A model for a vocational school-corporate/industry partnership to improve students' technical skills

Hadromi

Universitas Negeri Semarang
Semarang, Central Java, Indonesia

ABSTRACT: The low technical skills of vocational school students result in low competitiveness of the graduates, and long waiting periods for them to be employed by industry. The co-management of vocational schools involving a corporate (company or group) and industry could improve the technical skills of graduates leading to an improvement in graduates' employability. The purpose of this study was to design and develop a collaborative model between vocational schools and corporate/industry in an effort to improve the students' technical skills. Results of a study as part of this work showed that a collaborative school management model between vocational school and corporate/industry could improve the technical skills of the graduates of vocational schools. This model was developed through the process of planning, implementing and evaluating the results of the technical skills of vocational school students. The implementation of the partnership management model between vocational schools and corporate/industry could improve the technical skills of the graduates of the vocational schools.

INTRODUCTION

Statistical data from the Central Bureau of Statistics, Indonesia, released in February 2016 reveal that the unemployment rate in Indonesia for vocational school graduates was a high 9.05%, followed by senior high school graduates with 8.17%. The head of the Central Bureau of Statistics, Dr Suryamin, argued that the cause of rising unemployment was a slowdown in Indonesia, and the low technical skills of vocational students [1].

The low technical skills do not occur only in Indonesia. The problems of most formal technical and vocational education and training (TVET) institutions in Nigeria are as follows:

1) low learning quality;
2) a mismatch between training and the demand of the labour market [2];
3) inadequate quality of TVET facilities, such as workshops, books, learning environment, machines, computer rooms, instructors and curriculum content [3];
4) inadequate practical workshops [4].

The effects of such problems are low technical skills and a low competitiveness of vocational high school students. The collaboration between vocational high schools and corporate/industry is important, not only to improve technical skills, but also to assist the government in financing vocational schools. A corollary is that the collaboration between vocational schools and corporate/industry must be properly designed [5].

A high level of technical skills can be added value for vocational school students entering the industrial world [6]. Technical skills can be defined as skills in handling or solving problems and the procedures, methods and techniques in the operation of technical equipment [7]. Technical skills consist of function, mode of operation, operational technique, maintenance technique, storage technique, calibration technique, and repairing possible damage using appropriate competency skills. Technical skills are the necessary competency in performing different types of work in corporate/ industry.

Various efforts have been undertaken to improve the technical skills of vocational school students, such as developing partnerships between vocational schools and corporate/industry. A partnership between a vocational school and corporate/industry can improve school performance and the technical skills of the students [1][8][9]. Relationship building can be interpreted as fostering and maintaining a mutual relationship or network between the vocational school and corporate/industry [10]. To realise a partnership between a vocational school and corporate/industry, a management model is required to support the objectives of a mutual partnership.

The aim of this study was to develop a management model for a vocational school and corporate/industry partnership as a way to improve the technical skills of vocational school students. The measures of the improvement of the technical skills of vocational school students were as follows:

1) employment waiting period of less than 2 years;
2) gaining employment according to his/her skills;
3) developing the skill competency required by the work unit.

The development of the partnership management model between vocational schools and corporate/industry required utilising and empowering all the resources and potential of the school. A vocational school and corporate/industry can establish a mutually beneficial partnership to solve mutual problems, which includes improving the technical skills of students to meet the demands of corporate/industry [11][12].

RESEARCH METHOD

The aim of this study was to develop a partnership management model for vocational school and corporate/industry in an effort to improve the technical skills of vocational school students.

The components of the management model include the management functions of planning, implementation and evaluation. The technical skills of students include the understanding of appropriate equipment based on its functionality; explaining the operation of equipment; operation of the equipment; equipment maintenance; equipment storage; equipment calibration; and the repair of damaged equipment.

The location of the study was Semarang city in Indonesia. The subjects of the study were 16 vocational schools of automotive technology and engineering. The object of study was to develop a partnership management model for vocational schools and corporate/industry to improve the technical skills of the vocational school students.

The first step was a descriptive/analytical preliminary study consisting of a literature review, field data collected using a questionnaire, interviews and a review of documentation. This preliminary study aimed to identify, describe and analyse the field data to provide the basis of the design of the partnership management model. The result of the preliminary study was an analysis and description of the partnership management model for vocational schools and corporate/industry to improve the technical skills of the students. Based on these findings, the model was formulated.

The steps in the development and validation of the model were as follows:

1. Developing the design of the vocational schools - corporate/industry partnership management model designed to improve the technical skills of vocational school students to meet the needs of corporate/industry; hereinafter, this will be called the model development design.

2. Conducting the first validation of the model development design through focus group discussion (FGD).

3. Improving the model based on the FGD results. The revised model was called the hypothetical model.

4. Conducting a second validation or model feasibility validation by testing the hypothetical model in three vocational schools.

5. Model feasibility validation was expanded to 13 vocational schools. Improvements were made according to the results of these validation tests. This step enabled the feasibility and implementation of the model to be verified. This was called the final model.

6. Testing the effectiveness of the final model on the user.

RESEARCH RESULTS

The results of this study consisted of the final model, the feasibility of the model data and model effectiveness data.

Model for Vocational School - Corporate/industry Partnership Management

The model for partnership management of vocational school - corporate/industry to improve the technical skills of the vocational school students can be seen in Figure 1. The implementation of the vocational school - corporate/industry partnership management model improved the technical skills of vocational school students. The achievement of the aim required the management functions of planning, implementation and evaluation. The management functions were undertaken in partnership with corporate/industry. The partnership with corporate/industry was important, because corporate/industry could employ the vocational graduates and resolve problems that may arise when corporate/industry recruit prospective labour from the graduates of vocational schools.

Feasibility Test of the Model

The feasibility test of the model was carried out by an initial limited trial conducted at three vocational schools; this was then expanded to 13 vocational schools. The objective at this stage was to evaluate the model's feasibility and the results of the implementation of the model. The data of the expanded trial at 13 vocational schools are shown in Table 1.

As can be seen from the data in Table 1, the average score of the feasibility model was 3.60, which equates to *very feasible* for the model to be implemented in vocational schools.

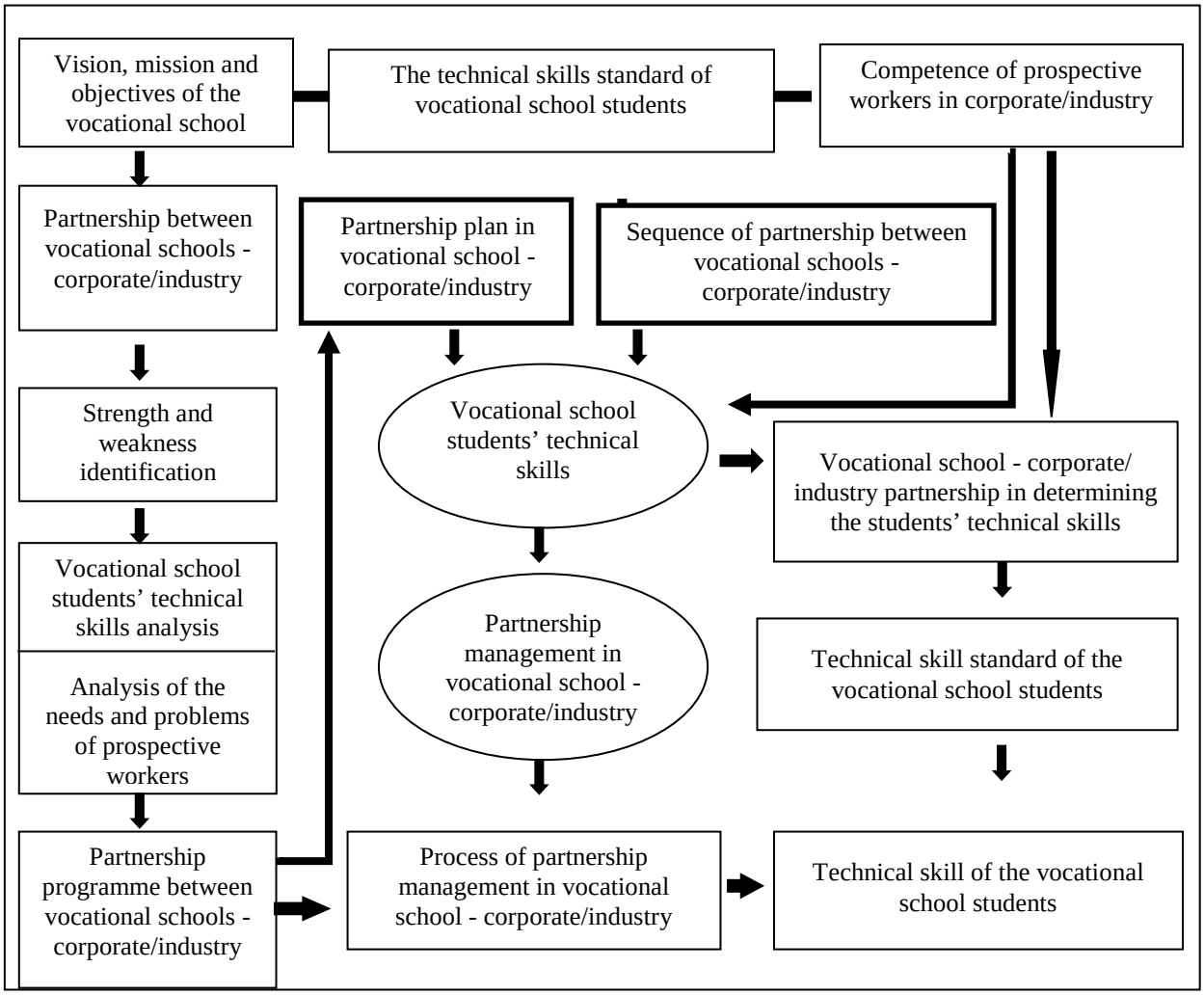

Figure 1: The model for partnership management between vocational school - corporate/industry to improve *technical skills* of vocational school students.

Table 1: Validation results for the final model.

No.	Components of the vocational school - corporate/industry partnership management model	Score average	Category
1.	The model facilitates lesson planning involving corporate/industry	3.67	Very feasible
2.	The model supports the learning process involving corporate/industry	3.67	Very feasible
3.	The model supports the evaluation of the learning process involving corporate/industry	3.67	Very feasible
4.	The model supports the partnership of the vocational school - corporate/ industry	3.67	Very feasible
5.	Vocational school - corporate/industry partnership management can be evaluated at any time according to the needs of the corporate/industry	3.67	Very feasible
6.	The model supports achieving technical skills of vocational school students to meet the needs of corporate/industry	3.47	Feasible

7.	Vocational school - corporate/industry partnership management improves performance of the vocational school	3.47	Feasible
8.	The model supports the evaluation of the technical skills of vocational school students	3.53	Very feasible
9.	Results of the evaluation of the vocational school - corporate/industry partnership management allows the potential follow up	3.60	Very feasible
10.	Average score for the final model validation	3.60	Very feasible

Effectiveness Test of the Model

After the final model was produced, an effectiveness test was conducted. The results of the model effectiveness test are shown in Table 2.

Table 2: The technical skills of students before and after implementation of the model.

No.	Technical skills of students	Technical skills of the students before and after implementation of the model		
		Before	After	Improvement (%)
1.	Explanation of the function of the equipment	0.75	0.83	10.00
2.	Implementation of equipment operation	0.67	0.82	18.37
3.	The technique of the equipment operation	0.72	0.87	17.31
4.	Equipment maintenance skills	0.70	0.83	16.00
5.	Device storage skills	0.80	0.82	2.04
6.	Equipment calibration techniques	0.73	0.83	12.00
7.	Equipment repair techniques	0.75	0.78	4.26
	Average technical skills score	0.73	0.82	10.97

As can be seen from Table 2, the final model implementation was effective. The average score for the technical skills of vocational students before and after the implementation of the model was 0.73% and 0.82%, which is an increase in the mastery of the technical skills of vocational students after the model implementation of 10.97%.

DISCUSSION

The implementation of the vocational school - corporate/partnership model (Figure 1) improved the technical skills of vocational school students (Table 2). The model was developed through the stages of planning, implementation and evaluation [13].

As shown in Figure 2, the planning function began by identifying the strengths and weaknesses of the vocational school students' technical skills. The needs analysis for prospective workers was conducted to identify the additional technical skills required of vocational school students. The implementation function involved implementing the learning as required by corporate/industry. The learning outcomes were evaluated during the learning process to ensure students reached the mutually agreed standard for technical skills.

The partnership model between vocational schools and corporate/industry is expected to meet the challenge of providing students with the required technical skills. This need may evolve and affect the dynamics of the partnership. The partnership model is able to accommodate the dynamic changes of the vocational schools. The internal and external pressures on vocational schools contribute to the dynamics of the partnership between vocational schools and corporate/industry [14-18].

The implementation of the partnership between vocational schools and corporate/industry should improve the technical skills of vocational students. Evaluation was carried out to measure improvement and detect mismatches in skills development in an effort to achieve the objectives of the vocational schools. Continuous improvement was carried out on the planning, implementation and evaluation of the students' technical skills.

The improvement in technical skills was not immediate and students were required to develop their potential. This involves a balance between the knowledge learned in the vocational school and the experience of the environment of corporate/industry. An industry-qualified technical skill strengthens the competitiveness of graduates and minimises the gaps in the needs for labour [1].

The partnership between vocational schools and corporate/industry is important, but:

1) the duration of training in industry was not always sufficient;

2) students' work in industry was sometimes different from what they experienced at school;

3) conflict often arose between what was taught in the school and what was actually done in the workplace;

4) students often did not receive training during the industrial work [19].

The partnership between vocational schools and corporate/industry aims to:

1) improve and develop the partnership between vocational schools and corporate / industry to improve the quality of vocational education;

2) take concrete steps to implement the form and type of partnership to mutual benefit;

3) establish a joint commitment as a basis for the partnership;

4) develop the partnership to jointly implement education [13].

The realisation of the partnership between vocational schools and corporate/industry required an appropriate partnership model. This model is an effort to address various vocational education issues ranging across curriculum design, facilities, funding, industry commitment to vocational schools, material resources, and monitoring and evaluation [20].

CONCLUSIONS

The partnership management between vocational schools and corporate/industry can improve the technical skills of vocational students. The model for partnership management was developed using the management functions of planning, implementation and evaluation. The target for the model was an increase in students' technical skills in the following aspects: implementation of equipment based on its functionality; explaining the operation of equipment, using the equipment; equipment maintenance; equipment storage; calibration; and repair.

The partnership management model for vocational schools and corporate/industry was rated as *very feasible* on being implemented in the vocational schools, based on a questionnaire study. The effectiveness of the implementation of the model was demonstrated by the increase in technical skill scores of vocational school students from before to after the implementation of the model. This increase was from 0.73% to 0.82%, or an increase in the mastery of technical skills of about 11%.

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