Journal of Harbin Engineering University
ISSN: 1006-7043
Vol 44 No. 7
July 2023

Development of Practice Field Models Based on Learning Curriculum to Improve Technical and Business Competence

Brenden Fredrik Immanuel, C. Rudy Prihantoro, Priyono
Department of Engineering, Universitas Negeri Jakarta, Indonesia
Correspondence E-mail: brendenimmanuel13@gmail.com

Abstract
This research has the aim of developing a Field Work Practice model based on the Open to Learn Curriculum in increasing the expertise of Automotive Engineering and Motorcycle Business. This research was conducted with a total sample of 30 people who were students with expertise competence Motorcycle Engineering and Business. The research used is the Borg & Gall model developer and design experiment pre-test and post-test research by comparing the conditions before and after using the Work Practice model Developed field. Then use the same class to give two results namely, before (as form of the control data group) and after being given treatment (as the form of the experimental data group). The data analysis technique used is the t test. The results showed that learning using the Field Work Practice Model increased the competence of students and had a positive effect on technical competence, work culture and management of motorcycle repair shops. Students are ready to carry out Field Work Practices implementing the Open Learning Curriculum.

Keywords: Field Work Practice, Model development, Engineering and Motorcycle Business, Soft Skill.

INTRODUCTION

Education is a conscious and planned effort to create a learning atmosphere and learning process so that participants students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, noble character, and the necessary skills himself, society, nation and state(UU, 2003a). Vocational High School (SMK) is a vocational school that prioritizes the development of students' abilities to be able to work in certain fields, the ability to adapt to the work environment, see job opportunities and be able to develop themselves in the Globalization Era.

Vocational education in elucidation 15 of the SISDIKNAS Law(UU, 2003b) is secondary education which aims to:1). Preparing students to become productive human beings able to work independently, fill job vacancies in the business world and the industrial world as a level workforce medium according to competence in the expertise program chosen, 2). Prepare students to be able to choose career, tenacious and persistent in competing, adapting in the environment work, and develop a professional attitude in the field of expertise of interest, 3). Equip students with knowledge, technology, and art, to be able to develop themselves in the future both independently and through the levels higher education, 4). Equip students with competencies in accordance with the program of expertise chosen.

The Vocational High School (SMK)was established to anticipate the need for a qualified and ready-to-use secondary workforce in the world of business and industry. The main goal is to prepare participants enter the workforce and develop attitudes professionalism. The resulting SMK graduates must have vocational expertise competence in accordance with the expertise program, high work culture, and communication skills(Star et al., 2013). These skills are in accordance with the demands of the job to work effectively and efficiently. In developing their expertise and skills and ready to compete in the world of work. In the era of globalization which is supported by technological advances information, knowledge, innovation, and problem networks happened in high school(Elliott & Williams, 2004; Lee, 2020; Lim et al., 2010; Mitton-kükner & Murray-orr, 2018). The Ministry of Education and Culture designed the latest curriculum, namely the Freedom to Learn Curriculum to become a revolution in Indonesian education that is increasingly quality in learning and preparation for industrial and world of work needs (IDUKA).

Freedom to Learn is program which is the beginning of the idea for improve the national education system(Hendri, 2020). The goal is to create independence and freedom in activities, learning to produce the desired Human Resources. This is to support the learning process which can produce

graduates who are competent and have character in accordance with the demands of industry and the world of work(Çoklar & Yurdakul, 2017; Gazi et al., 2022; Ismail et al., 2017; Rosdianto et al., 2019). To prepare human resources with competence and character in accordance with the demands of industry and the world of work (IDUKA) there needs to be harmony between the world of work and SMK, which is not only illustrated through a cooperation agreement between the two parties which is called link and match.

Ministry of Education, Culture, Research and Technology (2021) On the Ministry of Link and Match Program all of which relate to the importance of world engagement the work of implementing link and match partnerships(Wibisono et al., 2020). Overall, in accordance with the agreement with the world of work, at least includes: 1) Compilation and alignment of industry-based and world-based curricula Work; 2) Real project-based learning (products/services) from the world of work; 3). Involvement of guest teachers/teachers from industry and working world; 4) Implementation of street vendors program; 5) Administration competency certification recognized by industry and the world of work for graduate of; 6) Teacher training in SMK by industry; 7) Applied research that originates from real cases or needs of the community; 8) Manufacturing commitment to the world of work for the absorption of SMK graduates; And 9) Providing scholarships or official ties by the world of work for participants

Vocational High School Ministry of Education and Culture Research Technology (2022) PKL Subject is learning in world of work to provide opportunities for students improve the mastery of technical competence (technical skills) accordingly by concentrating on his skills and internalizing his character and work culture (soft skills)(Brusesels, 2018; Mihaela, 2015; Rachmawati & Suyatno, 2021; Sobinova et al., 2015). However, there are still many deficiencies the preparation of the PKL SMK program that is not going well, evidenced by the discovery of street vendors program that is not appropriate with the implementation of the knowledge gained while in SMK, and many activities deviate quite far, as well as the role of the school who have not cooperated well with the industry.

RESEARCH METHODS

This study aims to produce a Field Work Practice model based on the Free Learning Curriculum for Junior High School. Motorcycle Engineering and Business Skills improve and prepare students in mastering technical competencies (technical skills), internalizing character and work culture (soft skills), the process of managing and developing motorcycle repair shops. Research on this model of street vendors is a type of research and development. Research on the street vendor model Based on the Independent Learning Curriculum at the Motorcycle Engineering and Business Vocational School, this is a type of research and development. The development of this research went through several stages, consisting of five stages, namely research and data collection (research and information collecting), planning stage (planning), product draft development stage (develop form of product), validation test stage, validation revision stage (main product revision), Main Field Test.

The treatment in this study was once. Before given treatment, students are first given a pre-test. After being given treatment, students were given a post-test. So, on three times. In this study there are two variables, namely the independent variable and the dependent variable. According to (Suharsimi, 2016) the sample is part or representative of the population will be researched. The sample in this study were students with class XI Motorcycle Engineering and Business skills competencies in Saint Joseph's Vocational High School.

Data collection techniques using observation, documentation, and assignments. The analysis steps are carried out are as follows: (1) Determine the average score pre-test and post-test; (2) Normality test using Kolmogorov Smirnov; (3) After carrying out the normality test, next homogeneity test is carried out; (4) After obtaining the prerequisite data to be normally distributed and homogeneous, then tested hypothesis by using the t-test by usings PSS software. ver. 26.0; and (5) Test Criteria.

The analysis of this study uses a research design experiment one group pre-test and post-test by comparing the conditions before and after using the Field Work Practice model developed. Then use the same class by giving two results i.e., before (as of the form control data group) and after being given treatment (e.g., the form of the experimental

data group) based on the experimental model which can be seen in Figure 1.

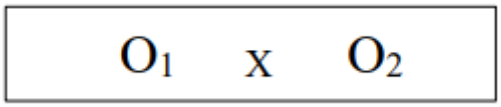

Figure 1. One group pre-test and post-test

Description: O_1 value before treatment, O_2 value after treatment, and X treatment.
H_0 = Average pre-test before taking treatment = Average post-test after taking treatment,
H_1 = Average pre-test before taking treatment ≠ Average post-test after taking treatment.

RESULTS AND DISCUSSION

Description of the results of this study is research data obtained from the pre-test and post-test activities carried out by the researcher giving a pre-test with the intention of knowing the stability and the clarity of the condition of the group before it was formed, the researcher too give a post-test to find out the success of the treatment given. The following shows the pre-test and post-test results in table 1.

Table 1. Results of Pre-test and Post-test

	Results of Pre-test	Results of Post-test
n (total sample)	30	30
Max score	96	97
Min score	52	74
Means score	74	87
Sdt. deviation	9.288	8.166
Variance	86.271	66.689

Based on the test results presented in table 1, the first pre-test score is a minimum score of 52 and a maximum score of 96. The average value is 74, the standard deviation is 9.28823, and the variance is 86.271. Furthermore, in post-test activities obtained a minimum score of 74, the maximum value 97, the mean value is 87, the standard deviation is 8.16673, and the variance value 66,689. Then a normality test was carried out to find out whether the pre-test and post-test scores obtained came from normally distributed data or not. The basis for decision making is if the value L-statistic> L-table, then H_0 is accepted, meaning the data is normally distributed, and if the value of L-statistic < L-table, then H_0 is rejected, it means that the data is not normally distributed. Based on the results of the normality test that the Asymp value is obtained. Sig (2-tailed) pre-test and post-test of 0.200 using the test Kolmogorov Smirnov. Because Sig (2-tailed) pre-test and post-test > 0.05, then H_0 is accepted. It shows that the pre-test and post-test values come from the data normally distributed. After carrying out the normality test using SPSS software, then the researcher conducted a test homogeneity which aims to determine whether the variation on some data comes from data that has equal variances or not. Based on the results of the homogeneity test using the Levene test where the results show Sig. 0.917. From the homogeneity test results shows a p-value > 0.05 which is based on value statistics This shows that the data comes from homogeneous data.

Next, a hypothesis test was carried out. Test the research hypothesis done using the t-test formula. The Field Work Practice Model influences technical competence, work culture and motorcycle repair shop management if the table is at a significant level <0.05, otherwise if the significant level is > 0.05 then the Practice Model field work has no effect on technical competence, work culture and management of motorcycle repair shops. The results of hypothesis testing can be seen in table 2.

Table 2. Results of hypothesis testing

	Mean	Std. deviation	t statistic	Sig. (2-tailed)
Pre-test and Post-test	-14.067	9.285	-8.298	0.000

Based on the data above, the value of Sig. (2-tailed) .000 < 0.05. This means that there is a significant difference in development of the Field Work Practice Model of technical competence, work

culture and workshop management motorbikes for students of SMK Sint Joseph Competency Motorcycle Engineering and Business Expertise. It can be concluded that the field work practice model can improve motorcycle technical and business competence.

This finding is in line with the results of research by (Hamalik, 2017)which states that field work practices have benefits as an integral part of training programs, industrial practices need to be carried out because they contain certain benefits. The benefits of field work practice include the following: (1) Provide opportunities for students to practice management skills in actual field situations. This is important to learn to apply theory, concept or previously learned principles. (2) Deliver practical experiences for students so that research results expanded. (3) Students have the opportunity solve various management problems in the environment the field using their abilities. (4) Approaching and bridging the preparation of Learners for plunged into his field of work after taking part in a training program street vendor.

CONCLUSION

The research results show that learning by using the Participant's Field Work Practice Model students at Sint Joseph Vocational School make a positive influence on technical competence, work culture and workshop management motorbikes of Sint Joseph Vocational High School students. This is evidenced by the results described in graph where the value shows the difference significant difference between the results of the pre-test and post-test. This can interpret Field Work Practice Model developed provide an increase in technical competence, work culture and motorcycle repair shop management.

REFERENCES

[1] Brusesels. (2018). Competences for Lifelong Learning. *European Commission, Education and Training*, *17*(1), 1–103. http://www.theeuropeanlibrary.org/tel4/record/2000004678898

[2] Çoklar, A. N., & Yurdakul, I. K. (2017). Technology Integration Experiences of Teachers. *Discourse and Communication for Sustainable Education*, *8*(1), 19–31. https://doi.org/10.1515/dcse-2017-0002

[3] Elliott, E., & Williams, G. (2004). Developing a civic intelligence : local involvement in HIA. *Environmental Impact Assessment Review*, *24*, 231–243. https://doi.org/10.1016/j.eiar.2003.10.013

[4] Gazi, M. A. I., Islam, M. A., Sobhani, F. A., & Dhar, B. K. (2022). Does Job Satisfaction Differ at Different Levels of Employees? Measurement of Job Satisfaction among the Levels of Sugar Industrial Employees. *Sustainability (Switzerland)*, *14*(6). https://doi.org/10.3390/su14063564

[5] Hamalik, O. (2017). *Dasar-dasar Perkembangan Kurikulum*. PT. Remaja Kosdakarya.

[6] Hendri, N. (2020). Merdeka Belajar; antara retorika dan Aplikasi. *Jurnal Ilmiah Teknologi Pendidikan*, *8*(1), 1–8. https://doi.org/10.1007/XXXXXX-XX-0000-00

[7] Ismail, H., Syahruzah, J. K., & Basuki, B. (2017). Improving the Students' Reading Skill Through Translation Method. *Journal of English Education*, *2*(2), 124–131. https://doi.org/10.31327/jee.v2i2.405

[8] Lee, J. S. (2020). The role of informal digital learning of english and a high-stakes english test on perceptions of english as an international language. In *Australasian Journal of Educational Technology* (Vol. 36, Issue 2, pp. 155–168). https://doi.org/10.14742/AJET.5319

[9] Lim, C., Lee, T., & Guan, C. (2010). Effectiveness of a brain-computer interface based programme for the treatment of ADHD: a pilot study. *Psychopharmacol Bull*, *43*(1), 73–82. https://doi.org/10.4324/9781315853178

[10] Mihaela, P. L. (2015). Dimensions of Teaching Staff Professional Competences. *Procedia - Social and Behavioral Sciences*, *180*(November 2014), 924–929. https://doi.org/10.1016/j.sbspro.2015.02.245

[11] Mitton-kükner, J., & Murray-orr, A. (2018). Pedagogies of pace : Temporal insights into Canadian pre-service teachers ' pedagogical decision-making. *International Journal of Educational Research*, *90*(February), 32–42. https://doi.org/10.1016/j.ijer.2018.05.005

[12] Rachmawati, Y., & Suyatno, S. (2021). The effect of principals' competencies on teachers' job satisfaction and work commitment. *Participatory Educational Research*, *8*(1), 362–378. https://doi.org/10.17275/per.21.21.8.1

[13] Rosdianto, H., Sulistri, E., & Munandar, N. (2019). Penerapan Model Pembelajaran ADDIE Untuk Meningkatkan Keterampilan Proses Sains Siswa Pada Materi Kinematika Gerak Lurus. *Jurnal Pendidikan Fisika Dan Keilmuan (JPFK)*, *5*(1), 53. https://doi.org/10.25273/jpfk.v5i1.2947

[14] Sobinova, L., Shvetsov, D., Glushenko, D., & Maltseva, A. (2015). Pedagogical Conditions for Developing the Professionally Oriented Communicative Competence in a Technical University. *Procedia - Social and Behavioral Sciences*, *206*(November), 219–224. https://doi.org/10.1016/j.sbspro.2015.10.011

[15] Star, J. R., Foegen, A., Larson, M. R., McCallum, W. G., Porath, J., Zbiek, R. M., Caronongan, P., Furgeson, J., Keating, B., Lyskawa, J., Taber, M. R., Obeng-denteh, W., Wenglinsky, H., American Chemical Society, Limjap, A., Journal, I., Learning, E., Vol, D. U. K., Centre, E., … Windsor, W. (2013). Motivational Strategies in the Teaching of Primary School. *Anales de Psicologia*, *2*(2), 369–376. http://docs.google.com/Doc?docid=0Abxax2m5vHmkZGN3ejZ3ZG5fNDI1YzNmaDhwY2I&hl=fr%5Cnfile:///C:/Users/Nikki Mark - Worrell/Downloads/1885-5666-1-PB (1).pdf%5Cnhttps://is.muni.cz/th/86952/ff_m_b1/MgrDiplomkaBoumova.pdf%5Cnhttps://www.acs.org/content/dam/acsor

[16] Suharsimi, A. (2016). *Prosedur Penelitian : Suatu Pendekatan Praktik*. Rineka Cipta.

[17] UU. (2003a). *Sistem Pendidikan Nasional* (Issue 1, p. 26). Undang-Undang Republik Indonesi No. 20.

[18] UU. (2003b). *Undang-Undang.pdf*.

[19] Wibisono, G., Wijanarka, B. S., & Theophile, H. (2020). The Link and Match between the Competency of Vocational High Schools Graduates and the Industry on CAD/ CAM and CNC. Jurnal Pendidikan Teknologi Dan Kejuruan, 26(1), 26–34. https://doi.org/10.21831/jptk.v26i1.27932

[20] Balakrishnan S., R. Saranya, M. Suryakumar, Ankush Sharma, Karthika M., & R. Gopinathan. (2022). A STUDY ON EMPLOYER BRANDING FOR HOSPITALS WITH REFERENCE TO COIMBATORE. Journal of Pharmaceutical Negative Results, 1401–1408. https://doi.org/10.47750/pnr.2022.13.S06.185

[21] Ramu V., S. Balakrishnan, B. Vidya, N. Dharmarasu. (2022). A Study Of Passenger Satisfaction Of Irctc's Rail Neer Service. Journal of Positive School Psychology, 4330-4335.