



Designing Industrial Internship Model to Improve the Skills of Prospective Vocational Teachers

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Abstract: Prospective vocational teachers must have technical expertise in their fields. However, efforts to achieve the competencies of prospective vocational teachers have always lagged behind industries. This is due to the difficulty of teacher training institutions in providing facilities that meets industry standards. Partnership with industry in teacher training is thus, a solution to improve the competency of prospective vocational teachers, both in knowledge, skills and corporate culture. The current industrial attachment practice lacks a mutually beneficial model partnership model. The purpose of this study is to develop a new institution-industry partnership model. The three stage model development methodology was used to guide the model development process. Model development stage was based on findings from field study and literature review. The model validation stage was conducted via focus group discussion with industry players and institutions, and the model implementation stage was conducted with nine automotive authorized dealers in Yogyakarta. At the end, learning four-element internship model was established which includes organizing internship programme, conducting internship, mentoring, and monitoring-evaluation elements. Evaluation of the model indicates that implementation of the model promoting vocational teachers competences via mutually beneficial partnership programme.

Keywords: institution-industry partnership, internship learning model, prospective vocational teachers

1. Introduction

Two recently issued policy statements to improve the quality of human resources have had a major impact on vocational education in Indonesia namely, the government policy on increasing the number of Vocational High Schools (SMK) and the Presidential Instruction No. 9 of 2016 concerning Vocational Revitalization (<http://setkab.go.id>, 2016). The realization of this policy would not be possible without serious considerations towards teacher preparations as teachers are the most critical factor in education policy success. In short, vocational education will only succeed if competent vocational teachers are there to support it (Mulyasa, 2008; Houle, 1980).

Vocational teachers however, are facing greater challenges compared to non-vocational teachers (Grollmann, 2008, Sirk at al, 2016). In addition to theoretical knowledge and skills which all teachers must have, vocational teachers must have adequate occupational competencies to function as effective vocational teachers. Theoretical capabilities (in general) can be obtained from campuses, training centers or other sources. Practical skills can also be obtained directly

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on campuses that are equipped with appropriate facilities and/or from works (industries). Vocational teachers must also have the latest industry insights, thus they can teach and train vocational students according to real work in industries (Mohamad et al., 2009). The working facilities in institutions are, unfortunately; rarely meet the standards/requirement of industries. Therefore, work experience in industries is a must for prospective vocational teachers to develop their occupational or vocational competence (Marasigan, 2018).

In Indonesia, the Teacher Training Institution (LPTK) has been mandated to produce prospective teachers. LPTK has been successful in ensuring the quality of its graduates for general education. However, LPTK has limitations in providing practical facilities that are equivalent to industry needs (including automotive engineering) as industries are developing very fast for institutions to catch up with. This situation demands that LPTK be creative in designing their programme to ensure that their graduates have the necessary occupational/vocational competencies and the existence of LPTK remains relevant. The changing times also naturally require that LPTK invest in innovative practices in preparing prospective vocational teachers (teacher preparation programme) for the more challenging roles in the emerging Industry Revolution 4.0 (IR 4.0). To create competent teacher candidates, it is necessary to improve the quality of LPTK, including pre-service training, internships in schools, internships in industries and other activities. The teacher must also be equipped with scientific skills adapted to the development of IR 4.0 industries (Wagiran, 2019).

Professional skills of prospective teachers can be realized if they do have experience in the real work environment. Prospective teachers must be equipped with discipline and experience in the real business world (Achdiani, 2012). LPTK must thus, carry out efforts of renewing, creating breakthrough, quality standardizing, networking, collaborating and coordinating with other institutions/agencies to improve the quality of prospective teachers. Thus the prospective vocational teachers must be exposed to work practices in industries directly, not just simulations or demonstrations on campus. Partnership with industries is a necessity to deal with facilities that are not in accordance with the development of the industry.

2. Essential competence for vocational teachers

In addition to technological competence, vocational teachers also need to have insights into the work culture in the industry, for example, discipline, work ethic, cooperation, communication, clean culture, work safety, and others (Goh & Zukas, 2016). The pedagogical responsibility for what happens to students at work remains with vocational teachers (Isopahkala & Bouret, 2010). Training and appreciation of the corporate culture in the industry are expected to be integrated with classroom learning. Good work culture in schools will become a habit for students so that they have sufficient provision when entering the workforce. Cooperation with industries in the form of apprenticeship/training is expected to reduce the cost of learning, especially practices in higher education, but cooperation with mutual benefits to both parties only should be considered.

The traditional practice of vocational education programme is designed using competency-based approach (Sofyan, 2015). This learning emphasizes the development of competencies among students, which includes aspects of occupational-related attitudes, knowledge, skills, and values. This competency can be achieved when it pays attention to the rules of practical learning, and it involves practical workshops. Grosch (2017) examines the developing of competency standards for vocational teachers in ASEAN, providing recommendations that vocational teacher education should focus on competency-based education, graduates, a balance between vocational, professional competencies and teaching and pedagogical competencies, relationships with industries (cooperative/dual system), high-quality pre-service education that will lead to the international level, especially in the ASEAN. Therefore, cooperation in improving skills at industries and teaching experience in Vocational High Schools is compulsory.

Developing appropriate occupational competence among teachers is crucial as states that "teacher comprehension and belief dictate what they teach to the students (Billet, 2011). When teachers do not participate in the industries working environment, they would not be competent in delivering materials suitable for the development of the business sectors and industrial sectors. So, for prospective vocational teachers, an internship in the industry has many benefits, including sharpening skills, experiencing the real activities and the real work culture in the industry, so they have confidence when teaching students.

2.1 Needs for Institution-Industry Partnerships in Enhancing the Competence of Vocational Teachers

Partnership activities with industries have become an urgent need for prospective teachers. The form of a partnership that meets the demands of professionals is the "internship learning model." According to Horne (2013: 81), internships are "activities in which students engage in learning through practical worksite experience. Internships are usually conducted by students who are at an academic preparatory programme". In agreement to the supportive role internship promoting occupational competency among teachers, Sweitzer and King (2014: 6), further state that internship offers an opportunity to develop qualities such as flexibility, sensitivity, and openness to diversity that are critical to your success as a professional, a family member, and a citizen.

A partnership with industries is needed to improve the competence of technical subject matter, soft skills, and corporate culture (work culture). By having good industry insight and updates, the prospective vocational teachers can teach relevant science and increase high self-confidence to become a teacher (Stephens, 2011).

2.2 Internship Learning Model: Definition, Functions and Characteristics

The internship learning model is a structured work experience programme, which contains practical applications of academic theories combined with real work experience. The implementation of this programme requires the involvements of several institutions, the existence of cooperation agreements, sharing facilities, and discussions in realizing mutual benefits. Sweitzer & King (2014) stated that to make internship activities successful, it is necessary to understand the components related to the internship programme, namely essential attitude and values, reflection skills, communication skills, personal resources, essential knowledge, and empowerment. Essential attitude and value, in an internship activity, include values of openness, flexibility, mutual understanding and openness for diversity. The existence of discrepancies must be understood and remain focused on the initial goal. Reflection skills is a comprehensive educational process that is felt by students from the surrounding environment. Students must have the ability to reflect on all phenomena and learning needs. Communication skills are followed up by providing appropriate feedback in the form of suggestions, analysis, problem-solving, guarantees and so on. Personal resources is a way for students to develop themselves well because it provides direct work experience, aspirations, knowledge, expectations, self-esteem and networking. The essential knowledge, this component will provide insight into things, including learning to understand other people to achieve organizational goals. Empowerment, the internship is expected to provide self-reinforcement, improvement of abilities, skills, attitudes, ethics and others (Sutijono, 2016). During the internship there will be active discussions, giving each other input and strengthening work, reducing frustration, and avoiding confrontation.

An internship programme aims to train or develop the practical skills of students under supervision, so this programme is useful for exploring various skills associated with work. Horne (2013: 81) conveyed several benefits of internship namely; observe the work and develop needed work skills, earn credit outside the classroom, experience work in chosen career fields, explore career options, learn work terminology, work climate, and business/ industry protocol, and skills in a chosen career field. Based on the above explanation, it appears that the internship will enable students to acquire expertise according to their needs and develop according to their careers. This programme is expected to be able to provide insight for prospective teachers to study the work climate (corporate culture), the applied rules, get a complete picture of the work field to be transferred later when they provide learning to vocational students.

A well-organized "internship" learning model will function to help interns in several ways; facilitate an understanding of the target profession and prospects of working conditions, provide valuable exposure on the job, developing professional skills and attitudes, and establishing contacts with people working in the same profession (Saleha, 2012). "Internship" activities will lead students to be aware of their work environment, obtain values during the programme, develop skills and attitudes and can understand the conditions of their colleagues. These skills also need to be owned by prospective teachers candidates regarding the climate of the workplace environment for vocational school graduates. According to Horne (2013), the stages that must be addressed in an "internship" learning programme are identification of the environment/workplace, placement of students, preparation of schedules, confirmation of planning, preparation of students, and preparation of workplace supervisors.

The partnership between LPTK and industries in preparing prospective teachers must have a common goal and bring benefits from both parties. Frank and Smith (2000: 5) stated that "a partnership is defined as a relationship where two or more parties, have compatible goals, form an agreement to do something together. Partnerships are about people working together in a mutually beneficial relationship, frequently doing things that won't be able to be achieved alone". Robertson, et al. (2012: 211) states that existing evidence from the world between the private provision of education and indicators of education quality is positive, which suggests that the private sector can deliver a high-quality education at a low cost. Therefore, the partnership between the educational field and industries must be believed to be able to get a positive impact on mutual benefits, so that it can improve the quality of education, but at the same time, the cost of education can be reduced.

The partnership is just one way to achieve the goals of an institution/organization. According to Frank & Smith (2000: 11), several factors are considered and need to be done regarding partnerships, among others: "... having common interest or concerns, understanding your partnership environment, understanding what a partnership involves, and being open to doing things differently". It can be concluded that partnerships emphasize several things including having shared concerns or desires, understanding the conditions of the partners' environment, understanding involvement in partnerships, and being open to different activities. Successful partnerships must refer to specific rules and not cause complexity. Partnerships are unique and are arranged with specific steps. According to Frank & Smith (2000), the partnership process includes initial development (planning), making it happen (implementation), and accountability and future direction (evaluation).

2.3 Current Institution-Industry Partnership Programme

The LPTK partnership with industries is currently carried out in the form of an Industrial Practice (PI) programme. Industrial Practice that held at the Department of Automotive Engineering, Faculty of Engineering UNY is still considered to have several weaknesses, including; there is no strong partnership because students are looking for the location of the internship themselves it was carried out too early (in the fourth semester when the students have not obtained the main courses in the automotive), and the implementation time is too short. In this study, improvements were made to the existing models.

The aim of his study is to design, develop and evaluate an internship learning model for prospective vocational teachers in the automotive industry. The specific objectives were: to determine the characteristics of the partnership model that is most appropriate for the preparation of prospective vocational teachers, to validate a proposed internship model characteristics through feedback from industry and institutions, and to evaluate the internship learning model for prospective vocational teachers through implementation in the automotive industry.

3. Model Development Methodology

This study adopted the design and development research methodology that is proposed by Richey and Klein (2007). The stages of this study consisted of developing the model, validating the model, and implementing the model. The model development phase was carried out through field studies, literature studies, and review of research findings. The model validation phase was carried out through eight experts' judgment (four vocational education lecturers and four industry practitioners). Data were gathered by depth-interview through focus group discussion (FGD), involving 12 participants of practitioners (industries), academicians (teacher training institutions), and vocational teachers.

The model implementation stage was realized through the implementation of the model at nine automotive industries in Yogyakarta, involving 44 prospective vocational teachers who were on the internship programme. For this stage, data were collected using two instruments namely, an assessment sheet for industry feedback and closed items questionnaire for prospective vocational teachers who have undergone an internship programme at the respective locations. The assessment sheet was given to the heads of the workshops while the questionnaire distributed to prospective teachers. Data analysis techniques include analysis of qualitative and quantitative data adjusted to the type of data at each stage.

4. Establishing the Internship Learning Model

4.1 Development Stage of Industrial Internship for Prospective Vocational Teacher

The development of the model was based on findings from field studies in addition to literature studies, and review of research findings. Field studies were conducted through observations and interviews with nine heads of the automotive workshop in Yogyakarta. The summary of the data obtained related to the students' practice are as follows: the ongoing industrial attachment practices has not been conducted seriously, the industry has not benefited from the implemented cooperation yet, the industry only gets free labor although it is also not maximal, the apprenticeship period is not adequate, the assessment has not reflected actual competence, and the university curriculum should be adjusted to meet the conditions in industries.

Based on the findings of this initial study, the nature of the industrial attachment is an apprenticeship. It means that students only work on assignments according to demand from industries. Prospective teachers cannot determine the materials for meeting their needs. Furthermore, apprenticeships are currently held at the end of the fourth semester, where students have not taken all of the necessary engineering courses, including vehicle diagnosis and automotive workshop management which are very important in automotive competency. The duration of the prospective teacher's student internship is only 1.5 - 2 months. In summary, cooperation already exists between LPTK and industries, but the substance does not reflect the ideal and mutually beneficial working principle of cooperation.

Partnerships should generate benefits for both parties, both for teacher training institutions and business sectors and industrial sectors. If the apprenticeship process is not ideal, then the goal of increasing the competency of prospective teachers, especially skills, is difficult to be achieved. Based on the results of the preliminary research and reviewing some literature, a plan for the internship model was developed in industries. Some of the considerations taken are; modifying the ongoing programme, increasing the duration of the internship, choosing a location of industry and a representative industrial mentor.

4.2 Validation Stage of Industrial Internship for Prospective Vocational Teacher

Validation of the draft model that consists of a schematic diagram of the model was conducted by experts based on its feasibility including content, language, and general assessment. The experts are four academicians and four practitioners. The results of the assessment of the draft model from the validators are shown in Table 1.

Table 1 - Results of Draft Model Validation

	Indicator	Expert Validator								Mean
		1	2	3	4	5	6	7	8	
Content Aspect										
1	The rationale for implementing the internship model is clearly stated	4	5	5	5	4	4	3	4	4.50
2	The objectives of implementing the internship model are clearly stated	4	4	4	5	4	4	4	5	4.42
3	The planned product specifications are clearly stated	4	4	5	5	4	4	3	5	4.33
4	The internship model material implemented in the industry is clearly stated	4	4	4	4	3	4	3	5	4.00
5	The flow of the internship's implementation activities is clearly stated	4	4	4	5	3	4	4	5	4.25
Language Aspect										
1	Using Indonesian in accordance with good and correct rules	5	5	5	5	4	4	3	5	4.42
2	The language used is easy to be understood	5	4	5	5	4	4	3	5	4.33
3	The vocabulary used is not ambiguous	5	4	5	4	4	4	3	5	4.25
General Assessment										
Feasibility to use the Guidebook		US UR UR UR UR US US UR								
Explanation: US (can be used), UR (can be used with revision), UN (cannot be used)										

As seen in Table 1, validators state that draft models can be used with revisions (improvements). After that, the draft model was being revised into an internship guide book, was subsequently requested for assessment in an FGD involving relevant experts, including four academicians, four automotive practitioners, and four automotive vocational teachers. The experts discussed the current partnership, planning, organizing, conducting, mentoring, and how to assess the internship programme. The conclusions from the FGD were: the implementation of a minimum of 3 months internship (from ideal 6 months), internship in the industry should be carried out in semester 6 because students have taken all engineering courses (especially diagnosis and management of the automotive industry), the need for formal and standard partnership between LPTK and industries institutions in the form of a memorandum of understanding (MoU), LPTK must be proactive in developing partnership programmes, government policies through Presidential Instruction No. 9/2016 (concerning Vocational Revitalization) and Ministry Labor Regulation No. 22/2009 (concerning apprenticeship) becomes the basis of a partnership between LPTK and industries, the need for mentors who have certain qualifications, and regular monitoring. The feedback was taken into considerations in the design of the implemented model. The design of a partnership-based apprenticeship model for the prospective vocational teacher between LPTK and industries is shown in Figure 1.

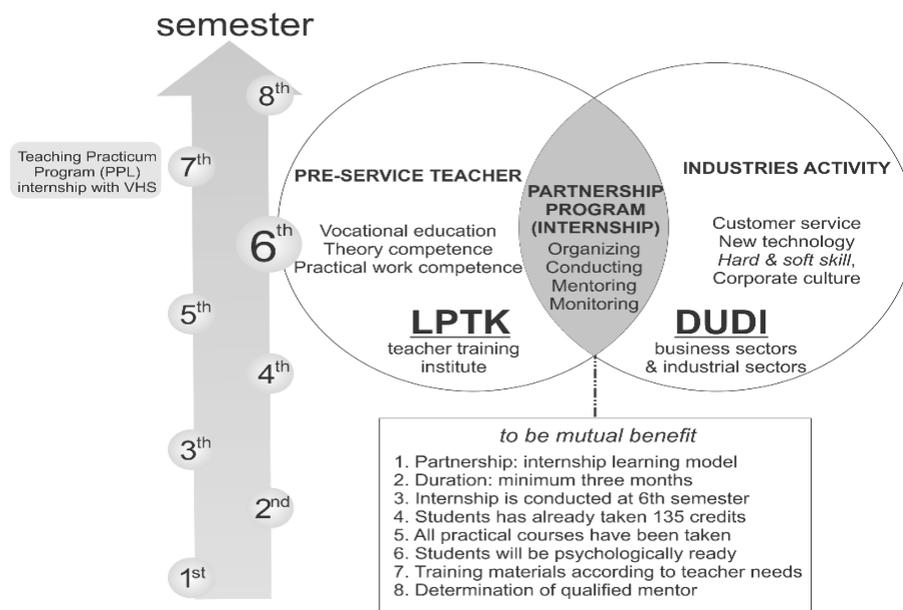


Fig. 1 - Design of an Internship Learning Model for Prospective Teachers

4.3 Implementation Stage of Industrial Internship for Prospective Vocational Teacher

In the implementation phase, the internship programme of the prospective automotive teacher is carried out in several stages, namely *organizing programmes, conducting internships, mentoring, and monitoring* (Fig. 1). The organization of the programme is started with collaboration between LPTK and industries. The partnership through the internship learning model is carried out by modifying the existing partnership programme, by MoU, understanding the objectives of the internship partnership model, agreeing on the respective rights and obligations, increasing the duration of the internship, optimizing instructors' guidance, and continuing reflection. The partnership agreement from the LPTK was carried out by the Dean and from the industry by the Workshop Head. Before the activity was carried out, socialization and coordination were conducted. Coordination with industries is carried out to disseminate information on the internship programme, time, materials, content, guidance and targets to be achieved by the programme and students. Coordination with industries is carried out by the Head of each APM Workshop/workshop. Implementation of partnership through internship learning model on preparing the prospective vocational teacher are through the following stages:

- a) Duration of the internship. Based on an agreement with the industry listed in the MoU, the implementation of an internship is three months.
- b) Identification the location of the internship. The researcher identifies the location of qualified workshops (APM or equivalent), submits the application, programme socialization, and commitment agreement. The industry is synchronized into specific skill groups to meet students' needs.
- c) Confirmation of planning. The researcher always strives to maintain relations with industries, before, during and after the implementation of the programme. A harmonious relationship is always sought so that the partnership can run well.
- d) Class activities. Strengthening the competence of engineering expertise for prospective teachers is conducted by asking the industry to provide special content according to the needs (internship) of prospective teachers. Students do technical work in the workshop, conduct discussions with mentors, make journal reports, and reflection.
- e) Preparation of students. Before the students enter the industries; discussion, material and location adjustments are carried out and also the schedule is prepared.
- f) Scheduling. Scheduling is conducted to direct the apprentice participants to achieve their competencies, as well as assist the coordinator at industries in directing the participants.
- g) Workplace Supervisor Preparation. The supervisor at industries is the responsibility of the Workshop Head and most of the supervision is carried out by the Workshop Head and the Chief of Mechanics.
- h) Placement of interns. Students are placed according to their teaching needs, namely: automotive fundamentals and engine section (Nissan Datsun Bantul, Nasmoco Janti Toyota, Hyundai Adisucipto Yogyakarta, and Gadjahmada Autocare UGM), electric section (Suzuki New Sources Jl. Solo and SBM Suzuki Mlati), chassis section (SBM Suzuki Bantul and Pratama Mobilindo-Hino Partners), and special materials Mitsubishi M-TEP (Borobudur Oto Mitsubishi Cars)

Mentoring is given to students while carrying out internships in the industry. Students learn general materials about the work field at the automotive industry and study special material following the prospective subjects to be taught as teachers. During the internship, prospective teacher students receive guidance from the workshop head or senior mechanics as a mentor. Students write job journals and are endorsed by a mentor on a weekly basis. These mentors also provided potential solutions on issues such as knowing the mentee's level of development and expectations, building a professional relationship before placement and the mentor's dual role as confidant and assessor (Hudson & Hudson, 2010). Monitoring is carried out by the supervisors and mentors from the industry. Monitoring is carried out to monitor the progress of participants while running the internship program. To determine the performance of prospective students in internships in industry, mentors conduct a regular performance assessment of students at the end of the month. The results of the consideration are used for further improvement.

At the end of the implementation stage of the internship model (interns completed their internship at the respective industries) industry respondents consisting of programme coordinators (the workshop head or assistant service managers) were asked to rate the suitability of the model that had been implemented. The summary of their ratings is presented in Table 2. Hundred percent of industry personnel rate the internship model from good to very good.

Table 2 - Assessment of The Internship Programme Model

Category	Respondent	Percentage
Very Good	7	63.64
Good	4	36.36
Fair	0	0.00
Poor	0	0.00
Total	11	100.00

Perceptions of interns (prospective teachers) were also sought on the achievement of internship learning model. Specifically respondents were asked on their perceptions towards the suitability of the teaching material in meeting the internship objectives, the adequacy of mentoring provided by their industry mentors and the contribution of the internship towards knowledge and skills acquisition of the prospective teachers. Number 100 shows that all prospective vocational teacher trainees in the industry achieve the maximum of these components. The summary of their responses are shown in the following table.

Table 3 - Achievement of The Partnership Through Internship Learning Model

No	Workshop	Perceptions of Prospective Teachers (%)		
		Suitability of Material	Mentors' Guidance	"Internship" Contribution
1	BOM (Mitsubishi)	100	100	100
2	Nissan Datsun Bantul	90	100	90
3	Mitra Persada (Hino)	88	100	100
4	SBM Suzuki Mlati	70	100	100
5	SBM Suzuki Bantul	67	67	100
6	Nasmoco (Toyota)	50	100	80
7	GAS (Gajahmada)	50	33	67
8	Hyundai	50	33	50
9	SBM Suzuki Solo	17	50	67
Mean		64,66	75,88	83,33

As seen from Table 2, all respondents stated good (36.36%) and very good (63.64%) towards the partnership through the internship learning model that had been implemented. From the achievement of mastery competency of prospective teachers, in general, it was conveyed that most competencies were achieved with some input. It is noted that it needs better preparation and debriefing and identification of competency requirements in the industry. For mentoring in industries, in general, it has run effectively.

Interns were also satisfied with the programme as seen from their response in Table 3. Nearly 65% of the internship programme students feel that the materials obtained were following their needs, and around 76% of them stated that the guidance received was adequate. However, less than 100% agreement indicates that there are still some difficulties in adjusting material needs and guidance with conditions or work in the field due to time constraints. This is very understandable because the purpose of industries is profit-oriented, providing services to consumers, pursuing company targets, and others. In general, most of the internship trainees feel that the internship programme made a good contribution to their future teaching competence. Internships provide teachers with hands-on experiences with new equipment and technologies used in the occupation (Stephens, 2011).

Interestingly, Borobudur Oto Mitsubishi scored 100% which could be due to several points, including (i) there is already a partnership between industry and SMK 2 Yogyakarta, related to the applied curriculum, where the curriculum is integrated with Mitsubishi M-Step, (ii) the existence of an MoU between LPTK, industry, and Vocational High Schools, especially in preparing prospective teachers, where students who will conduct teaching practicum at SMK 2 Yogyakarta, carry out internships at Mitsubishi, and (iii) Borobudur Oto Mobil has a training center and is accompanied by Mitsubishi certified instructors.

5. Conclusion

The study set out to determine a feasible internship model for prospective vocational teachers serving in the automotive industry. A model was constructed through a three-stage process namely, development stage, validation stage and implementation stage. In the first stage, a model was drafted based on knowledge gained from the literature search and field studies. The field study in particular highlighted weaknesses in the current industry attachment practices and institution-industry partnership model where institutions and industry were not equally benefitting from the partnership. These findings form the basis for the new institution-industry partnership model which leans towards an internship model instead of an apprenticeship model. The new institution-industry partnership model was based on an internship learning model that was developed through considerations of four interrelated elements namely, *programme organizing, programme implementation, mentoring, and monitoring*. Considerations of these four elements have enabled the implementation of a mutually beneficial partnership through the implementation of the internship learning model. The finding from this study on the internship learning model is of relevance (specifically related to material and mentoring) to TVET teacher training providers that are keen to enhance the occupational competence of their graduates through a mutually benefitting institution-industry partnership.

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