Challenges In Developing Work-Based Learning Among Diploma III Automotive Engineering Study Program, Faculty Of Engineering, Universitas Negeri Yogyakarta

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Abstract. Industrial development has been more challenging the technological and vocational education to strengthen their relevance with employment. Partnership with industry becomes the top priority that should be continuously pursued in order to optimize the learning process. One of the ways for continuously pursuing the optimization might be the Work-Based Learning (WBL). In relation to the statement, the study aims at identifying the obstacles within the implementation of WBL among the students of Diploma III Automotive Engineering Study Program, Faculty of Engineering, Universitas Negeri Yogyakarta and at identifying the impacts of WBL implementation on the students' learning process. While the study was conducted, the data were gathered through in-depth interview, questionnaire distribution and field observation. Then, the data that had been gathered were analysed using the qualitative descriptive analysis technique. The respondents who had been involved in the conduct of the study were the university students who underwent their internship program in 2017 and also the Workshop Head and mentor from the partnering companies of automotive industry around the Province of Yogyakarta Special Region and the Province of Central Java. The results of the study show that several obstacles have been found in the following aspects: (1) partnership development with the industry; (2) duration and timing of implementation; (3) activity guideline; (4) evaluation instrument; and (5) monitoring and supervision by the lecturer. On the other hand, the impact of WBL implementation on the students' learning process is that the WBL enforces the creation of ideas that might be useful for their development in the subsequent assignments.

1. BACKGROUND

For vocational education, following up the development of science and technology is one of the main keys in preparing the ready-to-work graduates. Vocational education is focused on the attainment of knowledge, skills and value systems within the employment in order to improve job productivity, to increase salary and to pursue socio-economic development [1]. In order to achieve it, vocational education should prioritize the learning system development that has orientation toward the improvement of totally professional and relevant graduates with good job ethics, high discipline and high appreciation on national culture. Through such efforts, it is expected that the quality of vocational education graduates will be able to deal with the job challenges and to embrace the job opportunities according to the employment needs

both in the domain of industry and in the domain of entrepreneurship. This situation definitely provides signal to the institutions of vocational education that they should continuously improve the quality and the relevance of the graduates.

Unfortunately, there are several obstacles that should be overcome in increasing the quality standards and the quality of access; these obstacles might be, for example, the insufficient budget for facility development, the incomplete information on the availability of training and fragmentation program for the conduct of vocational competency, the weak information network between the providers of training institutions (institutions of vocational education) and the users of training institution graduates (industry) and the weak capacity within the institutions of vocational education. These obstacles certainly become the hindrance within the development of vocational education [2]. Those conditions describe the internal and the external weakness within the institutions of vocational education in terms of learning process management. The insufficient training facility will hinder the learning process and thus will influence the product quality. In the same time, the weak information network implies that the partnership with the industry domain or the employment domain has not been optimum.

The technology innovation and the global market competition do not only result in the permanent changes of job organization that highly demands flexibility and mobility but also challenge the educational system and the formal training program in order to provide modern qualification and knowledge "just-in-time" as a response toward the employment demands [3]. The problems of equivalence between the vocational education and the industrial company are still apparent both qualitative and quantitatively. Qualitative equivalence occurs because the technology development within the industry has been taking place in such a way that the technology developments creates the gap of competence between the vocational education graduates and the industrial company. On the other hand, quantitative equivalence occurs because there is a gap between the number of available employment and the number of vocational education fresh graduates [4]. As a result, the important expectation on the graduates, namely to gain link and match with the employment needs over the time, will be more irrelevant.

Technological adjustment certainly has consequences on the high funding due to the expensive new technology facility and the low accessibility by educational institutions. Learning process collaboration between educational institutions and industrial companies certainly can be a proper solution for such problem. Kohler [5] states that the relationship between vocational education and training (VET) and employment market becomes crucial for the development of professional labours. Furthermore, Hollander &Mar [6] state that the improvement of relevance and the equivalence of vocational education/TVET to the trend of economy and employment are highly important for a successful TVET system, which might be afforded through a more intense involvement between the social partners and the stakeholders within the policy, planning, administration and implementation of TVET. The social partnerships for the development of TVET appears as the top-priority issue for the leaders of TVET.

In order to support the efforts of the development, one of the cooperation forms that might be pursued between the educational institutions and the institutional domains might be the implementation of Work-Based Learning (WBL), namely a learning process that engages or involves the students in the real employment so that the students might understand the demands of the job competencies, might experience directly the job culture and might identify the career opportunities. WBL as a learning approach plays a role in improving the development of profession and learning [7], in processing the transfer of concepts and skills through problem-solving activities in the working place based on the academical skills [8], and in serving as an optimal solution for anticipating the development in the rapidly changing employment

market [9]. In addition to the competence development, WBL assists the students in developing their social, academic and personal skills that might be necessary for: (a) living as a productive community member; (b) exploring and participating in the real working experience; (c) developing healthy and realistic job habits; and (d) developing entry-level skills in a job [10]. Then, the situation in the job workshop might be marked by time pressure, needs of productiveness development and profit in addition to the job reality [11]. The direct learning process in the working place becomes an opportunity for the students to understand and master technological development, the demands of employment market on the minimum job competence and the pressures in the working environment as a competence reality for the labours.

The model of WBL implementation might be very various depending on the form of educational institution engagement such as industrial visit, internship, job practice, on the job training and alike. The WBL implementation in a number of countries is adjusted to the governing policy, culture and curriculum. The WBL implementation with these various forms, that have been performed by the institutions of vocational education, should have been able to overcome the problems of relevance with employment. With the adjustment of objective, the adjustment of curriculum design, the sufficient staff support and the appropriate evaluation WBL might bring about positive impacts [12] [13].

There are four key factors that define the high quality of WBL program: (1) the WBL program should be well-structured and be integrated into the school curriculum and should also be well-inclined toward the product or the service that has been demonstrated in the learning process; (2) the students should have meaningful opportunities and engagement into the provided experience and should also have description on learning seriousness; (3) the leaders in the working environment should be able to deliver the learning objectives to both the instructors and the students; and (4) the WBL program should have strong relationship with the employment market in order to meet the employment needs [8]. The implementation of the four factors will result in the students' direct engagement into their job (hands-on), the joint program planning between the universities and the industrial companies based on the employment needs (relevance) and the strong relationship between both institutions as partners [14].

A successful partnership might be described as the results of well-qualified cooperation between both institutions and a successful partnership basically depends on the good relationship and communication among the key figures in both parties [15]. A partnership does not have to generate direct financial benefit. The educational institution caretakers and the industrial partners might keep affording their aspiration as a form of "win-win solution." The optimum benefit of cooperation through WBL partnership might provide mutual benefit for both the industrial companies and the universities, including the students as the learners. Therefore, partnership technological and vocational education is also a necessity.

The implementation of Industrial Practice as a form of WBL implementation in the Automotive Engineering Study Program, Faculty of Engineering, Universitas Negeri Yogyakarta also demands partners from automotive-related industry. The existing conditions imply the difficulty in establishing ideal partnership with the industry and the competition among the students in looking for the appropriate working place as the WBL partner. Not to mention, the efforts of establishing continuous partnership in both parties are still low. In addition to the absence of regulations that obliges the industry to perform WBL with the institutions of technological and vocational education, the benefits that have been gathered from the partnership have not been able to meet the needs of both parties. This condition is certainly less profitable for the institutions of vocational and technological education.

2. METHOD

The study investigated the model of WBL implementation on Diploma III Automotive Engineering Study Program, Faculty of Engineering, Universitas Negeri Yogyakarta. The study was a qualitative descriptive research which aimed at: (1) identifying the obstacles within the implementation of WBL learning model in the Diploma III Automotive Engineering Study Program, Faculty of Engineering, Universitas Negeri Yogyakarta; and (2) identifying the impacts of WBL learning model implementation into the students of Diploma III Automotive Engineering Study Program, Faculty of Engineering, Universitas Negeri Yogyakarta. The study was conducted from August until December 2017 in the Province of Yogyakarta Special Region and the Province of Central Java. The respondents in the study consisted of the students from the Automotive Engineering Study Program who had completed their internship program, the workshop heads and the industrial practice mentors in the workshop who became the partners of the students and the industrial practice coordinators in the university. The data were gathered by means of in-depth interview, field observation, questionnaire distribution and Focus Group Discussion. Then, the data were processed and analysed using qualitative techniques.

3. FINDINGS AND DISCUSSIONS

The WBL implementation in the Automotive Engineering Study Program takes the form of Industrial Practice, namely an internship program in certain industrial company that takes place around 256 hours or around one and a-half until two months. The industrial partners are the industrial companies that operates in automotive maintenance or alike. The conduct of the Industrial Practice takes place the break between the fourth semester and the fifth semester (the beginning of the third academic year) in accordance to the regulation that Industrial Practice should not be implemented altogether with the regular classes. The overall activities of Industrial Practice are divided into three stages namely preparation, implementation and evaluation.

Then, the WBL model that has been implemented up to date refers to the model by Siswanto as follows:

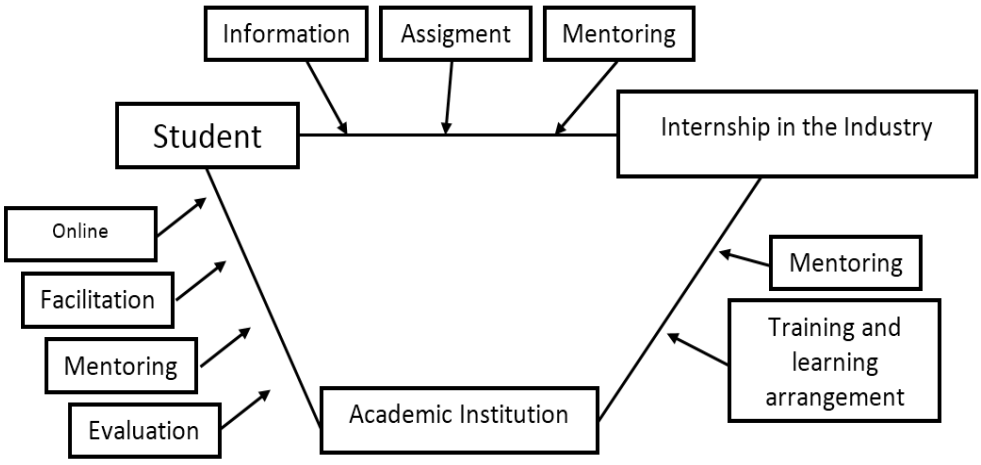

Figure 1. Application of Integrated WBL Model in Diploma III Automotive Engineering Study Program (Siswanto, 2015)

From the analysis on the data that have gathered by means of interview, the findings will be explained in the following sections.

3.1. Model Implementation

The WBL implementation provides contribution toward the students' learning process. The direct involvement in the job is deemed providing huge contribution from the aspects of the students' knowledge, skills and soft-skills. Several arguments in relation to the model implementation are as follows:

"In my opinion, Industrial Practice provides more contribution both in terms of knowledge and in terms of practice" (NAU). "The conduct of Industrial Practice is highly beneficial since we learn sufficient theory in the campus and now we have the actual opportunity to apply the theory into the practice" (MSF).

The learning experiences in the working place proves to be an important key in meeting and developing the relevance between the vocational and technological education and the employment. Based on the interview results as well, several obstacles that might be important to highlight are gathered.

3.1.1. Selection of Industrial partners

The students select the industrial partners based on the experience of the previous Industrial Practice, the information from the lecturers and the independent information. The institution does not specifically select the industrial partners; however, the institution provides the specifications on the characteristics of a sufficient industrial partner. The information that has been provided by the caretaker of Faculty of Engineering Universitas Negeri Yogyakarta is as follows:

"The criteria for selecting the sufficient industrial partner are: (a) the industrial company operates in the production of goods and/or service; (b) the industrial company is an entity that has business license issued by the governing authority; (c) the industrial company is relevant to the scientific field of Automotive Engineering Study Program; and (d) the industrial company is willing to accept and guide the students from Industrial Practice program" (BS).
"The industrial partners for the conduct of Industrial Practice should be official workshops/dealers of autocar manufacture, partnering workshop of autocar manufacture or general automotive workshop that has production capacity (automotive goods and service) who would like to employ the students from Industrial Practice program" (YE).

In general, the characteristics of industrial partners are already relevant to the automotive domain although several students state that these industrial partners have not met their expectation. The conduct of Industrial Practice should have orientation toward developing individual talents and interests in addition to meeting the credits. Then, in relation to the conduct of Industrial Practice some of the students provide their comments below:

"My choice already meets my domain. My knowledge as well as my skills about workshop is increasing and the experiences that I have attained from the conduct of Industrial Practice encourage me to learn more diligently in the campus" (PRT).
"The workshop where I have completed my Industrial Practice already meets my domain. However, I would like to be an entrepreneur in the domain of automotive engineering and I would like to learn how to set up a workshop. Unfortunately, I have not attained sufficient information about it. I attain the information about the management of a workshop itself from previous literatures" (RZ).

The development of students' talents and interests should be accommodated through WBL program by pursuing effective communication among the students, the lecturers and the industrial companies especially in selecting the sufficient industrial partners for the sake of improving the WBL benefits alone. The learning process in the working place is expected to develop the talents and the interests of an individual specifically in order to support his or her carrier in the future. Therefore, the selection of industrial partners should accommodate the expectation of the program participants and should also consider the availability of facilities and resources in the target industrial partners.

3.1.2. Development and Planning of Students' Activities in the Working Place

Within the conduct of the Industrial Practice, most of the activities in the working place are defined by the management of the industrial companies. For the huge-scale industry companies, the learning activities for the students have been well planned in terms of allocation on working region, working time and activity evaluation. As a result, the students' competence-based learning management has not been fully accommodated. In addition to obeying the management policy in the working place, the students are also trapped into the attraction of new technology mastery on the application into vehicle (working domain). The managerial aspects are often abandoned and are even left behind as having been stated by the workshop heads and the mentors as follows:

"The students have not had well-planned activities; as a result, we should provide them with program initiatives such as Management Trainee (MT) that has been applied in our company" (BWY).
"In our working environment, the internship programs for the university students have not been planned yet. The only available internship programs are intended to the vocational high school students in accordance to the regulations issued by the central government" (BDI)
"Many participants of the internship program would like to master the domain of vehicle engineering repairment only and they show less interest on learning the managerial aspects of our company. The students have not completely understood the duties that they should perform when they will be working based on the level of their education" (ARS).
"The students are more interested in mastering new technology on vehicles; as a result, they do not realize that their activities in mastering the new technology are not different that the internship programs for the vocational high school students" (MHF).

Departing from the interview results, the university should design more detailed program guideline for the students, the industrial companies and the academic advisors. The collaboration with the industrial partners in designing the guideline is necessary in order to adjust the program to the available capacity and facility. Therefore, the draft for the memorandum of understanding should be improved from both the aspects of content quality and the partner quantity.

3.1.3. Time and Duration

The duration of Industrial Practice conduct is around one and a-half or two months depending on the agreement between the students and the industrial partners. Then, the students argue that 256 hours are only sufficient for the introduction of developing industrial technologies; as a result, the learning process for the workshop management demands longer time. Most of the students propose that the Industrial Practice should be conducted around three months. On the other hand, several industrial partners describe that two-month period is only sufficient for the students to learn and to engage into the industrial activities. Therefore, the two-month period will be insufficient for understanding the overall industrial activities. The situation can be described by the following comments from several workshop heads:

"Within two months, the students will only be able to learn the operational service area. The analysis and diagnose area demand longer period of learning. I wish that the conduct of Industrial Practice will not be limited to certain period of time. Off the record, we can accept the Model Day Release" (BWY).
"The first week until the second week is an orientation period. After one month, the students are only able to run the regular service program and yet they are still under the supervision of our mentor. In order to master the competencies on the other domains, I would like to suggest that the conduct of Industrial Practice should be at least four months" (ARS).
"We provide training programs on special service activities. Unfortunately, by the time the students have been experience the period of Industrial Practice conduct has ended. From the aspect of Man Power, we do not gain direct benefit from such internship program" (BY).
"Several students have good basic skills and knowledge. We are interested to offer longer period for the conduct of Industrial Practice but the problem is that the students should return to their university at the end of the Industrial Practice. It is quite unfortunate that the students cannot engage themselves more in dealing with special cases and in learning the process on the domain other than service" (IDR).

In addition to the duration of Industrial Practice conduct, the timing of the internship program implementation should be considered. The competition between the vocational high schools and the universities in looking for the industrial partners for the conduct of WBK program is so intense that there should be more serious efforts in developing curriculum partnership and adaptation. Such situation has been described by one of the workshop heads in Nissan:

"There have been many proposals of internship programs but we are unable to grant those proposals altogether in the same time. On the other hand, in certain periods none of the students have proposed their internship program proposal to us. Day Release might be applied in Nissan since both theory and practice will go hand in hand. The conduct of in-and-out model for every two weeks will be better in comparison to the block model.

3.1.4. Supervision by Lecturers

The students' daily activities are related to the direct engagement within the production activities so that the mechanics/the workers in the workshop might play their role as a mentor. The appointment of the mentors who guide the students during the conduct of Industrial Practice depends on the policy of each industrial partners. For example, the workshop head might be the direct supervisor or the workshop head might appoint the leader of each division in which the students have been conducting their internship program as the mentor. The supervision process runs effectively in the working place although the process might be influenced by the students' activeness in benefitting the mentors' guidance. Such situation has been described by one of the mentors as follows.

"What the students have been lacking of is communication, creativity and mostly unwillingness to perform problem analysis" (AS).

Not all academic supervisors are able to conduct direct supervision in the Industrial Practice sites due to the remote access and the number of lecturers who have been facilitated (funded) by the Faculty of Engineering Universitas Negeri Yogyakarta. Consequently, there has not been any direct interaction between the lecturers and the managers/the staffs of the industrial companies, including the supervision toward the students. The situation has been described by the interview results with a mentor from the industrial partners:

"Teachers or academic supervisors never raise any question about the materials that have been provided to students by the workshop, the weakness that the students might have and alike" (ARS).

The supervision process during the conduct of Industrial Practice is performed by benefitting modern communication facility (Internet) or by pursuing direct communication in the campus. The supervision process runs effectively after the conduct of Industrial Practice has ended, especially during the report compile in the campus.

3.1.5. Activity Evaluation

The Industrial Practice evaluation is performed by the industrial companies and the university. The evaluation by the industry is performed at the end of the activities along with the provision of feedback through a form that has been provided by the Faculty of Engineering Universitas Negeri Yogyakarta. Based on the policy or the initiative of the management, the industrial partners provide their own evaluation on the students' competencies based on the students' learning experiences. On the other hand, the evaluation by the academic supervisors becomes the final part of Industrial Practice conduct.

The Industrial Practice program does not have any evaluation instrument yet whereas the evaluation instrument is important for measuring the students' competence achievement. Then, the existing assessment form contains soft skill assessment although some industrial partners does not consider soft skills as an important element for their workers. Therefore, evaluation instrument becomes common needs between the educational institutions and the industrial companies as a tool for measuring the successful implementation of WBL program.

3.2. Impacts of WBL Program for the Development of Students' Learning Process

The knowledge and the skills that have attained during the Industrial Practice activities by almost all of the respondents in the study serve as a learning experience that strongly supports and contributes to the subsequent course assignments. The courses that are related to the conduct of Industrial Practice consist of Vehicle Diagnosis, Industrial Management and Final Project. The field experiences result in developmental ideas that might be beneficial for the students. industry as a working site is very potential to manifest the students' Final Project assignments. The example of such aspiration is implied by several students as follows:

"There are many facilities that has been insufficient for the conduct of final project. I still have to wait for the lecturer's approval" (AGN).
"In certain jobs, mechanics should be assisted by their partners. If we devise an assistance tool such as washer-adjustment then the mechanics might work independently. Unfortunately, I have limited time and fund and due to that situation I have to think about other titles for my Final Project" (MTF).
"I have new experience and understanding for supporting the subsequent courses in the campus such as Final Project and Industrial Management" (RMD).

The developmental ideas that the students have attained during the internship program are an important element of WBL conduct [17]. WBL might be constructed by means of learning project, which has orientation toward the future needs of both the students and the organizations.

4. CONCLUSIONS

The implementation of WBL in the Automotive Engineering Study Program, Faculty of Engineering, Universitas Negeri Yogyakarta, still demands revisions starting from the administration system until the

quality improvement and the partnership expansion. The selection of industrial partners should accommodate the expectation on individual development, in addition to meeting the credits, in order to support the students' career in the future. Then, the collaboration between the university and the industrial partners should be strengthened by involving the industrial partners into the program planning, the communication intensity and the evaluation. Then, with regards to competence, the students already meet the minimum requirements but there should be more development on the soft skills.

Next, the duration of Industrial Practice conduct is still insufficient. The timing of Industrial Practice conduct should be reconsidered so that the Industrial Practice conduct will be continuous and be meeting the industrial expectations for the improvement of WBL product quality. Furthermore, the implementation guideline should be designed more specifically in order to serve as a matter of reference for all components that have been involved. The evaluation of Industrial Practice conduct also demands additional instrument especially for the hard-skill assessment. On the contrary, the lecturer visitation to the industrial site gains positive response and the visitation is beneficial for the development and the improvement of the program.

Last but not the least, the students gain further support for their learning process from their learning experiences in the working environment. Several cases that occur in the workshop open the opportunity for the learning project development. The most important key is the necessity to strengthen the partnership from both the aspects of quality and the aspects of quantity. Thereby, the results of the study strengthen the results of the previous study [18], which also asserts the importance of pursuing continuous partnership as the fundamental needs. In addition, the Automotive Engineering Study Program, Faculty of Engineering, Universitas Negeri Yogyakarta should be able to continuously develop the curriculum in order to accommodate the development in the employment.

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