the application of the block system, and their UKK scores for the 2019

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30378

school year, after the application of the said system, indicates that students categorized as being special in score increase from 0 to 5 in number (or 0% to 7.1%), those categorized by the score as meeting the criteria for being very competent increase from 14 to 29 in number (or 20% to 41.4%), those categorized by the score as meeting the criteria for being competent increase from 44 to 34 in number (or 62.9% to 48.6%), and those categorized by the score as meeting the criteria for being fairly competent increase from 2 to 12 in number (or 2.9% to 17.1%), with there being no student categorized by the score as meeting the criteria for being incompetent. A description of the percentages of students meeting one set of criteria or another in diagram form is presented in Figure 3.

Table 7. Categorization UKK values of SMKN 1 Blado from 2018 to 2019

Range	Criteria	Student Number		Percentage (%)	
		2018	2019	2018	2019
X > 91	Special	0	5	0%	7.1 %
81 < X ≤ 91	Very Competent	14	29	20%	41.4 %
71 < X ≤ 81	Competent	44	34	62.9%	48.6 %
61 < X ≤ 71	Fairly Competent	12	2	17.1%	2.9 %
X ≤ 61	Incompetent	0	0	0%	0 %
Value		**70**	**70**	**100%**	**100%**

(Source: Result of Data Analysis, 2019)

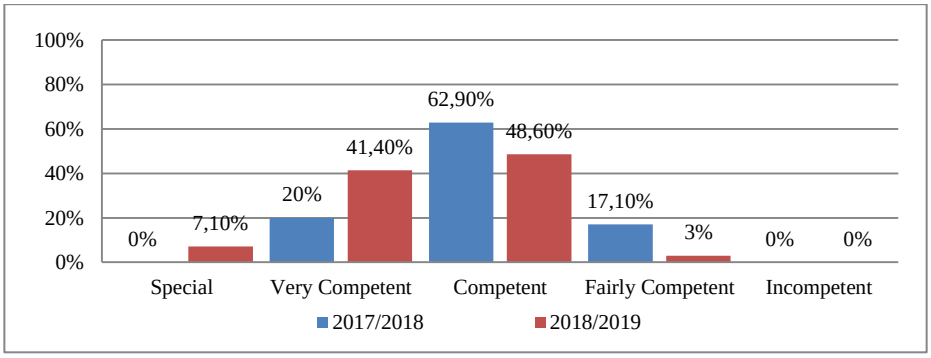


Figure 3. UKK Values Percentage of SMKN 1 Blado in the Last Two Years

It is indicated that the block-system learning application at SMK Negeri 1 Blado can be said effective in being used for learning and capable of improving students' learning achievement. The block-system learning application at SMK Negeri in Kabupaten Batang has made the students' learning achievement better in their UKK mean score than before applying the block-system learning. The supporting data can be seen in the diagram in Figure 4.

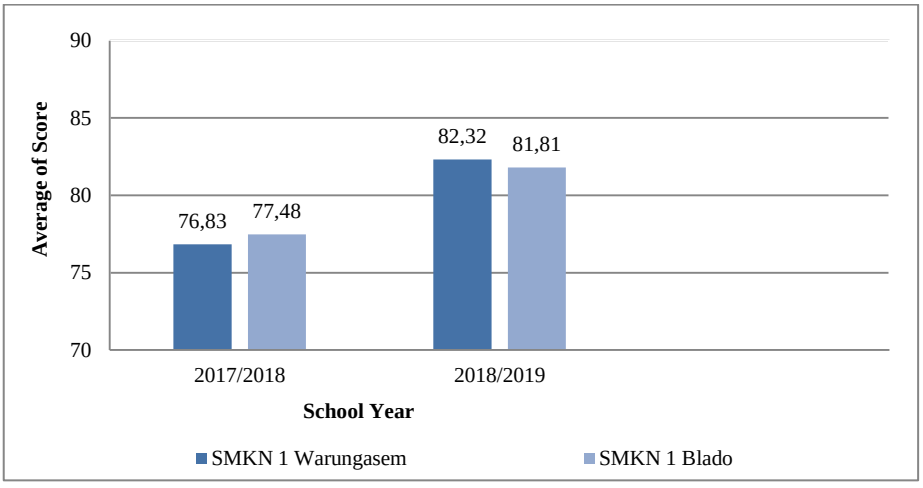


Figure 4. Average Score of Expertise Competency Test (UKK)

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30378

With the diagram in Figure 4 as a basis, it can be seen that, after the application of the block-system learning, there is an increase in students' learning achievement, described as follows: (1) at SMKN 1 Warungasem in the school year of 2017/2018 (i.e., before the application of block-system learning), the students' UKK mean score has been76.83 and, after the application of block-system learning in the school year of 2018/2019, it has undergone an increase into 82.32 and (2) at SMKN 1 Blado in the school year of 2017/2018, the students' UKK mean score has been 77.48 and, after the application in the school year of 2018/2019, it has risen to 81.81. It can be concluded that the application of block-system learning could influence students' learning achievement.

Discussion

Meo (2016, p. 20) explains that learning is said to be effectively conducted if there is a certain difference in learning achievement in relation with such a matter as students' thinking skill after they undergo a learning process within a certain period of time and they feel motivated in the learning process. The same in opinion, Prihartono (2012, p. 37) also explains that effectiveness is interpreted as the degree of success in attaining a goal or target, which is interpreted as the state or condition desired, while efficiency is the best comparison between input and output, more often called the input to output ratio.

The block-system learning application at SMK Negeri in Kabupaten Batang, seen from students' learning achievement and mean score, already meets the KKM value predetermined by the school authorities, i.e., 75.00. That KKM indicator implies that, according to the rule, the predetermined learning objective can be attained. It fits according to the results of documentation concerning UKK scores of the 2018/2019 school year, i.e., at SMK Negeri 1 Warungasem, the UKK mean score rises from 76.83 to 82.32 with a standard deviation of 3.71 and, at SMK Negeri 1 Blado, the UKK mean score rises from 77.48 to 81.81 with a standard deviation of 5.55. Such difference in students' learning achievement, which indicates that, with the application of block-system learning, students' learning achievement could improve, is inseparable from the management of the learning system, the teacher's role in the learning process, students' enthusiasm when participating in the learning process, and the facilities and resources needed during the learning conducted.

The results above indicate that the research concerned is in line with that made by Masbahah et al. (2014) on the effectiveness of block-system learning at SMK in the city of Surabaya. The research results indicate that (1) there is a significant difference in competence between students using the learning with a block system and those using the learning with a non-block system, (2) there is a significant influence of the learning plan in both the learning with a block system and that with a non-block system on students' competence, (3) there is a significant influence of the learning execution in both the learning with a block system and that with a non-block system on students' competence, (4) there is a significant influence of the learning evaluation in both the learning with a block system and that with a non-block system on students' competence, and (5) learning with a block system is higher in effectiveness than that with a non-block system in improving students' competence.

Further, research conducted by Prastiyo et al. (2012) on the application of block-system learning for quality improvement in results of building drawing in Grade XI on the expertise competence in TGB (*Teknik Gambar Bangunan* or 'Building Drawing Engineering') at SMKN 2 Kendal in the school year of 2011/2012 gives results indicating that (1) block-system learning in the Expertise Program of TGB at SMK Negeri 2 Kendal is in implementation categorized good with an average percentage of 87.5% and the condition of the learning is in implementation categorized good with an average percentage of 78.5%, (2) the quality of results in TGB learning through the block system is in implementation categorized good with an average percentage of 70%, (3) students' readiness is categorized good in implementation with an average percentage of 75%, the teacher's readiness is in implementation categorized good with an average percentage of 75%, and the readiness of the school's management is in implementation categorized fairly good with an average percentage of 66.67%, and (4) the block-system learning in the Expertise Program of TGB at SMK Negeri 2 Kendal is in implementation categorized effective with an average percentage of 73.33%.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30378

The research concerned here is also in line with a research conducted by Prasetyo and Yoto (2016) on students' perception toward the effectiveness of learning with the block system in the practice classes at the Department of Mechanical Engineering, Faculty of Engineering, State University of Malang. With results of the data analysis as a basis, the following conclusion can be drawn: (1) the effectiveness as viewed from the learning aspect is high in the category, being 27 in magnitude and 54% in percentage; (2) the effectiveness as viewed from the educator (in this case, university teacher or lecturer) aspect is high in the category, being 31 in magnitude and 62% in percentage; (3) the effectiveness as viewed from the learner (in this case, university student) aspect is high in the category, being 34 in magnitude and 68% in percentage; and (4) the effectiveness as viewed from the equipment/machine aspect is high in the category, being 28 in magnitude and 56% in percentage.

With the results of the research concerned here and the research by some other aforementioned researchers on the application of block-system learning as a basis, it is inferred that the application of block-system learning is effective and could improve students' learning achievement. Therefore, block-system learning is quite right and fitting to be applied to the scope of SMK.

CONCLUSION

The effectiveness of block-system learning at SMK Negeri in Kabupaten Batang, as viewed from the aspect of teacher involvement in the process of block-system learning, is very good in level. At SMK Negeri 1 Warungasem, the total score for it from respondents is 1693. It is interpreted as being very high in scale because $380 < 1693 < 1900$. Likewise, at SMK Negeri 1 Blado, the total score for it from respondents is 1608. It is interpreted as being very high in scale because $360 < 1608 < 1800$.

The effectiveness of block-system learning at SMK Negeri in Kabupaten Batang, as viewed from the student aspect, is very good in level, with indications of students being very highly enthusiastic in attending the learning using the block system. At SMK Negeri 1 Warungasem, the total score for it from respondents is 1496. It is interpreted as being very high in scale because $342 < 1496 < 1710$. Likewise, at SMK Negeri 1 Blado, the total score for it from respondents is 1441. It is interpreted as being very high in scale because $324 < 1441 < 1620$.

The block-system learning at SMK Negeri in Kabupaten Batang, as viewed from the aspect of facilities and resources, has a good degree of effectiveness. At SMK Negeri 1 Warungasem, the total score for it from respondents is 1175. It is interpreted as being high in scale because $285 < 1175 < 1425$. So is the case at SMK Negeri 1 Blado, where the total score for it from respondents is 1166. It is also interpreted as being high in scale because $270 < 1166 < 1350$.

The application of block-system learning in relation to students' learning achievement, as viewed from the UKK score obtained, already meets the KKM value predetermined by the school authorities, i.e., 75.00. At SMK Negeri 1 Warungasem, the UKK mean score of 76.83 in the school year of 2017/2018 rises to 82.32 in the school year of 2018/2019 with an increase of 5.4. Meanwhile, at SMK Negeri 1 Blado, the UKK mean score of 77.48 in the school year of 2017/2018 rises to 81.81 in the school year of 2018/2019 with an increase of 4.3.

REFERENCES

Anderson, H. M., Moore, D. L., Anaya, G., & Bird, E. (2005). Student learning outcomes assessment: A component of program assessment. *American Journal of Pharmaceutical Education, 69*(2), 256–268. https://doi.org/10.5688/aj690239

AsliBatang.com. (n.d.). *Daftar SMK negeri dan swasta di Batang*. AsliBatang.Com. Retrieved March 20, 2019, from https://aslibatang.com/1580/daftar-smk-negeri-dan-swasta-di-batang?amp

Djojonegoro, W. (1998). *Pengembangan sumber daya manusia melalui sekolah menengah kejuruan*. Jayakarta Agung Offset.

Government Regulation No. 17 of 2010 on Educational Management and Implementation, (2010).

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.30378

Government Regulation No. 29 of 1990 on Secondary Education, (1990).

Kyriacou, C. (2009). *Effective teaching in school: Theory and practice*. Nelson Thornes.

LAB Board of Governors. (1998). *Block scheduling: Innovations with time*. LAB at Brown University. https://www.brown.edu/academics/education-alliance/sites/brown.edu.academics.education-alliance/files/publications/block.pdf

Law of Republic of Indonesia No. 20 of 2003 on National Education System, (2003).

Majid, D. A., Mukhadis, A., & Poerwanto, E. E. (2011). Pengaruh model penjadwalan pembelajaran dan motivasi berprestasi terhadap hasil belajar perawatan sepeda motor siswa SMK. *Jurnal Teknologi, Kejuruan, Dan Pengajarannya*, *34*(1), 35–48. https://doi.org/10.17977/tk.v34i1.3020

Masbahah, M., Kustono, D., & Patmanthara, S. (2014). Efektivitas sistem pembelajaran blok di sekolah menengah kejuruan Kota Surabaya. *Jurnal Teknik Mesin*, *22*(1), 57–70. http://journal.um.ac.id/index.php/teknik-mesin/article/view/4488

Meo, S. O. (2016). *Efektifitas discovery learning dan problem learning dalam pembelajaran Geografi ditinjau dari keterapan media elektronik siswa SMA negeri di Ngada Nusa Tenggara Timur*. Master thesis. Universitas Negeri Yogyakarta, Yogyakarta.

Prasetyo, N. Y., & Yoto, Y. (2016). Persepsi mahasiswa terhadap efektivitas pembelajaran dengan sistem blok mata kuliah praktikum pada Jurusan Teknik Mesin Fakultas Teknik Universitas Negeri Malang. *Jurnal Teknik Mesin*, *24*(2), 1–13. http://journal2.um.ac.id/index.php/jurnal-teknik-mesin/article/view/527

Prastiyo, P., Gunawan, H., & Supriyono, B. W. (2012). Implementasi pembelajaran block system sebagai upaya meningkatkan kualitas teknik gambar bangunan kelas XI program keahlian Teknik Gambar Bangunan bidang keahlian Bangunan SMK Negeri 2 Kendal tahun ajaran 2011/2012. *Scaffolding*, *1*(2), 17–27. https://journal.unnes.ac.id/sju/index.php/scaffolding/article/view/2327

Prihartono, P. (2012). *Administrasi, organisasi, dan manajemen: Pendekatan praktis dan teknik mengelola organisasi*. Andi Offset.

Rauner, F., & Maclean, R. (Eds.). (2008). *Handbook of technical and vocational education and training research*. Springer.

Saefuddin, A., & Berdiati, L. (2016). *Pembelajaran efektif*. Rosdakarya.

Setiawan, Y. (2016). *Visi dan misi PSMK*. Direktorat Sekolah Menengah Kejuruan. http://psmk.kemdikbud.go.id/konten/1611/visi-dan-misi-psmk

Sudira, P. (2012). *Filosofi dan teori pendidikan vokasi dan kejuruan*. UNY Press.

Sundayana, R. (2014). *Statistika penelitian pendidikan*. Alfabeta.

Suwati, S. (2008). *Sekolah bukan untuk mencari pekerjaan*. Pustaka Grafika.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

Jurnal Pendidikan Vokasi
Volume 10, No. 1, 2020 (93-102)
Online: http://journal.uny.ac.id/index.php/jpv

JOB SATISFACTION AND PERFORMANCE: A SURVEY STUDY ON INTERNSHIP STUDENTS OF UNIVERSITAS NEGERI MALANG

Rosyidah[1]*, Utami Widiati[1], Andika Agung Sutrisno[1], Ary Fauzi[1], Kukuh Prayitno Subagyo[1], Nurhidayati[1]
[1]Universitas Negeri Malang
Jl. Semarang No.5, Sumbersari, Lowokwaru, Kota Malang, Jawa Timur 65145, Indonesia

Abstract

This study aims to describe the satisfaction of host companies to internship students toward their competencies and performance and suggest improvements to the internship program. The research subjects were students who were undertaking internships in 64 institutions in Malang areas, both in the business and industrial world. Research data are obtained from questionnaires. The results showed that the qualifications of the internship students were in the range of good to very good. These findings are following the expectations of host companies, which also recognize that the competencies of internship students are in line with their expectations and needs. However, some students worked less efficiently, so host companies are not really satisfied. According to the host companies, three things need to be improved: (1) the duration of the internship, (2) monitoring, and (3) student readiness. Regarding the length of the internship, host companies suggest that the internship program's duration occupies at least three months. Host companies hope that the supervisors monitor all students who are apprenticed. Besides, the internship students should prepare in advance by giving them special provisions about the company's product knowledge and related hard skills and soft skills needed in the future jobs. These findings suggest the universities, faculties, students, host companies to develop both of the experiences and satisfaction as possible.

Keywords*: satisfaction of host companies, internship students' performance, student competence*

How to cite: Rosyidah, R., Widiati, U., Sutrisno, A., Fauzi, A., Subagyo, K., & Nurhidayati, N. (2020). Job satisfaction and performance: A survey study on internship students of Universitas Negeri Malang. *Jurnal Pendidikan Vokasi*, *10*(1), 93-102. doi:https://doi.org/10.21831/jpv.v10i1.29874

***Corresponding Author:** Rosyidah rosyidah.fs@um.ac.id
Department of German Literature, Faculty of Letters, Universitas Negeri Malang
Jl. Semarang No.5, Sumbersari, Lowokwaru, Kota Malang, Jawa Timur 65145, Indonesia

https://doi.org/10.21831/jpv.v10i1.29874

INTRODUCTION

One of the main challenges of a university is how to transfer knowledge and expertise to students to be accepted by the business world and industrial world or *Dunia Usaha Dunia Industri* (later called DUDI). For this reason, universities must be able to understand the market needs and accommodate them in programs in the curriculum. In other words, the university must adjust the knowledge transfer process to the demands and needs of the market so that there is no gap with DUDI. Universities must be able to build collaborations with DUDI in various sectors. One form of cooperation is in the way of an internship program.

An internship is a learning process to improve student skills outside the applicable education system, in a relatively short time, with methods that prioritize practice rather than theory (Sari, 2014). Meanwhile, McMahon and Quinn state that an internship is an educational program that provides work experience to students. For that, they must leave campus for a certain period, and they are closely monitored by experienced workers (McMahon & Quinn, 1995). Furco defines an internship as a program that engages students in a job, primarily to provide them with hands-on experience that enhances their learning by understanding relevant problems in a particular field, the process of learning from an expert through real-world activities (Furco, 1996). Based on the three definitions above, it can be concluded that internships provide significant benefits for students because they can provide the experience that shapes students' personalities and has the professional expertise, quality, and able to develop along with their fields. Internships have an increasingly important role in education because they provide several benefits for students, including work experiences, job-related guidance, and networking with students from various other institutions where they carry out internships (Bukaliya, 2012). Meanwhile, according to Mgaya and Mbekomize, the internship program benefits not only for the students but also for the universities and the host companies (Mgaya & Mbekomize, 2014).

Therefore, an internship program is compulsory in the curriculum of an undergraduate program in which the purpose is to prepare students to become professional human resources and ready for work. It is understandable since the internship is mostly giving experiences to exposure to real work. Internships also become very popular among employers, employees, and universities worldwide (Holyoak, 2013). For students, an internship is an opportunity to gain work-related experience and apply their knowledge in a professional work environment (Renganathan et al., 2012). Meanwhile, employers have stressed the importance of work experience in the recruitment process (D'Abate et al., 2009). Therefore, according to D'Abate et al., universities have to maintain the apprenticeship programs since it is needed to bridge the gap between the theory and practice.

The demand for internships is increasing because internships are believed to improve students' working skills and contribute to society. By the increasing demand for internships, universities must be able to prepare the readiness of students who carry out internships so that their performance during the internship can meet the partner institutions' expectations. These performances refer to the quality improvement of the students' hard skills and soft skills.

The implementation of an internship program in the Faculty of Letter or *Fakultas Sastra* (later called FS) Universitas Negeri Malang (later called UM) is integrated into the PKL-(Work Practice) course with a load of 4 credits. By doing the internship program, the students are likely to deepen their understanding of the theoretical knowledge and its practical application in the field; the internship students will also learn about their communities and real work situations. These experiences allow them to build the professional networks and partnerships which needed. For this purpose, FS UM cooperates with agencies, both private DUDI and the government institutions. The host institutions give the students practical skills during the internship program for about 1-2 months to build the intensive interaction between students and the host institutions.

The internship program is one of the compulsory courses in FS UM. The internship activities include the preparation and training, the implementation, and the monitoring and evaluation of the internship implementation. This activity is expected to be able to establish students' professional competencies. For the internship program's sustainability, the departments/study programs need to carry out monitoring and evaluation sessions regularly. At the end of the internship program, the advisor lecturers do a monitor and evaluation session. The lecturers monitor and evaluate the in-

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29874

ternship students' progress by using the assessment sheets developed by each study program/ department. The purpose of doing this is because the lecturer can find solutions if there are problems in the implementation of the internship. The lecturer asks the students about the attendance, the internship plan, questions, and general impression of the internship. However, this monitoring and evaluation session of the internship program does not involve host institutions. Furthermore, to provide more objective results of the internship program, host institutions/ companies should share information related to internship students' performance. It means that the monitoring and evaluation session needs to involve the host organization's satisfaction indicators.

Satisfaction can be interpreted as feeling happy or disappointed in someone as a result of the comparison between the performance that is shown and the expectation. In the context of this study, satisfaction is a condition when the needs, desires, and expectations of DUDI as the host organization can be met through the performance of students who carry out an internship. The research on the internship program's satisfaction aims to obtain information about the quality and performance of the internship program seen from the host institutions' point of view, whether the performance has been as expected.

Research on DUDI's satisfaction with student internships' performance has indeed been carried out, including a study conducted by Sari, involving government agencies (Sari, 2014). Meanwhile, Widyastuti and Fattah's research was conducted by the ITS research team, and the research subjects were ITS graduates in 2016, involving DUDI (Widyastuti & Fattah, 2016).

However, similar research for students at FS UM has never been done. Based on those aforementioned references, this study differs from previous research, although it also studied user satisfaction internship problems. The subject of this research is students who are conducting an apprentice 2019 from the Department of English, Department of Indonesian, Department of German, and Department of Art and Design, who did an internship on DUDI.

RESEARCH METHOD

This research employs a descriptive study with a qualitative approach that aims to describe student internships' performance and find out things that need to be improved in the student internship program. This research data were in the form of DUDI's opinion/statement about their satisfaction with the performance of internship students and was obtained through human instruments with supporting instruments in the form of qualitative questionnaires (Eckerdal & Hagström, 2016). The research's focus is two types of research data, namely (1) performance data of internship students and (2) data on things that need to be improved in student internship programs. The researchers analyzed the data findings by following the steps of qualitative data analysis: data reduction, data display, conclusion, and verification (Sugiyono, 2011).

RESULTS AND DISCUSSION

Internship Performance

Performance is a result of work achieved by a person in carrying out the tasks assigned following a predetermined time and goals or objectives that have been set (Sianturi & Mulyadi, 2019). The data analysis results show that some of the internship partner institutions infer that the internship students' performance is already good and excellent. The internship students had developed their abilities, skills, personality performance, and professional performance.

Quality of Work

The quality of performance is the quality that must be done (good or bad). If it is measured qualitatively, it reflects the "level of satisfaction," namely how good the results are. The quality performance of an employee, including the performance of interns students, is one of the factors that influence the company's success in achieving its goals. If the quality of employee performance is low, the company could not achieve the specified target. Table 1 presents an example of company statements that the variety of student internships is both good and very good.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29874

Table 1. Quality of Work with the Predicate 'Good'

No	Host Company	Comment
1.	Terakota.id	The performance of students is already good, as expected
2.	Kapanlagi.com	The work is good, and it fulfills the expectations
3.	Kusuma Satria	The result is satisfied
4.	Air Asia Travel Service	The work result of the interns' students here is good

Table 1 shows the four examples, and it explicitly states that the internship students' performance is good. This shows that DUDI is satisfied with the performance of students. Meanwhile, there were also very good results, as shown in the examples in Table 2.

Table 2. Quality of Work with the Predicate 'Excellent'

No	Host Company	Comment
1.	Radio Elfara	Because it is matched with the field, Firda'swork is very good
2.	PT Malang Intermedia	Their supporting design isvery good
3.	ORKHA	Their works are excellent
4.	Tugu Hotel Malang	The interns' students' work is impressive

As seen in Table 2, it can be inferred that DUDI, who also stated explicitly that the work of interns students from the FS UM was very good, and they are very satisfied with their performance. It can be inferred, the good/very good performance of the interns' students is beneficial for them when they enter the world of work in the future (Lima et al., 2014). Based on the description, it can be concluded that the internships student's quality work is in the range of good and very good. The quality of the work is in line with DUDI's expectations.

Work Efficiency

Work efficiency refers to the definition of work efficiency provided by the Indonesian online dictionary, that is the ability to carry out tasks adequately and appropriately without wasting time, energy, costs, and carrying out work in specific ways without reducing predetermined goals (Raziq & Maulabakhsh, 2015). The data analysis results show that there were a small number of students who work less efficiently. The statements of DUDI related to this efficiency are shown in Table 3.

Table 3. Work Efficiency

No	Host Company	Comment
1.	PT Malang Intermedia	Internship students must be responsive to work and discipline
2.	IRDH CV	Students must use efficient methods at work
3.	Terakota.id	Students must be competent, creative, and discipline

Table 3 reveals that some students who did the internship at the host companies work inefficiently. The words or phrases *responsive, discipline, capable, and creative* are words/phrases that are commonly used to describe the way or procedures of an employee's work. An employee is expected to complete the work within a limited time, and it indicates that the employee not only needs to increase the speed of the work but also needs to keep the quality of the work (Raziq & Maulabakhsh, 2015). Therefore, inefficient internship students lack time to complete their work, while efficient internship students feel that they lack the task to spend their time.

Based on those descriptions, it can be concluded that there were a small number of internship students who work less efficiently. This is not in line with DUDI's expectations.

Job Competence

The work competency is the workability of a person that includes the aspects of knowledge, skills, and work attitudes that are following the standards set (Sumendap et al., 2015) and Law of Republic of Indonesia No. 13 of 2003 on Manpower. Regarding work competence, most companies stated that internship students from FS UM had mastered the task material they had to do. Table 4 shows some examples of DUDI statements in this regard.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29874

Table 4. Work Competencies

No	Host Company	Comment
1.	ORKHA	Student interns help to run the company's processes
2.	Wisma Jerman	The mastery of the material is good
3.	Translationlinker	The basic and theoretical knowledge are good
4.	PT Malang Intermedia	Their knowledge is good and its applicable here
5.	Radio Elfara	Field-controlled and used here

Based on Table 4, the competence of internship students is good. Besides, DUDI also stated that they needed these work competencies. The work competence for employers, among others, is to improve the efficiency and the effectiveness in the industry, to increase business competition in the industrial world, and as a predictor of employee's job success. Employees who are professional and have competencies can handle problems and varied range of the issues related to different fields of knowledge and develop them (Lima et al., 2014). For students who do internships, competencies are determinants of their success in getting a job and pursuing a career soon after they graduate.

Some host institutions are satisfied with the competence of the internship students. As stated in the definition, satisfaction refers to feeling happy or disappointed because someone's expectations of something are fulfilled or not. In the context of this study, the achievement is related to the feelings of pleasure or disappointment that is experienced and felt by DUDI on the performance of the internship students after comparing the results of the internship performance with their expectations.

The results show that DUDI is satisfied with the internship students in the 2018/2019 academic year. In this case, DUDI's satisfaction with the internship students' performance can be seen from the general statements given by DUDI related to their experience guiding the students. The experience of supervising interns from the faculty level impressive for all DUDI institutions involved. It means the performance of the internship raises a positive feeling or gives a good impression to DUDI. The tracing of student appraisal documents shows that generally, DUDI has a good impact on the discipline, initiative, accuracy, and cooperation demonstrated by the students. For these four aspects, the majority of students received an average grade of 90 or in a category of *excellent*.

In other words, during internships at the host companies, the performances of students, whereby performance standards, work procedures, code of ethics, and generally applicable organizational regulations. Thus, it can be concluded that the results of the internship students have shown conformity with the expectations of DUDI.

Suggestions

The results show that although the internship students were considered good, there were essential things that had to be corrected immediately by policymakers at the university level. The things that need to be improved from the program are the duration of the internship, the internship's monitoring, and the readiness of the students to take part in the internship. In details, these three things are explained in as follows.

Internship Duration

The students carry out apprenticeship programs in various DUDI institutions, which are partners for four weeks. According to most partner institutions, the duration of the internship is inadequate and needs to be extended. Table 5 shows the examples of data related to the need to increase the length of the internship.

Table 5. Apprenticeship Duration

No	Host Company	Comment
1.	Hi Animation	Add the minimum duration of the internship program
2.	PT Aice Ice Cream	Extend the internship time
3.	Wisma Jerman	The duration of the internship should be extended

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29874

Table 5 points to the fact that the duration of the student internship, which is four weeks, is not ideal for DUDI. According to Bukaliya, the perfect length of an internship is six months, because in general, people work long-term to learn skills, gain valuable experience, or to pursue a career seriously (Bukaliya, 2012). Meanwhile, in several universities, both in the domestic area and abroad, student internships' duration varies between one to six months. For example, at Universitas Padjadjaran Bandung, students carry out internships at SOEs for six months, while at Universitas Indonesia Jakarta, students can carry out internships for at least one month. Abroad, as in Germany, students generally carry out compulsory internships/practical work for five to six months, while the duration of internships that are not mandatory is at least six months, and some are even seven months (Seitter, 2009). With the length of the internship, students can learn and gain experience in their chosen field. Within the internship's ideal duration, the apprentice can make a good decision, whether to continue working in the industry or do other things that might be more suitable. In other words, if the apprenticeship time is less than ideal, it is feared that students will not be able to learn many things in depth even if they work every day, gain less valuable experience, and subsequently make wrong decisions for their future.

The internship duration, especially at the tertiary level, can be adjusted to the schedule of student academic activities (Briel & Getzel, 2001). For this reason, the internship program, including the duration of the internship, can be designed and prepared according to the academic calendar at the relevant tertiary institution. However, the ideal period of apprenticeship is a period that allows interns to complete worthwhile projects for intern students and employers. It must also be able to bring students into the rhythm of the work, creating a more realistic experience. For this reason, an internship duration of three to four months with 20-35 hours per week is considered ideal.

Internship Monitoring

Internship monitoring is part of the internship program that faculty must carry out to monitor all students who are conducting internships in various host agencies. Through internship monitoring, communication is expected to occur regarding issues related to apprenticeship between FS UM with the interns' students and with the host institutions. The FS usually monitors internship activities by sending lecturers and collaborating with internship instructors/supervisors from DUDI.

The results showed that this did not work as it should be. Some DUDI institutions state directly and indirectly that the FS lecturer did not monitor some interns' students at their location. This means that FS has no lecturers to monitor the implementation of internships in several locations during the internship program. Table 6 shows an example of a statement from DUDI's institution regarding matters that must be improved.

Table 6. Internship Monitoring

No	Host Company	Comment
1.	Terakota.id	Need control from the campus for students' activity directly
2.	IRDH CV	There must be a lecturer visit
3.	ORKHA	There must be a regular monitoring
4.	MTIC	PKL lecturers must visit
5.	24 Slides	Lecturers supervisor should have the time to pay a visit to the host company

Table 6 reveals that the internship students in these host companies did not receive a monitoring visit from the supervisor. Monitoring should be carried out by the lecturers periodically during the internship program. With regular monitoring activities, it is expected that the supervisor can help to find solutions for all the difficulties and problems experienced by the student participants. However, monitoring can be carried out by the supervisor at least once during the internship program. Control can be done indirectly through electronic media (Juradin, 2018). However, direct monitoring is still considered more effective because by making visits to the internship, the lecturers can see the activities and problems of the students directly, communicate and find solutions with the mentor/instructor intern from the host companies. By monitoring, internships can provide professional and precious work experience for students (Kramer-Simpson, 2018).

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29874

Students' Readiness

In this study, students' readiness refers to the willingness to carry out the internships program. It is essential to have readiness as a reference for graduation in this program. Besides, in the era of technology and globalization, DUDI requires its workforce to have high abilities and strong personalities. Students as prospective workers need to have the readiness to meet the DUDI's demands. Thus, work readiness is very beneficial for every student who is an internship and also profitable for DUDI institutions. However, each student has a different level of work readiness.

In general, students' readiness to carry out an internship program is the overall condition of students who make themselves ready to enter the workforce. Thus, internship students should be able to carry out certain activities concerning work. Agusta (2014) states that work readiness is the capacity of a person to improve his workability consisting of science and expertise and attitudes. Based on this description, students' readiness for internships must include the willingness of science, the readiness of expertise, and the readiness for attitude. The results show that according to some DUDI institutions, some FS students are not ready for work, still need to be prepared as well as possible before carrying out an internship. Table 7 shows examples of statements from DUDI institutions leaders regarding the work readiness of FS UM students currently doing an internship.

Table 7. Student Readiness

No	Host Company	Comment
1.	Translationlinker	Need more prepared briefing and more practical
2.	PT. Malang Intermedia	Internship students must understand the product knowledge of the company
3.	Terakota.id	Equipping students with soft-skills that are suitable with the industry world

Based on Table 7, the work readiness of FS UM students is considered to be lacking in terms of knowing practical abilities, understanding the company's product knowledge, and mastering soft skills. Practical skills are usually called hard skills, the primary skills needed in a job, including science, technology, and technical skills related to the field of science (*Pentingnya "hardskill" dan "softskill" dalam dunia karir*, 2018). Meanwhile, non-technical abilities are known as soft skills, the abilities or qualifications to deal with others and themselves. Thus, soft skills encompass interpersonal skills, personal skills and refer to values, motivation, behavior, character, habits, and attitudes. Abilities and skills needed by companies are not only in the form of hard skills but also soft skills. This was also conveyed by Rahayu and Anna (2013) that the criteria for quality human resources can be seen from the balance between soft skills and hard skills. Hard skills refer to academic skills, science, and technology. Meanwhile, soft skills are skills that refer to things non-academic and non-technical, intrapersonal, and interpersonal. Soft skills can be seen, among others, from the way a person designs his future, his motivation, building his confidence, his way of communicating, his character, and his leadership. According to Al Abduwani (2012), a combination of hard skills and soft skills possessed by an employee, including an intern is very necessary in the world of work. The soft skills can help an employee to get along quickly in the work environment because honesty, a sense of responsibility, discipline, self-confidence that a person has naturally makes it easy for the person to be accepted into the work environment. Indirectly, soft skills can also help the person develop hard skills they have; for example, people with strong motivation to achieve an ideal strive to master various hard skills as demanded.

Understanding of product knowledge is the understanding of consumers about a product that can influence purchasing decisions (Indriani & Suharyono, 2017). This is an essential requirement in business to compete and gain customer satisfaction. The skill of understanding the company's product knowledge is a must for every employee, including the intern students. Lack of knowledge of the company's product marketing strategy is one aspect of poor service. In other words, internship students who lack knowledge about the strengths or the weaknesses of the company's products cannot provide the best service. The company's customers also feel that the student is incompetent because they cannot offer the best solutions and appropriate suggestions for the customers in using company products.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29874

The internship students who lack work readiness seem not to understand what to do and what tasks they need to complete immediately. This situation makes the intern students look passive, less responsive, and not proactive in the internship activities. This can affect the performance of the students when they enter the real world of work. Thus, students' work readiness needs to be possessed as early as possible and before coming into the real world of work. It is also to ease the burden of DUDI in establishing human resources. Work readiness means the ability, skills, and work attitudes that are appropriate to the demands of the community/DUDI and following the potential possessed by students in various types of specific jobs that can be directly applied.

CONCLUSION

Based on the focus results of the study, two conclusions are presented. First, in general, DUDI is satisfied with FS UM students' performance who join the internship program in the 2018/ 2019 academic year. During the internships program, the host institutions gave the comment on the quality of work of FS UM student internships wherein the range of predicate *good* and *excellent*. This is following DUDI's expectations, which also recognizes that the work competency of internship students from FS UM is in line with expectations, and the DUDI requires those work competencies. However, some intern students work less efficiently, so DUDI is not satisfied with this.

Second, to improve the internship program of FS UM students, there are three things that are needed to be improved, namely the length of the internship, monitoring and evaluating session, and work readiness of students. Regarding the length of the internship, DUDI hopes that the internship duration of at least three months can be fulfilled by the FS UM. DUDI also hopes that FS UM monitors all students who are apprenticed through the visit of their supervisor. In addition, interns need to be prepared in advance with a special briefing; for example, given on product knowledge of the company, the things that are closely related to the hard skills and soft skills needed for jobs.

ACKNOWLEDGMENT

The authors express their profound gratitude to the Faculty of Letters and Lembaga Penelitian dan Pengabdian kepada Masyarakat (LP2M) Universitas Negeri Malang for funding this research under Grant 5.8 /UN32.14/KP/2019.

REFERENCES

Agusta, Y. N. (2014). Hubungan antara orientasi masa depan dan daya juang terhadap kesiapan kerja pada mahasiswa tingkat akhir Fakultas Ilmu Sosial dan Ilmu Politik di Universitas Mulawarman. *PSIKOBORNEO: Jurnal Ilmiah Psikologi*, *2*(3), 133–140. http://e-journals.unmul.ac.id/index.php/psikoneo/article/view/3653

Al Abduwani, T. A. R. (2012). *The value and development of soft skills: The case for Sultanate of Oman*. LAP - LAMBERT Academic Publishing.

Briel, L., & Getzel, E. (2001). Internships in higher education: Promoting success for students with disabilities. *Disability Studies Quarterly*, *21*(1). https://doi.org/10.18061/dsq.v21i1.254

Bukaliya, R. (2012). The potential benefits and challenges of internship programmes in an ODL institution: A case for the Zimbabwe Open University. *International Journal on New Trends in Education and Their Implications*, *3*(1), 118–133.

D'Abate, C. P., Youndt, M. A., & Wenzel, K. E. (2009). Making the most of an internship: An empirical study of internship satisfaction. *Academy of Management Learning & Education*, *8*(4), 527–539. https://doi.org/10.5465/AMLE.2009.47785471

Eckerdal, J. R., & Hagström, C. (2016). Qualitative questionnaires as a method for information studies research. *Proceedings of the Ninth International Conference on Conceptions of Library and Information Science*. http://informationr.net/ir/22-1/colis/colis1639.html

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29874

Furco, A. (1996). Service-learning and school-to-work: Making the connections. *Service Learning, General*, *32*(1), 7–14.

Holyoak, L. (2013). Are all internships beneficial learning experiences? An exploratory study. *Education + Training*, *55*(6), 573–583. https://doi.org/10.1108/ET-02-2012-0024

Indriani, R. S., & Suharyono, S. (2017). Program Product Knowledge sebagai strategi pemasaran dan pengaruhnya terhadap penjualan (Studi kasus produk S-Tee PT. Sinar Sosro kantor penjualan wilayah Jawa Timur). *Jurnal Administrasi Bisnis*, *47*(2), 187–192. http://administrasibisnis.studentjournal.ub.ac.id/index.php/jab/article/view/1858

Juradin, J. (2018). *Sistem informasi monitoring praktek kerja industri berbasis web*. Undergraduate thesis. Universitas Negeri Makassar, Makassar.

Kramer-Simpson, E. (2018). Moving from student to professional: Industry mentors and academic internship coordinators supporting intern learning in the workplace. *Journal of Technical Writing and Communication*, *48*(1), 81–103. https://doi.org/10.1177/0047281616646753

Law of Republic of Indonesia No. 13 of 2003 on Manpower, (2003).

Lima, R. M., Mesquita, D., & Flores, M. A. (2014). Project approaches in interaction with industry for the development of professional competences. In Y. Guan & H. Liao (Eds.), *Proceedings of the 2014 Industrial and Systems Engineering Research Conference (ISERC 2014)* (pp. 1668–1677).

McMahon, U., & Quinn, U. (1995). Maximizing the hospitality management student work placement experience: A case study. *Education + Training*, *37*(4), 13–17. https://doi.org/10.1108/00400919510088870

Mgaya, K., & Mbekomize, C. (2014). Benefits to host organizations from participating in internship programs in Botswana. *Asia-Pacific Journal of Cooperative Education*, *15*(2), 129–144.

Pentingnya "hardskill" dan "softskill" dalam dunia karir. (2018). Kompasiana.Com. https://www.kompasiana.com/jonithunder/5bf23690ab12ae448c353bb4/pentingnya-hardskill-dan-softskill-dalam-dunia-karir

Rahayu, S., & Anna, Y. D. (2013). Soft skills attribute analysis in accounting degree for banking. *International Journal of Business, Economics and Law*, *2*(1), 115–120. http://ijbel.com/wp-content/uploads/2014/06/Soft-Skills-Attribute-Analysis-In-Accounting-Degree-For-Banking-Sri-Rahayu-Yane-Devi-Anna.pdf

Raziq, A., & Maulabakhsh, R. (2015). Impact of working environment on job satisfaction. *Procedia Economics and Finance*, *23*, 717–725. https://doi.org/10.1016/S2212-5671(15)00524-9

Renganathan, S., Ambri Bin Abdul Karim, Z., & Su Li, C. (2012). Students' perception of industrial internship programme. *Education + Training*, *54*(2/3), 180–191. https://doi.org/10.1108/00400911211210288

Sari, B. L. (2014). *Studi kepuasan pengguna magang mahasiswa Pendidikan Ekonomi bkk Pendidikan Administrasi Perkantoran Fakultas Keguruan dan Ilmu Pendidikan Universitas Sebelas Maret tahun 2014* [Undergraduate thesis. Universitas Sebelas Maret]. https://digilib.uns.ac.id/dokumen/detail/41906/Studi-Kepuasan-Pengguna-Magang-Mahasiswa-Pendidikan-Ekonomi-Bkk-Pendidikan-Administrasi-Perkantoran-Fakultas-Keguruan-Dan-Ilmu-Pendidikan-Universitas-Sebelas-Maret-Tahun-2014

Seitter, W. (2009). *Professionalitätsentwicklung in der weiterbildung* (W. Seitter (Ed.)). VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-531-91765-8

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29874

Sianturi, P. F. R., & Mulyadi, H. (2019). Pengaruh pelatihan dan motivasi kerja terhadap kinerja karyawan pada karyawan divisi produksi PT Indo-Extrusions-Cimahi. *Journal of Business Management Education (JBME)*, *2*(2), 259–268. https://doi.org/10.17509/jbme.v2i2.2295

Sugiyono, S. (2011). *Metode penelitian pendidikan pendekatan kuantitatif, kualitatif, dan R&D*. Alfabeta.

Sumendap, J., Mandey, J., & Mambo, R. (2015). Pentingnya kompetensi kerja dalam meningkatkan kinerja Pegawai Negeri Sipil di Biro Umum dan Keuangan Universitas Sam Ratulangi Manado. *Jurnal Administrasi Publik*, *4*(32). https://ejournal.unsrat.ac.id/index.php/JAP/article/view/9900

Widyastuti, W., & Fattah, A. H. (2016). *Laporan survey kepuasan pengguna lulusan ITS tahun 2016*. Institut Teknologi Sepuluh Nopember.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

Jurnal Pendidikan Vokasi
Volume 10, No. 1, 2020 (103-113)
Online: http://journal.uny.ac.id/index.php/jpv

THE PRAXIS OF PROJECT-BASED LEARNING AT PIKA VOCATIONAL SECONDARY SCHOOL SEMARANG

Wahyu Noviansyah[1]*, Putu Sudira[2]
[1]Universitas Sebelas Maret
Jl. Jend. Ahmad Yani 200A, Pabelan, Kartasura, Sukoharjo 57100, Indonesia
[2]Universitas Negeri Yogyakarta
Jl. Colombo No. 1, Karangmalang, Depok, Sleman, Yogyakarta 55281, Indonesia

Abstract

This study aims to find out the praxis of project-based learning at PIKA Vocational Secondary School Semarang and to identify the advantages and disadvantages. The design of this research is a qualitative case study. The data collection techniques were in-depth interviews, participant observation, and document analysis. The informants of this study were: principal, vice-principal, teachers, employees, and students. This study shows that: (1) there are two patterns of project-based learning at PIKA VSS Semarang. The first pattern is an internal internship program, and the second is learning a productive practice program. (2) The advantages of project-based learning are: (a) it trains the students' sense of entrepreneurship; (b) it develops learning motivation; (c) it gives a complete, real and contextual learning experience; and (d) it develops the students' hard skills and soft skills. The disadvantages of project-based learning are: (a) it requires the acquisition competencies to perform project assignments; (b) it takes times; (c) it requires high operational costs; (d) it requires adequate facilities.

Keywords*: project-based learning, PIKA vocational secondary school, learning praxis*

How to cite: Noviansyah, W., & Sudira, P. (2020). The praxis of project-based learning at PIKA Vocational Secondary School Semarang. *Jurnal Pendidikan Vokasi*, *10*(1), 103-113. doi:https://doi.org/10.21831/jpv.v10i1.29032

***Corresponding Author:** Wahyu Noviansyah wahyunoviansyah@staff.uns.ac.id
Department of Building Engineering Education,
Faculty of Teacher Training and Education,
Universitas Sebelas Maret
Jl. Jend. Ahmad Yani 200A, Pabelan, Kartasura,
Sukoharjo 57100, Indonesia

https://doi.org/10.21831/jpv.v10i1.29032

INTRODUCTION

The impact of technological and information development in the 21st century dramatically affects changes in the way of life, learning, work, and even ways of thinking at work (Boutin et al., 2009). Unpredictable changes in the 21st-century workplace should become the attention of Vocational Secondary School (VSS) to equip students with 21st-century skills. It is necessary for VSS graduates to be absorbed in the labor market and to be adaptive rather than anticipatory to the changes in their workplace, both for the current and future contexts. The 21st-century skills include verbal and written communication skills, critical thinking in problem-solving, professionalism and ethics in the workplace, teamwork, technological skills, leadership skills, and project management (Trilling & Fadel, 2009).

This expectation has not been fully achieved. The facts show that VSS has not yet succeeded in overcoming the problem of unemployment in Indonesia. The empirical phenomenon shows that some Vocational Secondary School (VSS) graduates have not been able to be absorbed in the job market because their competence is not in accordance with the demands of the work field (Trianto, 2014). The data from the Central Bureau of Statistics quoted from Ulya (2019) in Kompas.com, November 5, 2019, the open unemployment rate is dominated by VSS Graduates grew 10.42% in 2019. The education sector becomes the thing that contributes the most to the amount of unemployment in Indonesia.

The issue of unemployed vocational graduates reported is contradictory to the phenomena that occurred in PIKA VSS Semarang. VSS PIKA Semarang is one of the vocational education institutions that is consistent in producing qualified, skilled, and competitive graduates in the field of furniture engineering. PIKA VSS is able to produce highly qualified human resources to make graduates able to be absorbed in the job market. Almost none of the PIKA VSS graduates are unemployed. The study from Setiawaty (2013) shows that the teaching and learning at PIKA VSS produce graduates with competence, ready to work, and fulfill the industrial needs in global competition. They are either absorbed in the work field and able to do the entrepreneurship (Adriyanto, 2012). Based on the empirical study in the field, it was found that: (a) PIKA VSS graduates were able to be absorbed in the job market due to their superior competences; (b) PIKA VSS graduates have the readiness to work in the wood industry; (c) every year many industries apply for the workforce and do direct recruitment from PIKA VSS (Sugestiyadi, 2012). Based on the PIKA VSS internship program report in 2017, 20 companies from various regions come to recruit apprentice students. The list of the companies can be seen in Table 1.

Table 1. List of Internship Partner Companies PIKA VSS Semarang

No.	Companies	Regional Address
1.	PT. Kudos Istana Furniture	Kudus, Central Java
2.	PT. Horrison & Gill	Semarang, Central Java
3.	PT. Deka Sari Perkasa	Bekasi, West Java
4.	PT. Agape Terang Mulia	Tebet, Jakarta
5.	PT. International Furniture Industries	Cakung, Jakarta
6.	PT. Cipta Kreasi Wood Industry	Karawang, West Java
7.	PT. Erka Interindo	Pulogadung, Jakarta
8.	PT. Integra Indocabinet	Sidoarjo, East Java
9.	Yayasan Mulia Bakti	Purwokerto, Central Java
10.	PT. Marrie Albert	Semarang, Central Java
11.	PT. Mamagreen Pacific	Semarang, Central Java
12.	PT. Jatiluhur Agung	Semarang, Central Java
13.	PT. Semeru Karya Buana	Semarang, Central Java
14.	PT. Kayu Lapis Indonesia	Semarang, Central Java
15.	CV. Mebel Internasional	Semarang, Central Java
16.	PT. Satya Mas	Kuningan, Jakarta
17.	PT. Antex Jaya Exim	Semarang, Central Java
18.	PT. Alegra Living	Semarang, Central Java
19.	PT. Danwood	Semarang, Central Java
20.	PT. Kajia Jawa Manufacturing	Klaten, Central Java

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29032

The data provide an overview of the quality owned by PIKA Vocational Secondary School Semarang. Wood industries across regions in Indonesia have known the PIKA VSS. The companies came to recruit students as workers. The internship program coordinator had said that three of these 20 companies belong to PIKA VSS Semarang. That fact proves that the success of PIKA Vocational Secondary School in educating its graduates to become entrepreneurs who master their work field expertise.

Another fact that can indicate that PIKA VSS is considered successful in forming its students skilled in the field of the wood industry can be seen through the students' achievement record in various competitions. PIKA VSS has achieved outstanding achievements in every skill competition from year to year, both at national and regional, even at the international level (Berita Jateng, 2015). The performance record ever achieved by PIKA VSS in various skill competitions is presented in Table 2.

Table 2. Achievement Record of PIKA VSS Semarang

No.	Competition	Year	Achievement
1.	Asean Skill Competition (ASC) in Malaysia	2016	Gold Medal Cabinet Making
2.	World Skill Competition (WSC) in Brazil	2015	Medallion for Excellence Joinery
3.	Asean Skill Competition (ASC) in Vietnam	2014	Gold Medal Joinery, Silver Medal Cabinet Making
4.	Nasional Competency Competition	2013	First rank on Joinery
5.	Asean Skill Competition (ASC) in Indonesia	2012	Gold Medal Joinery, Silver Medal Joinery, Silver Medal Cabinet Making

The PIKA VSS excellence in producing quality graduates cannot be separated from the process of organized learning. The learning at PIKA VSS is able to produce competent, accomplished, ready to work, and global competitiveness output (Setiawaty, 2013). The documentation of the PIKA VSS profile indicates that one of the patterns applied to learning at PIKA VSS is a project-based learning model. Project-based learning at PIKA VSS is done by providing project work to students to create a furniture product. The learning pattern provides an opportunity for students to complete project work autonomously. The implementation of project-based learning at PIKA VSS as the actualization of the teaching-based system of the education industry is done to present the real situation of the industry in the learning process. Learning through real working practices can improve student work competence (Pancawati & Sukardi, 2017).

Project-based learning is a learning model that provides an opportunity for students to produce valuable and realistic, and contextual work (Trianto, 2014). Project-based learning includes an interesting and innovative learning model in which students choose various aspects of the task and are motivated through real problems in many cases, thus contributing to the environment (Bender, 2012). Thus, project-based learning is a learning model consisting of complex tasks that are realistic-contextual by engaging students in project activities and producing valuable products.

The research evidence shows that the project learning model is successful in building deeper understanding and a higher level of motivation and at developing the 21st-century skill (Trilling & Fadel, 2009, p. 107). That is because of several things. First, the project learning model can help students deeper understand because they can apply the knowledge to real-world problems. Second, project learning will assist students in improving performance because project completion requires active and collaboration. Indirectly also form the skills to work together. Third, learning can be successful because students are taught how to learn as well as what to learn (Larmer et al., 2015; Mulyadi, 2016; Trilling & Fadel, 2009).

Project-based learning is a powerful teaching method that: (1) motivates student; (2) prepares the students for college, careers, and citizenship; (3) helps students meet standards and do well on tests that ask them to demonstrate in-depth knowledge and thinking skills; and (4) allows teachers to teach in a more satisfying way (Larmer et al., 2015). Based on these definitions, project-based learning, at a glance, has similarities with the concept of problem-based learning. Both have a conceptual similarity in which learning is authentic and based on real problems. However, the difference between the two can be seen from the focus of learning. Project-based learning focuses

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29032

on learning in the final process in the form of a product (artifact), while the end result of problem-based learning does not always lead to the product. At the same time, the problem in project-based learning is an obstacle experienced by students during the process of project work so that students need to find solutions to problem-solving, while in problem-based learning depart from the problem as the foundation of the inquiry process in collecting knowledge.

Based on the phenomenon that occurs at PIKA VSS, the aim of this study is to describe how the process of project-based learning at PIKA Vocational Secondary School can form competent graduates and in accordance with the demands of the work field. The researchers also identified the advantages and disadvantages of project-based learning at PIKA VSS Semarang. It can be a reflection and solution for unemployment problems that occur in VSS graduates in Indonesia.

RESEARCH METHOD

The research was conducted at PIKA Vocational Secondary School (VSS) Semarang to describe project-based learning praxis at VHS PIKA Semarang. Based on the research problems that are holistic and departs from the specific cases that occur at PIKA VSS, the research method used is qualitative research, particularly Case Study. A case study is used when researchers want to understand a real-life phenomenon in depth (Yin, 2009). The data collection techniques were in-depth interviews, participant observation, and document analysis. The informants of this study were: principal, vice-principal, head of the workshop, teachers, employees, and students. The informants were selected using a purposive technique based on the following considerations: (1) people who know the learning process correctly; (2) people involved in the planning and implementing project learning; (3) people who have time to provide information. Observations were conducted in productive practice learning in grade X, XI, XII, and grade XIII internship activities in the production unit. The validity of the data was obtained using the triangulation technique (sources).

The data were analyzed using the interactive framework of qualitative data analysis, proposed by Miles and Hubberman (1994). There are four stages of data analysis. The first stage is to collect data from various data sources with different collection techniques. The second stage is to make data reduction by selecting and sorting data and categorizing it with a coding system. The data are reduced by grouping relevant data to answer research questions and getting rid of irrelevant data with research questions. The third stage is to present data into the data transcript table and matrix of data analysis to make the data more easily understood so that the meaning behind the empirical phenomenon can be captured clearly. The last stage is to draw conclusions from the data that has been processed and analyzed carefully to answer the problem's formulation.

RESULTS AND DISCUSSION

The Concept of Project-Based Learning at PIKA Vocational Secondary School

Project-based learning at PIKA VSS is a learning process that involves the students' project work. The project in question is the assignment of work assignments to students oriented to manufacture furniture products (product-oriented). “At PIKA VSS, since the beginning of the learning period, the students are given the assignment to make finished products for sale (W.LKS.SQ1)”, claimed a teacher. The application of the project-based learning model is based on the view that the learning model is suitable for teaching practice in VSS based teaching factory as it can present a real and contextual learning situation (not-simulation) in accordance with the characteristics of the work of manufacturing-based furniture industry. Head of The Workshop PIKA VSS said, “If the vocational school provides a simulation pattern of learning, competency cannot be achieved (W.A.SQ1).”

Conceptually, the project-based learning model is chosen as the embodiment of teaching factory teaching, in which there is a mix between the learning process and production process (Kuswantoro, 2014). The production process is used as a learning media to form students' work competence. In the learning process, students are given the task to realize the project manufacture of products through the manufacturing process both in the workshop and in the production unit.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29032

Project is designed by adjusting the substance of competence to be achieved. "Through the project learning model, students are expected to be able to achieve their competencies in accordance with industry expectations (W.MRS.SQ1)", claimed the principal.

Looking at the project-based learning praxis that is applied at PIKA VSS, the learning theory that can be used as the foundation is work-based learning and constructivist theory. This work-based learning theory emphasizes learning mastery in accordance with industry standards (Sudira, 2016). The foundation of constructivist learning theory can be understood from the roles of the students and teachers in the learning process. Students are required to be active and independent in building their knowledge through interaction with learning resources. The teacher acts as a facilitator and supervisor.

The praxis project-based learning at PIKA VSS has two different types of patterns. The first pattern is an internal apprenticeship program in a production unit intended for class XIII. The learning pattern is made by assigning project tasks to students to create furniture products, from designing creative product designs to keeping abreast of market developments. Next, creating a drawing of production work, compile a list of equipment and materials needs, designing a work plan. Then realize the product design in the process of production, reporting, and marketing of product results to customers in the showroom.

The second pattern is applied as a method of delivering productive practice materials in class X, XI, and also XII. Project tasks or work are designed by the teacher by adjusting the competence and quality dimensions of learning at each grade level. The competence substance to be achieved translates into a production work image that is used as a project task of the student in making the product.

The First Pattern as Entrepreneurship-Based Project Learning

The first pattern is called entrepreneurship-based project learning. The Vice Principal said, "Grade XIII is based on entrepreneurship, independent project, they design the product by themselves, sell to the market, like that it is a project-based concept (W.DW.SQ1)." Praxis Project-Based Learning as an internal internship program is organized with the aim to strengthen students' competencies which have been obtained in grade X, XI, and XII. Stabilization of work competence is done to prepare students in the program of external internship in the industry. It is done in the hope of minimizing the competency gap that has been gained with the demands of the industrial world.

Competencies already taught in grade X, XI and XII are strengthened by work-based learning experiences integrated with the manufacturing process. "Its importance, once again, is so that students have complete experience in a process from the beginning to the end for furniture manufacturing (W.LKS.SQ1)", claimed a teacher. Basically, the concept is in accordance with the principle of vocational learning in the theory of Prosser and Quigley. Vocational education will be effective and efficient when students are trained in an environment that resembles industry, and the training jobs are carried on in the same way, with the same operations, the same tools, and the same machines as in the occupation itself to develop habits of thinking and working required in the occupation itself (Prosser & Quigley, 1950).

Table 3. Planning Aspects

No.	Aspect	Description
1.	Purpose	Refers to the standard of competence
2.	Target	The specific size of the objectives achievement
3.	Material	Knowledge needed in practice
4.	Type of project	The type of product that will be done by students
5.	Scheduling	Work time target
6.	Division of groups	Division of groups based on student potential analysis
7.	Working procedures	The steps of work to be undertaken in learning
8.	Reporting results	Signs in writing the work report
9.	Product Marketing	The method used to market the products of students' work
10.	Assessment	The design of the types and criteria used for the assessment

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29032

The focus of learning on an internal internship program is to provide students with a series of production work tasks similar to those in the industry's manufacturing process. Learning requires good planning to achieve learning goals effectively and efficiently. Teachers are drafting such a way of learning that can be used as a guide project implementation. Guides are used to help students understand clearly the procedures and steps to be taken in the learning process. Aspects to be considered in the lesson planning are presented in Table 3. The stages of activities in the implementation of project-based learning include pre-production, production, and post-production activities, as shown in Figure 1.

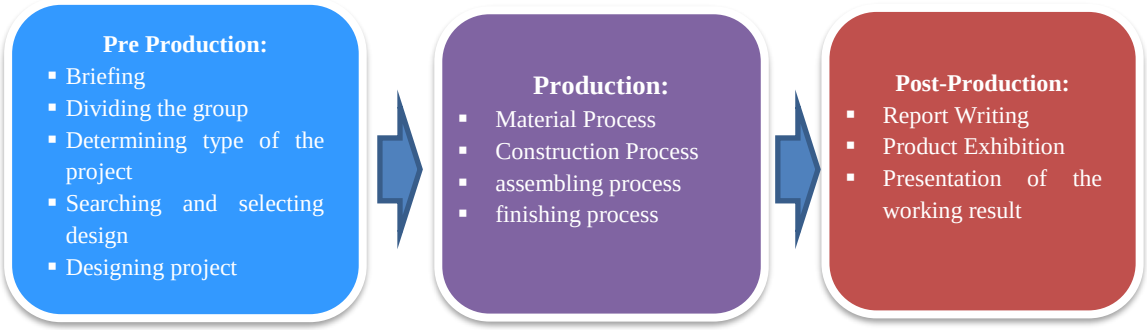


Figure 1. The Stages of Activities in the Implementation of Project-Based Learning

The pre-production stage is a learning activity conducted before realizing the project in the production process. Briefing activities are the first step in learning. At the briefing activity, the teacher explains the whole project tasks are done by the students. Teachers convey aspects of project work that have been prepared in the lesson planning. The teacher then divides the group. The student workgroup is determined by the teacher based on the characteristics and students' potential analysis. Students with a tendency in technical skills will collaborate with students who have a tendency in terms of drawing and design. “We have determined the groups based on competence. I consulted with the drawing teacher to determine the composition workgroup (W.A.SQ1)”, claimed the head of the workshop VSS PIKA.

Once students get the group and the type of project that will be created, students then look for and choose product design from various learning sources, such as the internet, magazines, or books. The group activity in project-based learning provides an opportunity for students to choose where, when, and how students work (Amaral et al., 2015). In pre-production activities, students are given wide and open opportunities to explore ideas from various learning sources, where and how they explore, select, and design product designs. Extensive opportunities for exploration allow for differences in ideas between individuals (students) in workgroups. The student said, “There is a lot of debate too, we already have (design), presented in class, this, this, this. There are opinions from friends all in; this is not right, it is right, it should be like this, from the teacher too, so there is an open mindset too, oh it turns out how to determine the right design like this (W.MG.SQ1).” Efforts to integrate the differences between individual ideas are made by solving problems by collecting ideas from group members. This technique is called brainstorming. Brainstorming technique is a process that students undertake to organize project tasks by collecting ideas as the solution to the problem (Bender, 2012).

After the selected design, students submit verification and consultation to the teacher to assess the feasibility of the design. Design feasibility is seen from two aspects, namely, (1) product selling value and (2) the possibility to be in production. For the product to be of sale value, the design needs to follow the growing trend in the furniture market but still pay attention to the possibility of the design being produced. If the design has been verified and approved by the teacher, then the students create a working drawing (production). Production work drawings must also pass through the business unit's quality control process in order to ensure the quality of the type and construction detail of the product. After that, the students then create a Material Requirement List

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29032

(MRL) and a work plan (time schedule). Product design, working drawings, basics of building construction, and work plan are made into a useful project planning document to guide the production process. Prior to the production process, the project design document was reexamined by the production workshop instructor to ensure completeness.

The next stage is the production activities. Students perform production processes based on the project planning documents. The production process includes four stages, namely, the material, construction, assembly, and then finishing. At each stage of production, students collaboratively carry out parts of the work that have been organized by the group leader. One of the leaders' group explained, "After the design is finished, then we begin the selection and sorting of the materials, we have divided. Then we begin the process of dimensioning, construction, to the assembly stage (W.R.SQ2)." The leader of the group as leader has the duty to control its members' work to complete the project in accordance with the time targets and work plans listed in the project plan document. The field instructor conducts overall monitoring and guidance in the production process. "The Instructor carries out a monitoring and mentoring process when there are students who experience technical difficulties (W.LKS. SQ2)", claimed a teacher. The instructor ensures that the student performs the work in the right way and procedure, ensures the quality standards of work at each stage of production, and provides solutions when students experience problems or technical constraints in the field.

After the production process is complete, then the next stage is post-production. Post-production activities in project-based learning include report writing, product exhibitions, and results presentation. Report writing aims to train students' communication skills in conveying process and job results in writing, while the presentation of the work is intended to train students' verbal communication skills. Meanwhile, product exhibition activities from project-based learning aim to form the character of entrepreneurship (entrepreneurship) into the students themselves. The involvement of students in product exhibition activities is as marketing in charge of offering and explaining products to customers. This is done with the aim to train students' ability to build relationships with customers (customer) and understand the wishes and expectations of customers of the product.

After the learning is completed, then the teacher evaluates the lesson. Evaluation is done by looking at the overall assessment results, both process and output (output) of learning. The type of assessment undertaken is an authentic assessment consisting of project appraisal, product assessment, and student performance appraisal.

The Second Pattern as Guided Project Learning

Project-based learning on productive practice programs is different from apprenticeship programs. In learning productive practice, teachers make design and project design as a task that must be done and realized by students. The second pattern of Project-Based Learning is guided project learning. The project is designed as a training medium to develop productive competencies, so that project design adjusts competence demands and learning quality dimensions at each grade level. The head of the workshop said, "The training planned by the teacher refers to the competency units to be taught. One job represents one unit of competence (W.A.SQ2)." Differences in competence demands and the quality dimensions of learning in each grade make the learning-based have different characteristics (see Table 4).

Table 4. Characteristics Differences of Project Based Learning at PIKA VSS Semarang

Aspect	Grade X	Grade XI	Grade XII
Project Type	Fragment Shape	Simple Furniture	Furniture Set
Quality dimension	Sense of Quality	Sense of Efficiency	Sense of Teamwork
Work System	Individual	Individual	Collaborative
Tools	Manual	Basic Machine	Industrial Machine

Project-based learning in grade X focuses on developing basic individual competencies, such as the making of workpiece dimensions, various construction of wooden connections to small size furniture products so that the resulting product is still in the form of fragments. The units of competence to be achieved are translated into working drawings and used as students' project assign-

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29032

ments. Making the product is done individually using manual equipment. Learning emphasizes the dimension of the *sense of quality* so that students understand the quality of work, the results of work, and also the attitudes appropriate to industry standards. "Students complete each training if their work has met specified quality standards (W.LKS.SQ2)", said a teacher. The cultivation of a sense of quality is done by minimizing tolerance to error, either from the working process or from the product produced. The teachers plan any training during one year of learning starting from the basic to the complex level, from how to use manual tools, training basic woodwork skills to make workpieces that are still in the form of fragments of wooden joints (W.DW.SQ4; WASQ4.13)

Project-based learning in productive practice in grade XI is the development of learning in grade X. Grade XI project learning becomes a vehicle for applying the competencies taught in grade X. Basic skills taught and accumulated learning experiences in creating fragmented products are used as stock to do more complex project work. The project is already made in the form of simple furniture products. Dimensions of the quality of learning to be achieved more emphasis on the *sense of efficiency*. The teacher said, "Learning in class XI emphasizes aspects of efficiency, efficiency in terms of work time, and material usage (W.IND.SQ4)." Therefore, in the learning in grade XI, students are required to be able to do the work using basic machines and a work plan flowchart while maintaining a sense of quality that has been learned in class X (W.DW.SQ4.33, W.MG.SQ4.36 & 46).

Project-based learning in grade XII is a learning development applied in grade XI. Project design is more complex both from specification and detail of construction. The process is already using industrial machines. The focus of competency development is on the ability to manage projects collaboratively. It is based on the dimensions of the quality of learning in grade XII that emphasizes the *sense of teamwork*. Thus, learning is done to apply the skills that have been obtained in grade XI and, at the same time, train students' leadership skills to manage and complete the project collaboratively.

The Advantages of Project-Based Learning

The first, project-based learning will train students' independence in their work. The teacher said, "The students will learn independently because they have ideas, hopes from students, passion from students so that they can be independent, they will work on their own looking for what is good, then self-designed, then work on their own (W.LKS.SQ4)." Students are required to be active in building the knowledge of the project completion process, and the teacher acts as a facilitator. Thus, the knowledge gained is more meaningful.

The second, project-based learning will improve students' learning motivation (Trianto, 2014). "The students are motivated in learning and working earnestly, because projects designed are based on ideas from students so that the desire about the product model made comes from students (W.DW.SQ6)," said the Vice Principal. Learning motivation arises from the challenges and demands to complete the project. Challenges and demands will stimulate the diligence and hard work of the students in completing projects. Diligence and hard work will also arise when the idea of the project comes from the students. Such project-based learning is applied to grade XIII.

The third, project-based learning can bring real and contextual learning nuances. Learning is real and contextual because the learning process is integrated with the production process, and learning materials are directly related to the work in the industry. The teacher said, "The students learn mindfully about the production process. This process starts from designing, the process of materials, the process of construction, the process of assembling, the process of finishing product (W.LKS.SQ6)." The learning experience gained will be memorable and kept in mind by the students. An industry-like learning climate will enable increased understanding, reminders, and re-implementation at work (Silberman, 2014).

The fourth, project-based learning can develop both soft and hard skills. The skills of the trained soft skills include creative thinking ability, oral and written communication skills, collaborative skills and teamwork, problem-solving skills, and leadership skills in managing projects. In addition, project-based learning can also develop hard skills, including the ability to use machinery, identify materials, use the software, and others.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29032

The Disadvantages of Project-Based Learning

In addition to having advantages, project-based learning also has a lack of aspects that can be used as a consideration for schools to apply project-based learning. The first shortcoming, project-based learning will be effective when students have mastery of the concept of knowledge that is needed to perform the job task (project). The vice-principal further explained, "One of the skills needed in project work is the ability to understand the product's work image. If the ability to understand the working drawings has not been fully mastered, then in the production process, often mistakes occur (W.DW.SQ7)." "If there are many mistakes in the field and the cost is too high because many materials reject, the material must be replaced (W.A.SQ7)", claimed the head of the workshop. Before using the project strategy in the learning activities, the students already have some knowledge and skills related to project tasks, so that students can apply the knowledge and skills to complete the project (Kosasih, 2014; Wena, 2014). Therefore, teachers should carefully consider whether students already have the necessary skills to perform the job tasks.

Second, project-based learning requires a considerable length of time in a single project. Project-based learning requires a broad time duration due to complex process activities (Kosasih, 2014; Sumarni, 2015). Each stage of work takes a long time to complete the work. Teachers are required to be able to estimate the time of project construction so as not to neglect other learning activities. "If they cannot manage their time, then the product is not finished (W.A.SQ7)", claimed the head of workshop.

Third, project-based learning requires substantial operational costs. The head of the workshop stated, "Project-based learning requires a large amount of money, especially to provide practice material (W.A.SQ8.13)." High operational costs are identified from the type of projects that are made by students in the form of furniture products in terms of material needs costly. It starts from the direct costs for the main materials such as wood, glue, finishing layer, and also the indirect cost in the form of electricity usage, material delivery, and others. Fourth, project-based learning requires the availability and preparation of adequate facilities as well as infrastructure. Without the availability of adequate facilities and infrastructure, the learning process will not run effectively and efficiently.

CONCLUSION

The praxis of project-based learning at PIKA VSS Semarang has two different types of patterns. The first pattern is entrepreneurship-based project learning. The learning process in a production unit is performed within the context of an internal internship by assigning tasks to students for autonomous product manufacturing projects, from designing products to production processes to reporting results and selling/marketing. The second pattern is a guided project learning. Project-based learning is a method of delivering learning materials in the form of productive practice through project tasks provided by the teacher by adjusting the substance of competence in each grade level.

The advantages of project-based learning, among others, are (1) training students' sensitivity towards independence (sense of entrepreneurship); (2) improving learning motivation; (3) providing a real and contextual learning experience of the furniture manufacturing process; and (4) developing student employability skill. Meanwhile, the disadvantages of project-based learning, among others, are that project-based learning: (1) cannot be effective when students have not mastered the competencies required to carry out project tasks; (2) requires a long duration of time; (3) requires high operational costs for material procurement and equipment operationalization; and (4) requires adequate facilities with industry standards.

ACKNOWLEDGMENT

The authors acknowledge the assistance and encouragement from the Postgraduate Program of Universitas Negeri Yogyakarta and PIKA Vocational Secondary School Semarang so that this research can be conducted.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29032

REFERENCES

Adriyanto, A. (2012). *SMK PIKA Semarang, sekolah atau pabrik?* Vocational Education. https://1ptk.blogspot.com/2012/09/smk-pika-semarang-sekolah-atau-pabrik.html

Amaral, J. A. A. do, Gonçalves, P., & Hess, A. (2015). Creating a project-based learning environment to improve project management skills of graduate students. *Journal of Problem Based Learning in Higher Education*, *3*(2), 120–130. https://doi.org/10.5278/ojs.jpblhe.v0i0.1178

Bender, W. N. (2012). *Project-based learning: Differentiating instruction for the 21st century*. Corwin.

Berita Jateng. (2015). *Siswa SMK PIKA ikuti World Skill Competition di Brasil*. BeritaJateng.Net. http://beritajateng.net/siswa-smk-pika-ikuti-world-skill-competition-di-brasil/

Boutin, F., Chinien, C., Moratis, L., & van Baalen, P. (2009). Overview: Changing economic environment and workplace requirements: Implications for re-engineering TVET for prosperity. In R. Maclean & D. Wilson (Eds.), *International handbook of education for the changing world of work*. Springer.

Kosasih, E. (2014). *Strategi belajar dan pembelajaran: Implementasi Kurikulum 2013*. Yrama Widya.

Kuswantoro, A. (2014). *Teaching factory: Rencana dan nilai enterpreneurship*. Graha Ilmu.

Larmer, J., Mergendoller, J., & Boss, S. (2015). *Setting the standard for project based learning: A proven approach to rigorous classroom instruction*. ASCD.

Miles, M. B., & Hubberman, A. M. (1994). *Qualitative data anaysis*. SAGE Publications.

Mulyadi, E. (2016). Penerapan model project based learning untuk meningkatan kinerja dan prestasi belajar Fisika siswa SMK. *Jurnal Pendidikan Teknologi Dan Kejuruan*, *22*(4), 385–395. https://doi.org/10.21831/jptk.v22i4.7836

Pancawati, R., & Sukardi, T. (2017). Profil pembelajaran kewirausahaan pada business center SMK Bisnis dan Manajemen di Kota Yogyakarta. *Journal of Vocational and Work Education*, *1*(1), 119–132. http://journal.student.uny.ac.id/ojs/index.php/JoVWE/article/view/6097

Prosser, C. A., & Quigley, T. H. (1950). *Vocational education in a democracy*. American Technical Society.

Setiawaty, T. (2013). Penerapan best practice pada manajemen pembelajaran praktek SMK PIKA Semarang dalam mempersiapkan lulusan siap kerja dan berdaya saing global. *Innovation of Vocational Technology Education*, *9*(2), 179–200. https://doi.org/10.17509/invotec.v9i2.4879

Silberman, M. (2014). *Handbook experiential learning: Strategi pembelajaran dari dunia nyata* (M. Khozim (trans.)). Nusa Media.

Sudira, P. (2016). *TVET abad XXI: Filosofi, teori, konsep, dan strategi pembelajaran vokasional*. UNY Press.

Sugestiyadi, B. (2012). *Model magang siswa Sekolah Menengah Kejuruan (SMK) bidang studi Teknik Furniture di Jawa Tengah* [Doctoral thesis. Universitas Negeri Yogyakarta, Yogyakarta]. https://eprints.uny.ac.id/31753/

Sumarni, W. (2015). The strengths and weaknesses of the implementation of project based learning: A review. *International Journal of Science and Research (IJSR)*, *4*(3), 478–484. https://www.ijsr.net/get_abstract.php?paper_id=SUB152023

Trianto, T. (2014). *Mendesain model pembelajaran inovatif, progresif, dan kontekstual*. Prenada Media.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401

https://doi.org/10.21831/jpv.v10i1.29032

Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. Jossey-Bass.

Ulya, F. N. (2019). *BPS: Pengangguran meningkat, lulusan SMK mendominasi* (Y. Sukmana (ed.)). Kompas.Com. https://money.kompas.com/read/2019/11/05/155358926/bps-pengangguran-meningkat-lulusan-smk-mendominasi

Wena, M. (2014). *Strategi pembelajaran inovatif kontemporer: Suatu tinjauan konseptual operasional*. Bumi Aksara.

Yin, R. K. (2009). *Case study research: Design and methods*. SAGE Publications.

ISSN (print) 2088-2866 | ISSN (online) 2476-9401