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IMPORTANT ROLE VOCATIONAL SCHOOL TO OPTIMALLY IMPLEMENT TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING (TVET)

Peran Penting SMK untuk Optimalisasi Implementasi Pendidikan dan Pelatihan Teknis dan Kejuruan

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Abstract: Technical and vocational education and training (TVET) have an important role in supporting the success of vocational education. The need for assistance in the implementation of TVET in vocational schools aims to ensure that implementation TVET is not misdirected and is not the wrong destination. This research survey was conducted on vocational school students in Bekasi district by taking random samples. Verification analysis is performed to hypothesis testing on the influence between variables using structural equation modeling. This study empirically examines the important role of TVET based on preparation, implementation and competency so that it can have an impact on the relevance of knowledge and skills produced. Results of this study stated that preparation, implementation and competency had a significant influence on TVET impact which was applied to vocational students. Vocational students can feel TVET impacts include relevant to current work, use of skills, utilization of knowledge, results of training, adequate living needs, results of assessments. This research is expected to be used as a suggestion for the development of quality for vocational schools at the secondary education level can be aligned with objectives of TVET.

Keywords: TVET, vocational education, Indonesia

Abstrak: Pendidikan dan pelatihan teknis dan kejuruan (PPTK) memiliki peran penting dalam mendukung keberhasilan pendidikan vokasi. Perlunya pendampingan dalam pelaksanaan PPTK pada SMK agar pelaksanaan PPTK tidak salah arah dan tidak salah tujuan. Survei penelitian ini dilakukan pada siswa SMK di kabupaten Bekasi dengan pengambilan sampel secara acak. Analisis verifikatif dilakukan untuk menguji hipotesis pengaruh antar variabel dengan menggunakan pemodelan persamaan struktural. Mempelajari peran penting PPTK yang didasarkan pada persiapan, implementasi dan kompetensi yang sesuai dengan relevansi pengetahuan dan keterampilan yang dihasilkan. Hasil penelitian menyatakan bahwa persiapan, implementasi dan kompetensi memiliki pengaruh signifikan terhadap dampak PPTK yang diterapkan pada siswa SMK. Dampak PPTK yang dapat dirasakan oleh siswa SMK dapat relevan dengan pekerjaan saat ini, pemanfaatan keterampilan, pemanfaatan pengetahuan, hasil pelatihan, kebutuhan hidup yang memadai, hasil penilaian. Penelitian ini diharapkan dapat digunakan sebagai saran untuk pengembangan kualitas SMK sebagai sekolah kejuruan pada tingkat pendidikan menengah bisa selaras dengan tujuan PPTK.

Kata Kunci: Pendidikan dan pelatihan teknis dan kejuruan pendidikan kejuruan, smk, indonesia

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INTRODUCTION

Vocational education is undergoing rapid technological development transformation. To answer the challenges of educational transformation in the era of industrial revolution 4.0 on vocational education, it is necessary to think about steps that must be taken by involving all stakeholders to answer this challenge. ASEAN member countries are struggling with shortcomings skilled labor that can slow economic growth and jeopardize further economic and social development (Grosch, 2017). Education is one of the efforts to educate the life of the nation, so that the nation becomes more advanced and respected by other countries at the international level (Yunanto, 2016). Indonesia uses kejuruan education nomenclature at the secondary level and vocational education at the higher education level, where kejuruan education and vocational education focus on preparing students to work, while TVET in the nomenclature of vocational education becomes comprehensive in education and training process for the world of work with activities carried out at school and work (Verawardina & Jama, 2018). Indonesia faced with the challenges of changing the work environment and increasingly disruptive work methods in the industrial revolution era 4.0 that require new skills so that preparation of human resources as graduates of vocational schools must have appropriate competencies and even have multi competencies with technological development is a necessity (Sudira, 2018).

Education aims to prepare Indonesian people to have the ability to live as individuals and citizens who are faithful, productive, creative, innovative, and able to contribute to the life of the world, nation, state, and world civilization (Muslim, Kusumawati, Ismayati, & Rahmadyanti, 2019). The curriculum should be designed in synergy between the government, industry and education that the curriculum development has a link and match between educational institutions and industry, curriculum material that is always updated according to industry needs and contains the competencies needed to enter the world of work, business, and industry (Verawadina, Jalinus, & Asnur, 2019).

TVET is seen by many to be a combination of formal, informal and non-formal learning that provides young graduates with the required knowledge and skills for employment (Rajadurai et al., 2018). TVET is as comprising of education and training and skills development relating to a wide range of occupational fields, production, services and livelihood, and as part of lifelong learning can take place at secondary, post-secondary, tertiary and includes work based learning and continuing training and professional development that may lead to a qualification, includes wide range of skill development at national and local context, and needs to consider literacy, numeracy skill, transversal skills and citizen skills (UNESCO, 2019). TVET is considered a fundamental element in the development of knowledge, skill and ability (Geressu, 2017).

SMK is the highest contributor to unemployment in Indonesia, this shows the problem of inequality and the relevance of vocational education competencies with the world of work (Verawadina et al., 2019). Graduates of vocational higher education are graduates who are ready to work (Suciati, 2018). Objectives of vocational education are preparing students to enter employment and develop professional, increasing the ability of students to be able to develop themselves along with the development of science, improve the ability of students as members of the community who are able to establish reciprocal relations with the surrounding social and natural environment (Muslim et al., 2019). As an educational institution that educates prospective workers, the advantages developed by vocational high schools are prioritized on the excellence of Human Resources (Yunanto, 2016).

Competencies have become primary source of institutions in terms of evaluating the employee's skills and abilities (Hamisu, Salleh, Sern, Adamu, & Gambo, 2017). The vocational curriculum needs to apply blended learning which integrates face-to-face and online learning to more effectively build graduates' abilities and skills, and needs to contain mastery of 4.0 competencies such as data literacy, technology literacy and human literacy so that vocational education curricula have a broad impact on governments, educational institutions and industries to work together to

revitalize the approach and content of the vocational education curriculum (Verawadina et al., 2019). The curriculum of TVET is based on a career title which plays a significant role in producing skilled and semi-skilled human resources in the world of work (Hanimastura, Hairulliza, Tengku, & Tengku, 2016). TVET is considered a value-added component to a general education that incorporates technologies, sciences, practical skills, attitudes, understanding and knowledge relating to occupations in various sectors of economic and social life (Rajadurai et al., 2018).

Therefore to measure the impact of TVET implemented in developing vocational high schools need to be elaborated more in the hope of producing an education and training system whose purpose is to prepare the workforce according to needs through various steps that are passed including preparation, implementation and competence. Along with the development of science and technology and in harmony with the industrial revolution 4.0 that utilizes modern technology so that vocational graduates are expected to have insights, ideas and new jobs generated through TVET program planning and implementation in accordance with competencies.

METHOD

The verification approach is applied in this study to test the hypothesis of the influence between variables. Verification test of influence between variables uses structural equation modeling (SEM) with research variables used including TVET preparation, TVET implementation, TVET competency and TVET impact. The analysis unit is a vocational high school (SMK) located in Bekasi District, while the observation unit is vocational teachers in both public and private schools. This research was conducted using a survey method with a sample of 205 vocational schools teachers in both public and private schools. Data collection techniques were obtained by collecting data directly to the data source through questionnaires and interviews. Hypothesis testing as a follow-up to data collection is done through a verification approach using SEM by utilizing Lisrel program to test a series of influences be-

tween variables. SEM test is used because it can measure the effect between variables with high complexity values.

Based on the background explanation of the problem, the hypothesis proposed in his study consists of:

H_1 = TVET preparation has a significant effect on TVET impact.

H_2 = TVET implementation has significant effect on TVET impact.

H_3 = TVET competency has a significant effect on TVET impact.

RESULTS AND DISCUSSION

In this study analysis was developed using multivariate statistics through the implementation of structural equation modeling tests. Although the level of complexity for research is not yet high in the developed model, it also applies 4 variables tested with constructs that can be formed by various indicators that accompany it. Lisrel 8.8 program is used as a tool to conduct SEM analysis which is perceived as the most appropriate choice in doing the calculations in this study. Evaluation of the model needs to be tested first, it is necessary to find out whether the structural model formed is feasible for further analysis. Data in the form of a questionnaire recapitulation obtained from respondents totaling 205 met the requirements to conduct research so that the entire procedure was ready to be analyzed statistically.

Table 1. Respondent hracteristic

Profile	Respondent		
	Criteria	Number	%
Gender	Male	96	46.8
	Female	109	53.2
Age	< 30 years	27	13.2
	30 - 40 years	97	47.3
	40 - 50 years	59	28.8
	> 50 years	22	10.7
Education level	D3	2	1.0
	S1	197	96.1
	S2	6	2.9
Major in study	Engineering	98	47.8
	Economic	76	37.1
	Social	8	3.9
	Science	2	1.0
	Others	21	10.2

Table 1 shows that characteristics of respondents in this study are related to the implementation of TVET conducted in vocational high schools. Four criteria presented on the respondent's profile consist of gender, age, education level, and major study. In the gender data, it can be shown the number of male respondents as much as 96 and the number of female respondents is 109. From the data obtained it can be seen that respondents with female gender 53.2% have a greater number than respondents with

male gender 9%. At the age of respondents, it can be seen that respondents with ages between 30-40 years are the highest number of respondents chosen which is 97 or equal to 47.3%. While the number of respondents based on their education level, respondents with S1 education had the highest number of respondents, amounting to 197 or equal to 96.1%, because this relates to the requirement to be a teacher in a school that must already have a bachelor's degree. While the major in the study as a place where respondents teach, engineering is a major department involved in collecting respondents' data that is equal to 98 or 47.8%, this is because the most major population is engineering.

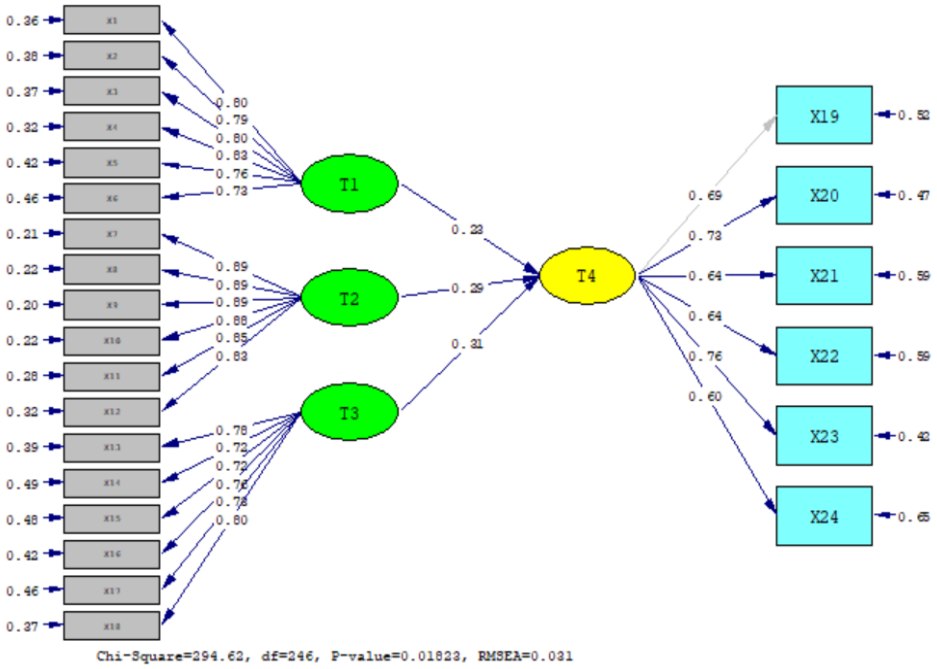

Figure 1. Standardized Solution of TVET

The resulting structural model shows the value of the influence of TVET preparation, TVET competency, TVET implementation which has an effect on TVET impacts to strengthen the education sector in Vocational Schools shown in Figure 1. The value of the effect of TVET preparation on TVET impacts is Υ_{11} = 0.23, this can be interpreted that TVET preparation can influence TVET impact by 23%, while other factors can influence the remaining 77%.

For the value of TVET competence effect on TVET impacts is $\Upsilon_{21} = 0.29$, so it can be interpreted that TVET competence can influence TVET impacts by 29% while other factors are 71%. And for the effect value of TVET implementation on TVET impacts is $\Upsilon_{31} = 0.31$, which means that TVET implementation can influence TVET impacts by 31%, while other factors influence 69 %.

The results of testing all three hypotheses carried out simultaneously in this study result that TVET preparation, TVET competence, and TVET implementation and all three have significant effect on TVET's impact on teachers in vocational high schools. The analysis results obtained can be revealed that collaboration agreement with industry as part of TVET preparation indicators has the greatest contribution so that it can determine its effect on TVET impacts. Likewise with TVET competence, the strongest indicator is applying standard operating procedures so that its contribution to influence TVET impacts is quite large. Whereas in TVET implementation, industry trainers provide feedback to be one indicator that has the biggest contribution in shaping TVET implementation so that it is directly able to influence TVET impacts.

Table 2. The goodness of Fit Index

Index	Goodness of Fit		
	Criteria	Result	Remark
GFI	≥ 0.9	0.89	Marginal Fit
NFI	≥ 0.9	0.95	Good Fit
NNFI	≥ 0.9	0.99	Good Fit
CFI	≥ 0.9	0.99	Good Fit
IFI	≥ 0.9	0.99	Good Fit
RFI	≥ 0.9	0.95	Good Fit
PNFI	0 - 1	0.85	Marginal Fit
AGFI	0 - 1	0.87	Marginal Fit

One way to conduct multivariate analysis so that it can analyze the influence between variables that have complex categories simultaneously is using SEM. SEM test results can be shown in the form of overall model fit, measurement fit model, and structural fit model. These three criteria are represented by some of these measurements including GFI, NFI, NNFI, CFI, IFI, RFI, PNFI, AGFI. Some criteria for the compatibility index from the measurement results of goodness of fit are presented in table 2. The index has a good of fit criteria value if the value is obtained ≥ 0.9, or index value measured is close to 1, especially AGFI and PNFI. The index has a marginal value if the value produced is $0.8 \leq GOF \leq 0.9$. The results of the goodness of fit test in this study used eight criteria with five criteria that were stated to have good goodness of fit including

NFI, NNFI, CFI, IFI, RFI. While the other three criteria declared marginal fit are GFI, PNFI, and AGFI.

Table 3. Result of Hypotheses

Hypotheses	t-value	Standardized Solution	Conclusion
H_1	2.88	0.23	Accepted
H_2	3.84	0.29	Accepted
H_3	3.84	0.31	Accepted

A hypothesis proposed in this study by utilizing four variables including TVET preparation, TVET competence, TVET implementation, and TVET impacts with the results stating that all three hypotheses tested have good significant values so that all hypotheses can be accepted based on table 3. All hypotheses tested have a value of $t > 1.96$ so that conclusions of this research hypothesis are significant. The greatest significance value is 3.84 which exists on two inter-variable influences, effect between TVET competence on TVET impacts, and effect between TVET implementation on TVET impacts. Two indicators that can make the contribution of TVET competence and TVET implementation important include implementing standard operating procedures and industry trainers providing feedback(Ismail et al., 2018)..

The novelty produced in this study is called SMK TVET model shown in Figure 2. SMK TVET Model emphasizes that TVET impacts are based on two important indicators that shape it, uses of skills and adequate living needs with entrepreneurs which are primarily directed to the development of vocational school curriculum can be according to various needs in the industry. Uses of skills for vocational graduates through mastering various competencies needed industry is the key to success of vocational schools to develop an educational curriculum to be utilized more optimally by implementing adequate education and training. Adequate living needs with entrepreneurs is a further step expected by SMK graduates to develop skills and competencies in working in industry with the aim not only to meet economic needs, but also to be able to improve their welfare and even be able to participate in supporting and competing with entrepreneurs(Geressu, 2017).

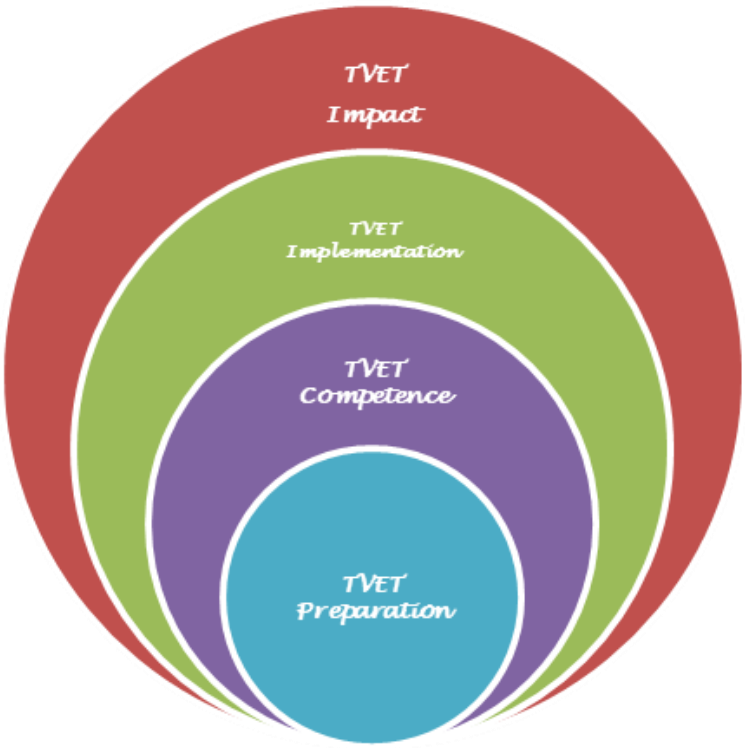

Figure 2. SMK TVET Model

CONCLUSION

The results based on verification analysis presented in this study were conducted in vocational high schools related to implementation of TVET in education system in Indonesia. The description of TVET explored in this study includes four variables developed from various study programs in vocational high schools including TVET preparation, TVET, competence, TVET implementation and TVET impacts. The result of this study concluded that TVET preparation, TVET, competence, and TVET implementation have a significant influence on TVET impact in implementing it at SMK. Adequate living needs with entrepreneurs has the biggest contribution in forming TVET impacts with hope that vocational graduates who have expertise related to TVET impacts will be able to meet their daily needs better and even become entrepreneurs to get brighter future. To carry out TVET preparation effectively, it is necessary to implement in-

dicators, especially collaboration agreements with industry in their implementation. While applying the standard operating procedure is an important contribution in the implementation of TVET competence. Likewise with apply of TVET implementation where the role of industry trainers provides feedback is needed to support the successful implementation of TVET for vocational high schools.

REFERENCES

Geressu, B. S. (2017). Impact of competence-based training on employability of Technical and Vocational graduates in Ethiopia. *Tuning Journal for Higher Education*, *5*(1), 101–119.

Grosch, M. (2017). Developing A Competency Standard For TVET Teacher Education In ASEAN Countries. *Jurnal Pendidikan Teknologi Dan Kejuruan*, *23*(3), 279–287.

Hamisu, M. A., Salleh, K. M., Sern, L. C., Adamu, B. Y., & Gambo, K. (2017). Proposed Competency Model for Technical and Vocational Education and Training (TVET) Lecturers Teaching in Technical Colleges, Bauchi State in Perspective. *Traektoriâ Nauki = Path of Science*, *3*(9), 5001–5009.

Hanimastura, H., Hairulliza, M. J., Tengku, S. M., & Tengku, W. (2016). Success factors for knowledge sharing among TVET instructors. *Journal of Theoretical and Applied Information Technology*, *85*(1), 12–20.

Ismail, A., Hassan, R., Bakar, A., Hussin, H., Hanafiah, M., & Asary, L. H. (2018). The Development of TVET Educator Competencies For Quality Educator. *Journal of Technical Education and Training (JTET)*, *10*(2), 38–48.

Muslim, S., Kusumawati, N., Ismayati, E., & Rahmadyanti, E. (2019). Theoretical And Empirical Studies Of The Use Of Problem Base Learning In The Technical And Vocational Education And Training (TVET) In The Context Of The XXI Century. *Indonesia Journal of Learning Education and Counseling*, *1*(2), 133–143.

Rajadurai, J., Mazuin, N., Daud, S., & Abidin, N. (2018). The Marketability of Technical Graduates from Higher Educational Institutions (HEIs) Offering Technical and Vocational Education and Training (TVET): A Case from Malaysia. *Asia-Pacific Education Research*, *27*(2), 137–144.

Suciati, P. (2018). Why Do Students Choose Vocational School ? Lesson Learned From

Indonesian Vocational Education. In *The 2nd International Conference on Vocational Higher Education (ICVHE) 2017 "The Importance on Advancing Vocational Education to Meet Contemporary Labor Demands" Volume* (pp. 725–745).

Sudira. (2018). *Metodelogi Pembelajaran Vokasional Abad XII*. Yogyakarta: UNY Press.

UNESCO. (2019). Recommendation concerning technical and vocational education and training (TVET). New York: UNESCO.

Verawadina, U., Jalinus, N., & Asnur, L. (2019). Kurikulum Pendidikan Vokasi Pada Era Revolusi Industri 4.0. *Jurnal Pendidikan*, *20*(1), 82–90.

Verawardina, U., & Jama, J. (2018). Philosophy TVET Di Era Derupsi Revolusi Industri 4.0 Di Indonesia. *Jurnal Filsafat Indonesia*, *1*(3), 104–111.

Yunanto, D. (2016). Implementasi Teaching Factory Di SMKN 2 Gedangsari Gunungkidul. *Jurnal Vidya Karya*, *31*(1), 29–36.