A Feasibility Study on a Partnership Model Between Vocational High Schools, Industry and Workplace Based Core Strategies

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Abstract. This study aims to examine the feasibility of the partnership model of a vocational high school with the Core Strategies-based Business and Industry. The research method uses Plomp stages development of Research and Development (R & D) approach. The research site is Makassar City Public Vocational High School in industrial electronics specialization. The collected data are analyzed using descriptive statistics. The results of the research are: (1) description of Business and Industrial World partnership model activities in curriculum development, industrial practice, in house training, on the job training for students and teachers; (2) Analysis of the problems in partnering: (a) the program has not run optimally, (b) the work unit is not yet appropriate, (c) the contents of the memorandum of understanding have not been fully realized, (d) the partnership activities are unclear, (e) graduate competencies have not been absorbed, (e) graduate competencies have not been traced, f) there are no legal basis yet; (3) The partnership model design has 7 (seven) components including (1) government policy, (2) core strategy, (3) Vocational school policy, (4) industrial management, (5) service principles, (6) graduate competency, and (7) the employability of vocational high school graduates. Also, the feasibility study results of the partnership model have met the validity criteria.

Keywords: Feasibility Study, Model of Partnership, Core Strategies

1. Introduction

The development of the 4.0 industrial revolution has shown changes significantly in all fields. Industrial Revolution 4.0 is a comprehensive transformation of all aspects of production in the industry through the incorporation of digital and internet technology with conventional industries [1]. [2] Emphasizes the definition as the speed of information availability in an industrial environment where all entities are always connected and able to share information. Furthermore, [3] adds that the term industry 4.0 refers to a set of technology and a chain organizations in the form of Smart Factory, CPS, IoT, and IoS. It influences all activities in governance, socio-culture, and education. It has an impact on available jobs in the Business and Industrial World (BIW). The work which using manually processing to operate industrial equipment changes to the use of automation systems with computer control. The rapid change also influences the education world, especially the learning paradigm from expository learning to 21st century learning with 4C (Collaborative, Creative, Critical Thinking, and Communicative). Learning with the 4C concept develops the higher order thinking skill of students to be able to see job opportunities in the 21st century. The changes needs to be followed by the graduates’ skill in choosing a work based on their competence.
In Vocational High School (VHS) level, the partnership model between the VHS and the BIW developed. It shows a relevant curriculum in order the graduates to have industry-standard competencies. Other activities include conducting industrial work practices or industry internships. It allows the students and vocational graduates improve their competency. Therefore, the students have an equipment before working at BIW.

This partnership model was developed to facilitate programs between VHS and BIW in order strengthening each other, providing mutual benefits, mutual need, and building trust each other [4]. In partnership, the friendship, the cooperation, the relations each other are developed [5]. In this regard, the government has launched a revitalization of vocational education to increase the number of skilled workers in the 21st century. The VHS and BIW partnership model has been developed. Therefore, the feasibility of a model needs to be studied in depth to produce an effective partnership model framework. The feasibility of a model is assessed based on 3 (three) indicators, namely: (1) valid, (2) practical, and (3) effective [6].

2. Research Method

This study uses the R & D (Research & Development) approach using Plomp with 5 (five) stages: (1) Initial Investigation, (2) Design, (3) Realization, (4) Test, Evaluation, and Revision, and (5) Implementation. The Plomp’s approach allowed the developed model to be investigate in the beginning, developed the model, revise and test the model, and, as the last, the model being implement in broader area. Plomp method is systematic, which started with initial investigation and was end with product / model implementation. This research was conducted from the beginning investigation, design phase, test phase, evaluation, and revision. The object of this study is public VHS located in Makassar focused on industrial electronics expertise. The data were analyzed using descriptive statistics method.

3. Result and Discussion

The results of the study are divided into 4 (four) parts: the initial investigation, the design, the implementation, and the test, evaluation, and revision phases.

3.1. Initial Investigation

The partnership model between VHS and BIW as a part in establishing partnerships is very necessary in developing students and graduates’ competencies. The partnerships consist of curriculum development, industrial practices, in house training, on the job training, and internship of students/teachers.

The interview shows some problems in the partnership: (1) the program has not run optimally, (2) the work unit is not yet appropriate, (3) the contents of the memorandum of understanding (MoU) have not been fully realized, (4) the partnership activities are unclear, (5) there are no legal basis yet, (6) lack of concern, (7) industrials competition, (8) the collaboration between vocational school and BIW in all fields.

3.2. Design the Model

In designing the partnership model, it uses core strategies: (a) the industrial characteristics and the MoU that have been established based on needs analysis, and (b) the purpose of the MoU. The purpose of the partnership between VHS and BIW are increasing the knowledge, attitudes and skills of students in terms of real competence needed in BIW. The partnership also are built based on mutual needs, trusts, reinforcements, and benefits in order to improve the competence of students in vocational schools and productiveness of the teachers.

This partnership model developed strengthening the competence of VHS graduates to work in BIW. There are some aspects need to be considered: (1) partnership topics, methods, and techniques used by participants which consist of partnership modules, textbooks, partnership model guidelines, (2) the process of implementing partnerships plays an important role in formulating instruments used to determine validity, effectiveness, and practicality of partnership models.
The model process includes the implementation of partnerships and evaluation of partnership programs. The partnership program pays attention to the contents of the MoU which contains programs implemented by VHS and BIW: (1) teacher internships, 2) curriculum synchronization and validation, 3) competency testing and certification, 4) recruitment of workers, 5) internship, and 6) industry visits. Therefore, the partnership model design has 7 (seven) components including: (1) government policy, (2) core strategy, (3) Vocational school policy, (4) industrial management, (5) service principles, (6) graduate competency, and (7) the employability of VHS graduates.

3.3. Implementation

This phase is the implementation of the model design by compiling: model syntax, social system, reaction principle, support system, and impact of the model.

3.4. Tests, Evaluations, and Revisions

3.4.1. Validation of the textbook (model book)

The assessment aspect of the module format is 3.8 (valid). The content aspect is 4 (valid). The language aspect is 4.3 (very valid). Aspects of benefits/usability of the book is 4 (valid). Furthermore, the model book display is 5 (very valid).

3.4.2. Validation of model guidelines

The results of the model guideline assessment show in very valid categories. However, there are several aspects that need to be revised. The model guidelines need to be more attractive; the contents of the guideline need to be brief, solid, and meaningful, and the language need to be clearer.

3.4.3. Validation of the partnership model instrument

3.4.3.1. Partnership model instrument

The instruments for observing students’ activities and teacher internships are arranged based on students’ activities during the partnership process. This activity assessment is used to determine the effectiveness of the model. It encourages all parties to maintain the continuity of the partnership program. The results of the validation concluded that the average overall indicator of the activity of teacher and students was average 4.1. It indicates that the overall indicator is in a very valid category.

3.4.3.2. Pre-test and post-test

Validation of pre-test and post-test instruments in terms of three aspects: goals, construction, and language. The results of the validation show that these aspects are in the valid category so that they can be used in the implementation of the program.

3.4.3.3. Practicality validation instruments

This validation used to measure the practicality of the partnership model between VHS and BIW based on the core strategies. This instrument is a questionnaire in response to participants, teachers, and instructors in VHS and BIW. The results of the instrument validation is in very valid ratings. While the instructor response instrument shows that the instrument is in the valid category.

3.4.3.4. Validation of Components of the Partnership Model

Validation of the partnership model component aims to validate the indicator aspects of the model components. The component model consists of 7 (seven) components, namely: (1) government policy, (2) core strategy, (3) Vocational school policy, (4) industrial management, (5) service principles, (6) graduate competency, and (7) the employability of VHS graduates. The validation results in Table 1. The average validation value is 3.8. It meets the valid category. Therefore, it is feasible to be used in the next stage.
Table 1. Validation of Components of the Partnership Model

| No. | Indicator                        | Average Score | Information |
|-----|----------------------------------|---------------|-------------|
| 1.  | Government policy                | 4             | Valid       |
| 2.  | Core strategy                    | 4             | Valid       |
| 3.  | Vocational school policy         | 3,5           | Valid       |
| 4.  | Industrial management            | 3,5           | Valid       |
| 5.  | Service principles               | 4             | Valid       |
| 6.  | Graduate competency              | 3,8           | Valid       |
| 7.  | The employability of vocational school graduates | 3,5 | Valid |
|     | Mean                             | 3,8           | Valid       |

4. Discussion

The feasibility study of the model aims to produce a model that meets the criteria to be implemented in VHS and BIW. Likewise, the partnership model between VHS and BIW based on core strategy is designed using the Plomp’s approach. The model design results are then tested for feasibility. The partnership model, device model, and instrument meet valid criteria. [7] states that partnerships have become the means needed to train unskilled workers and renew the skills needed for the current workforce. [8] showed that the implementation of the VHS partnership management model based on existing new industries produced 62.5% ready-to-work graduates. It was the low category, even though the partnership program was done with an average score of 3.17 (in a good category). 37.5% of VHS graduates in the Mechanical Engineering Expertise Program choose to continue their studies or become entrepreneurs. It is expected that the partnership model based on new industry can be developed as a reference for government policy in developing VHS that can produce ready-to-work graduates by the needs of partner industries. The main purpose of vocational education is to make individuals obtain needed knowledge, ability, and practices for a certain job.

Moreover, [9] stated that the arrangement was "broad", many companies collaborated with the government to harmonize the general Vocational Educational and Training (VET) needs of a group of companies in the same industry as VET provided by local educational institutions. The partnership of many parties in training helps to form a collection of skilled labour from companies, large and small, can recruit and enable companies to avoid competition for labor at a wage. Broad partnerships can vary regarding how expensive investments are made by each company and school. This opinion considers that the vocational-and-BIW partnership model is very important to build the work readiness of students in implementing industrial work practices and internships in the industry. The partnership model has been reviewed by experts based on the model indicators and devices to meet the feasibility level of the model based on the theory that supports it. [10] stated that through vocational education channels, industry partnerships and personalized learning could be carried out to improve student learning outcomes. [11] the results of the study as part of this work show that a collaborative school management model between VHS and companies can improve the technical skills of VHS graduates. This model was developed through a process of planning, implementing and evaluating the results of the technical skills of VHS students. The implementation of the partnership management model between VHS and companies can improve the technical skills of VHS graduates. The linkages between educational institutions and industries vary from practical student training to the production and commercialization of new products [12].

This partnership requires support from the executive and the legislature, based on this opinion in the core strategies indicator the role of policy makers, especially the government, is very large in providing a legal basis for both parties, VHS and BIW [13]. Furthermore [14] in his research found that the Vocational Program is formulating the school’s vision and mission, compiling a joint curriculum, and cooperating with BIW; The mechanism of cooperation between VHS and BIW is illustrated by the agreement of both parties in the form of an MoU in the implementation of internship, other collaborations are guest speakers, implementation of competency tests, hearings and other seminars; and the factors that influence the collaboration between VHS and BIW in improving
graduate competency are seen from the involvement and commitment of school personnel in the preparation of school regulations and profiles.

[15] explained the role of industry in supporting the implementation of cooperation program achievements in schools is expected, because the equipment in schools has far lagged with the equipment in the industry, learning program some industrial equipment should be placed in schools as a means of training. Research result of [16] found that (1) explore the process of knowledge transfers between industries and schools in these partnerships. (2) theorises of how knowledge is valued and foundational in workplace employment can inform school curricula and pedagogical practices. (3) draw on theories of organizational knowledge, workplace learning and experiential learning to explore strategies that enhance school-to-employment transition outcomes. [17] the results of this study conclude as follows: (1) learning through partnerships that have been carried out in all vocational secondary schools is industrial practice and vocational practice exams. (2) learning constraints through partnerships, especially long distance and industrial schedules that do not always match the school. (3) model development can be done by improving the quality of learning with industrial practices in private companies and by adding learning models with industry visits, guest teaching, and the latest technology training. (4) the implementation of the model developed shows the feasibility and effectiveness of preparing students with the competencies needed by the workforce. (5) learning models through practicable partnerships are guest teaching, orientation to industrial practice, industry practice, student industry visits, latest technology training, and vocational practice exams.

5. Conclusion

Based on the analysis, it was found that: (1) The stages of the initial investigation of the description of BIW partnership activities in curriculum development, industrial practice, in-house training, on the job training for students and teachers; (2) Analysis of partnership issues (the program has not run optimally, the work unit is not yet appropriate, the contents of the MoU have not yet fully materialized, partnership activities are unclear, graduate competencies have not been absorbed, graduates have not yet been absorbed, there is no legal basis); (3) The VHS Partnership Model with BIW along with the instruments and instrument models are in valid and very valid criteria; (4) The design of the partnership model has 7 components including (a) government policies, (b) core strategies, (c) VHS policies, (d) industrial management, (e) service principles, (f) graduate competencies, and (g) the feasibility of graduates of VHS. Also, the results of the feasibility study of the partnership model are in the valid criteria, with an average of 3.8.

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References

[1] A. Stăncioiu, “The Fourth Industrial Revolution „Industry 4.0”,“ Fiabil. Şi Durabilitate, no. 1, pp. 74–78, 2017.
[2] J. Schlechtendahl, M. Keinert, F. Kretschmer, A. Lechler, and A. Verl, “Making existing production systems Industry 4.0-ready,” Prod. Eng., vol. 9, no. 1, pp. 143–148, 2015.
[3] M. Hermann, T. Pentek, and B. Otto, “Design principles for industrie 4.0 scenarios,” in 2016 49th Hawaii international conference on system sciences (HICSS), 2016, pp. 3928–3937.
[4] P. P. R. I. Nomor, “Tahun 2013 tentang Pelaksanaan Undang-Undang Nomor 20 Tahun 2008 tentang Usaha Mikro,” Kecil dan menengah, 17AD.
[5] S. A. Kuntoro, “Kemitraan Sekolah,” in Workshop Strategi Pengembangan Mutu Sekolah bagi
Kepala Sekolah dan Pengawas. Jurnal Nasional, 2010.

[6] T. Plomp, “Educational design research: An introduction,” Educ. Des. Res., pp. 11–50, 2013.

[7] A. Helmy, “VET Training and Industry Partnerships: a Study in East Java, Indonesia.” Victoria University, 2014.

[8] W. Sumbodo, Pardjono, Samsudi, and W. D. Rahadjo, “Implementation of partnership management model of SMK (Vocational High School) with existing industries in mechanical engineering expertise in Central Java,” in AIP Conference Proceedings, 2018, vol. 1941, no. 1, p. 20038.

[9] T. Remington, “Public-Private Partnerships in VET: Translating the German Model of Dual Education,” J. New Econ. Assoc., vol. 36, no. 4, pp. 182–189, 2017.

[10] E. P. Harrity, Vocational Pathways: Using industry partnerships and personalised learning to improve student outcomes. Fulbright New Zealand, 2013.

[11] F. Fakhri, H. Hadromi, and D. Widjanarko, “Practical Learning Model Assisted by Mobile Workshop for Enhancing Practical Skills and Entrepreneurial Spirit for Prospective Vocational High School Graduates,” J. Vocat. Career Educ., vol. 3, no. 2, 2018.

[12] R. Othman and A. F. Omar, “University and industry collaboration: towards a successful and sustainable partnership,” Procedia-Social Behav. Sci., vol. 31, pp. 575–579, 2012.

[13] M. Yahya and Y. Yasdin, “Patterns of Vocational Education Partnership in the Era of Decentralization,” in 3rd UPI International Conference on Technical and Vocational Education and Training, 2015.

[14] A. R. Murniati, N. Usman, and A. Azizah, “Vocational School-Industry Partnership in Improving Graduate Competency,” J. Ilm. Peuradeun, vol. 4, no. 3, pp. 269–280, 2016.

[15] D. Purwanto, “Manajemen kerjasama antara sekolah menengah kejuruan dengan industri,” Malang [http www. vede malang. com/.../488], vol. 2, 2013.

[16] J. J. Watters, S. Hay, N. Dempster, and H. Pillay, “School industry partnerships: An innovative strategy for vocational education,” in Proceedings of the ECER VETNET Conference 2013, 2013.

[17] S. Rochmadi, “Industry Partnerships Learning Models for Surveying and Mapping of Vocational High Schools,” J. Pendidik. Teknol. dan Kejuru., vol. 23, no. 2, pp. 210–225, 2016.