

Curriculum Adequacy on the Undergraduate Program of Building Technique-Faculty of Engineering-State University of Surabaya towards the Vocational High School



Suparji, Agus Wiyono, Lily Montarcih Limantara

Abstract:: This research aims to investigate the curriculum adequacy description of study program towards the curriculum of vocational high school at once to describe the deficiency. The competency skills of this research consist of the Concrete-Stone Construction, Building Drawing Technique, Survey and Mapping Technique. The data collection is carried out by collecting the documentation, interviewing, and the Focus Group Discussion (FGD) by using the check list instrument, the guidelines of interview and FGD. The methodology uses the descriptive-quantitative analysis by percentage. The result shows that the curriculum adequacy on the undergraduate study program of Building Technique Program towards the curriculum of the Vocational High School is in amount of 67.63% for the Concrete-Stone Construction, 16.60% for the Wooden Construction, 62.71% for the Building Drawing Technique, and 75.00% for the Survey and Mapping.

Keywords: high school curriculum, building-technique study program curriculum, curriculum adequacy

I. INTRODUCTION

The importance of skill and knowledge increasing of working generation for reaching or holding the economic competitiveness mainly to face the development globalization cause the educational and training system of vocation is as an important element of the economic development strategy of a country. Therefore, the role of vocational education and training is assumed as the key of economic development [1]. To discuss about the vocational education and training, it cannot be loosed from the Education Institution of Educational Staff (LPTK) as the printed institution of

professional educational staff for the educational staff candidate on the whole educational and expertise level.

The graduates have to reference to the national standard which is fitted with the characterization of high education. The figure of graduates has to be reflected in the curriculum of Education Institution of Educational Staff (LPTK) that will be become as the base of expertise development regarding to the strata of his/ her profession expertise such as the First Teacher, the Young Teacher, the Madya Teacher, and the Main Teacher. Therefore, to carry out the development of high education curriculum, the LPTK has to remain the concept of best graduate for the cognitive as well as the affective competence concept [2]. The candidate of graduate teacher from LPTK has to be able to carry out the curriculum in each school and to become as the actor in the class [3]. For the LPTK mainly the Faculty of Engineering, the graduates have to be able to implement the curriculum in the Vocational High School (SMK) and have the competence to carry out the research [4]. This condition obliged the curriculum of LPTK is able to become as the base of the development and the implementation of the Vocational High School curriculum. The curriculum is seen important to be developed regarding to the sociocultural and technological change from time to time in order to be able to fulfil the demand of the student and the society [5].

The curriculum of Vocational High School is often changed regarding to the business and industrial world demand. It is not too surprised because to fulfil the global competition and challenge, there is needed the significant improvement of the vocational education and the training instruction based on the curriculum design due to the certain characteristic [6]. To see how often the change of vocational curriculum, the Education Institution of Educational Staff (LPTK) has to be more dynamic due to the development which is happened, based on the National Qualification Scheme of Indonesia (KKNI) as the role of Indonesian human resources and labor as it is presented in the Government Rule No. 8/2012. There are two keywords in developing the Education Institution of Educational Staff (LPTK) such as the learning outcomes and qualification. The learning packaging achievement into the qualification level of the National Qualification Scheme of Indonesia (KKNI) is also important for the harmonization and cooperation of mutual recognition with the other country bilaterally as well as multilaterally.

Manuscript published on 30 September 2019

* Correspondence Author

Suparji*, Study Program of Building Technique, Department of Civil Engineering, Faculty of Engineering, State University of Surabaya, Indonesia Email: suparji@unesa.ac.id

Agus Wiyono., Study Program of Building Technique, Department of Civil Engineering, Faculty of Engineering, State University of Surabaya, Indonesia.

Lily Montarcih Limantara*, Department of Water Resources, Faculty of Engineering, University of Brawijaya, Indonesia. Email: lilymont2001@gmail.com

© The Authors. Published by Blue Eyes Intelligence Engineering and Sciences Publication (BEIESP). This is an [open access](https://creativecommons.org/licenses/by-nc-nd/4.0/) article under the CC-BY-NC-ND license <http://creativecommons.org/licenses/by-nc-nd/4.0/>

Curriculum Adequacy on the Undergraduate Program of Building Technique-Faculty of Engineering-State University of Surabaya towards the Vocational High School

To develop the curriculum based on the descriptor of educational qualification level, is needed the learning outcome level starting from the university learning outcomes until the program learning outcomes) and the course learning outcomes which are compared with the qualification level.

Therefore, it is important to understand how to formulate the learning outcomes for study program (which is mentioned as the graduates' competence standard (SKL) and the specific lectures standard [7] in order to reach the vision, mission, development, and the educational level in LPTK consistently. The descriptor of KKNI in every level consists of three outcomes which are hoped. First, the skill (cognitive and psychometric) which is owned by the students after they have finishes their lectures program. Second, the content knowledge which underlies the skills possessed sp they can adapt with the change in the future. Third, the managerial ability of the skill and knowledge that have been dominated in order to be developed regarding to the professional demand including the entrepreneur ability [8].

The study program of Building Technique Program (PTB) is one of the study programs which requires attending the content of curriculum because the graduate of the study program will become as teacher in some expertize competence in the High School Vocational that is the Concrete Stone Construction Engineering, Wooden Construction Engineering, Building Drawing Engineering, Survey and Mapping. This study program is demanding the mind set change from what will be taught by the teacher into the ability that has to be owned by the students including the work behaviour [2]. The breadth of coverage which has to be fulfilled by the study program of Building Technique Program (PTB) is demanding to carry out the evaluation of curriculum so the relevance stay maintained [9]. The postgraduate curriculum of Building Technique Program has to be designed based on the specific competence such as entrepreneur competence [8], the competence which is based on the market or business and industrial world [7]. It can be meant that the main orientation of Vocational High School graduates is to work or entrepreneurship independently regarding to their vocational field [8]. Therefore, the vocational education system is developed to be oriented on the system that is developed in the business and industrial world so the learning model at least closes to the situation and condition which is real in the business and industrial world and supports to carry out the carrier adaptation [10].

The educational reformation of vocational high school that has been rolled out, takes changes mainly on the development paradigm orientation of vocational high school which is market driven and based on the standard of applicable work competence in the industry and the graduates or drop out who is able to be working independently or entrepreneurship or filling the work formation in the field [8]. In addition, it is carried out to anticipate the occurrence of development and acceleration in the world technological and economical changes that is global and impact on the human resources demand which has the excellence and competence standard as required by the business and industrial world circles.

The vocational education has to be supported by the good or suitable curriculum regarding to the demand of business and industrial world. The applicable curriculum now is the curriculum 2013. On the vocational education, the curriculum 2013 is integrated with the spectrum 2017. The curriculum of

vocational high school 2013 describes field coverage of building that consists of the expert competence of Concrete Stone Construction Engineering, Wooden Construction Engineering, Building Drawing Engineering, Survey and Mapping [11].

The process of curriculum construction needs the basic data as the references. One of them is the curriculum adequacy of Education Institution of Educational Staff (LPTK) especially the study program of Building Technique Program (PTB) towards the vocational high school curriculum based on the competence which is owned as the reference for the curriculum relevance and development.

II, MATERIAL AND METHOD

This research uses the quantitative-descriptive research design by analyzing the curriculum content of Building Technique Program (PTB) postgraduate study program, Faculty of Engineering, State University of Surabaya which is related with the curriculum content of the related vocational high school. The analysis unit of this research is the curriculum of Building Technique Program (PTB) postgraduate study program and the curriculum of vocational high school on the competence of Concrete Stone Construction Engineering, Wooden Construction Engineering, Building Drawing Engineering, Survey and Mapping.

The technique of data collecting in this research consists of documentation, interview by instrument check list, and the interview guidance. In addition, it is carried out the activity of Focus Group Discussion (FGD). Then the data is analyzed by using the qualitative and quantitative analysis [12]. The first analysis is the quantitative descriptive one which is used for obtaining the curriculum adequacy. Then, the second analysis is the qualitative descriptive one which is used for describe the deficiency of curriculum, in what part is necessary to be added or reduced or removed.

III.RESULTS AND DISCUSSION

The curriculum adequacy on the postgraduate study program of Building Technique Program (PTB) towards the curriculum of vocational high school with the competence of Concrete Stone Construction Engineering is 67.63%. This adequacy is including the competence of analyzing simple construction, drawing the construction implementation, compiling construction cost budget, using the hand equipment and electrical mechanic on the stone and concrete construction, examining the building material, carrying out the construction measurement carrying out ironing work, carrying out concrete casting, and carrying out the building finishing. However, the competence that has not been in the study program curriculum is to manage the construction work, to carry out the scaffolding work, to carry out the printed concrete, and to carry out the highway work. The competence that does not exist yet is very important because it contents the practice in field so it has to be owned by the teacher candidate of vocational high school [13]. The curriculum adequacy of Building Technique Program (PTB) postgraduate study program towards the vocational high school curriculum of Wooden Construction Engineering is 46.60%.

This adequacy is including the adequacy in the competence of designing the wooden construction work, carrying out work drawing and the list of wooden construction work component, carrying out the wood connection, using the hand and electrical equipment, using the static mechanical tool, making sills, door, and wood window, and finishing the wood construction. However, the competence that has not yet fulfilled in the study program curriculum is the competence of analyzing the material need of wood construction work, building the wood easel horse, installing the scaffolding, installing the wood formwork, installing the timber frame and the wall cover from wood and partitions, installing the wood sills on the building, installing the door/ window on the wood sills, installing glass on the sills/ door/ window, installing the wood railing, installing the plafonds frame and cover, installing the simple portal system of roof frame and easel horse system. Some of these competencies are very important, remembering the competencies are demanding the student to be able to explore their ideas to accomplish their tasks [14].

The curriculum adequacy of Building Technique Program (PTB) postgraduate study program towards the vocational high school curriculum of Building Drawing Technique is 62.71%. This adequacy is including the competence to compile the manual drawing layout, drawing the design of bean reinforced concrete, drawing the floor construction and building wall, drawing the sills, door, and window construction, drawing the floor plat design, drawing the stairs construction, drawing the ceiling of the house construction, drawing the roof construction, and drawing the building utility. However, the competence that has not yet fulfilled in the study program curriculum is the competence of drawing the retaining wall, drawing the lay out of interior and exterior decoration, drawing the house, office, and public room interior decoration, applying the building interior and exterior design, applying the building finishing material and designing the room partition. The competencies can stimulate the student to be more creative. Being creative needs an open mind. Craft [15] mentions that creativity needs to be open for accepting the unknown and the unexpected facts or ideas, to connect between unconnected ideas and integrate different ways of thinking, to hold the paradox of form, to hold the tension between safety and risk and be willing to receive criticism.

Curriculum adequacy on the postgraduate study program of Building Technique Program (PTB) towards the curriculum of Vocational High School for Survey and Mapping is 75.00%. The result is aligned with the research result of Ridwan and Nafi [16] which presented that the curriculum relevance between study program and vocational high school is 78.57%. The adequacy of this research result is including the adequacy in the competence to understand the basic of survey and mapping, to implement the basic work of survey and mapping, to apply the basic of engineering drawing, to apply the safety and health of work, to understand type of optical measurement tool, to use the optical type tool, to apply the reading manner of signs measure, to apply the manner of measure list filling, to understand the manner of data collecting, to apply the vertical position measurement, to implement the horizontal position measurement, to carry out the topography mapping measurement, to carry out the civil engineering survey measurement, to apply the standard of measurement system, to analyze the data regarding to the standard which can be accepted for the certain need, to

converse the data from one system to the other system, to correct the truth of data, and to identify the consumer demand. However, the competence which is not available in the study program curriculum is to compile the budget plan of the survey and mapping cost, to optimize the functions of program calculator for the basic formula of survey and mapping, to determine the azimuth by sun observing and Geodetic Position System (GPS), to maintain the optical type tool, to implement the fotogrametry, and to make the mapping result of fotogrametry work. The competence which is not available, is due to the program study has not had the tool for carrying out the learning program which is aligned with the research result of Ridwan and Nafi [16] which presented that tool is becoming as an important thing in the study program curriculum Building Technique Program (PTB) especially the subject of Geodesy.

IV. CONCLUSION

Based on the data analysis and discussion above, the conclusion is as follow:

- a. The curriculum adequacy on the postgraduate study program of Building Technique Program (PTB) towards the Vocational High School curriculum with the expert competence of Concrete Stone Construction Engineering is 67.63%. The competence which has to be added is in managing the construction work, to carry out the scaffolding work, to carry out the printed concrete, and to carry out the highway work.
- b. The curriculum adequacy on the postgraduate study program of Building Technique Program (PTB) towards the Vocational High School curriculum with the expert competence of Wood Construction Engineering is 46.60%. The competence which has to be added is the competence of analyzing the material need of wood construction work, building the wood easel horse, installing the scaffolding, installing the wood formwork, installing the timber frame and the wall cover from wood and partition, installing the wood sills on the building, installing the door/ window on the wood sills, installing glass on the sills/ door/ window, installing the wood railing, installing the plafon frame and cover, installing the simple portal system of roof frame and easel horse system.
- c. The curriculum adequacy on the postgraduate study program of Building Technique Program (PTB) towards the Vocational High School curriculum with the expert competence of Building Drawing Technique is 62.71%. The competence which has to be added is the competence of drawing the retaining wall, drawing the lay out of interior and exterior decoration, drawing the house, office, and public room interior decoration, applying the building interior and exterior design, applying the building finishing material and designing the room partition.
- d. The curriculum adequacy on the postgraduate study program of Building Technique Program (PTB) towards the Vocational High School curriculum with the expert competence of Survey and Mapping is 75.00%.

AUTHORS PROFILE

The competence which has to be added is to compile the budget plan of the survey and mapping cost, to optimize the functions of program calculator for the basic formula of survey and mapping, to determine the azimuth by sun observing and Geodetic Position System (GPS), to maintain the optical type tool, to implement the fotogrametry, and to make the mapping result of fotogrametry work.



Suparji, Study Program of Building Technique, Department of Civil Engineering, Faculty of Engineering, State University of Surabaya, Indonesia Email: suparji@unesa.ac.id

Agus Wiyono, Study Program of Building Technique, Department of Civil Engineering, Faculty of Engineering, State University of Surabaya, Indonesia



Lily Montarcih Limantara, Department of Water Resources, Faculty of Engineering, University of Brawijaya, Jl. MT Haryono No. 167 Malang-INDONESIA, Email: lilymont2001@gmail.com

REFERENCES

1. M. Grosman, and R. Naanda, "Back to the Future? The Challenges of Reforming Vocational Education and Training", ESPC funded centre on Skills, knowledge and Organizational Performance, Oxford and Warwick Universities (SKOPE Publication), 2006.
2. Rospigliosi, A. Pericles, Bourner, Tom, and H. Linda, "Universities' Engagement with Vocationalism: Historical Perspective", International Journal for Research in Vocational Education and Training (IJRVET) Vol. 3, Issue 3, December 2016, 185-211.
3. Lecours, Alexandra, and P.Y. Therriault, "Supporting Vocational Students' Development of Preventive Behaviour at Work: A Phenomenological Analysis of Teachers' Experiences", International Journal for Research in Vocational Education and Training (IJRVET) Vol. 4, Issue 1, April 2017, 20-46.
4. V. Aarkrog and B. Wahlgren, "Developing Schemas for Assessing Social Competences among Unskilled Young People", International Journal for Research in Vocational Education and Training (IJRVET) Vol. 4, Issue 1, April 2017, 47-68.
5. I.O Onwe and F.A. Opa, "Implementing the universal basic education curriculum for national development and quality assurance in Nigeria", Women in colleges of Education Ebonyi State Chapter Multi-Disciplinary Journal (Maiden Ed.) 223-233, 2013.
6. S.G. Mouzakitis, "The role of vocational education and training curricula in economic development", Procedia Social and Behavioral Sciences (2): 3914-3920, 2010.
7. E.C. Papakitsos, "Systemic Modelling for Relating Labour Market to Vocational Education", International Journal for Research in Vocational Education and Training (IJRVET) Vol. 3, Issue 3, December 2016, 166-184.
8. Zenner, Lea, Kumar, Kothandaraman, and M. Pilz, "Entrepreneurship Education at Indian Industrial Training Institutes – A Case Study of the Prescribed, Adopted and Enacted Curriculum in and around Bangalore", International Journal for Research in Vocational Education and Training (IJRVET) Vol. 4, Issue 1, April 2017, 69-94.
9. H. Hiim, "Ensuring Curriculum Relevance in Vocational Education and Training: Epistemological Perspectives in a Curriculum Research Project", International Journal for Research in Vocational Education and Training (IJRVET) Vol. 4, Issue 1, April 2017, 1-19.
10. Ebenehi, S. Amos, Rashid, M. Abdullah, and A.R. Bakar, "Predictors of Career Adaptability Skill among Higher Education Students in Nigeria", International Journal for Research in Vocational Education and Training (IJRVET) Vol. 3, Issue 3, December 2016, 212-229.
11. Kementerian Pendidikan dan Kebudayaan, "Kurikulum SMK 2013", Jakarta: Depdikbud, 2013.
12. J.W. Creswell, "Research design: Qualitative, Quantitative and Mixed Methods Approaches". London: Sage Publications, Inc., 2014.
13. L.W. Anderson and D. Krathwohl, "A taxonomy for Learning, Teaching, and assessing: A Revision of Bloom's Taxonomy of Educational Objectives", New York: Longman, 2001.
14. S. Courter, "Strategies for Effective Teaching: A Handbook for Teaching Assisstant", Madison: Office of the Associate Dean of Academic Affairs College of Engineering University of Wisconsin, 1996.
15. A. Craft, "An Analysis of Research and Literatur on Creativity in Education: Report prepared for the Qualifications and Curriculum Authority": www.creativeallis.com/uploads/2/2/8/7/2287089/creativity_in_education_report.pdf. Downloaded April 3, 2014, 09:12 pm.
16. M. Ridwan and M. Nafi, "Relevansi Kurikulum Ilmu Ukur Tanah PTB Ftunesa Dengan Kurikulum Geomatika SMK dan Kompetensi Yang Dibutuhkan Di Dunia Industri", Jurnal Kajian PTB Vol 3 Nomer 3/JKPTB/15: 171 – 176, 2015