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Regionalization and Harmonization in TVET

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Villa Isola.

Villa Isola is one of Bandung's colonial heritage, which was designed by C. Wolff Schoemaker (1882–1949), commissioned by D.W. Berretty (1890–1934) in 1932. It is located in Universitas Pendidikan Indonesia Bumi Siliwangi campus and has served as its landmark. The building, designed using Nieuwe Bouwen style, was originally Berretty's residence but handed over to the university as the university was established as Teachers Education College in 1954.

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Regionalization and Harmonization in TVET – Abdullah et al. (Eds)
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Table of contents

Social and cultural issues

Teaching innovations in TVET

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Preface

The 4th UPI International Conference on Technical and Vocational Education and Training was held in Bandung (Indonesia) on 15–16 November 2016. The conference is a biannual event, which has been conducted by the Universitas Pendidikan Indonesia's TVET Research Center and the Faculty of Technology and Vocational Education. Like the three previous conferences, this conference received enthusiastic response from scholars and practitioners of TVET around the world. Participants from Malaysia, India, Timor Leste, and many cities in Indonesia attended this year's conference.

Exploring the theme "Regionalization and Harmonization in TVET," the conference featured Prof. Dr. Numyoot Songthanapitak, the president of the Regional Association for Vocational Teacher Education in Asia and the president of Rajamangala University of Technology Lanna, Thailand; Prof. Dr. HC. Thomas Schröder and Dr. Sven Schulte of the Technical University of Dortmund, Germany; Prof. Dr. Maizam Alias of the Universiti Tun Hussein Onn Malaysia; and Dr. Eng. Agus Setiawan of Universitas Pendidikan Indonesia as keynote speakers. Participants presented their papers, which are categorized under subthemes: Standardization in Regionalization and Harmonization, Skill and Personal Development, Social and Cultural Issues, Teaching Innovations in TVET, and Innovations in Engineering and Education.

There were approximately 200 submissions from various countries to the conference. The committee selected 70 papers to be presented in this year's conference. These papers were then selected to be published in TVET@Asia online, and a conference book, published by Taylor & Francis and submitted for indexation in Scopus and Thomson Reuters.

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Standardization in regionalization and harmonization

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Integrated competency-based assessment and certification in vocational high school in Indonesia

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ABSTRACT: The objective of this research is to find a model of Integrated Competency-Based Assessment (ICBA) and certification that is appropriate for implementation in Vocational High School (VHS). The model is a test of competence that is combined with a learning and assessment process. This study used research and development established by Gall et al. The results of this research found that the model of ICBA and certification was feasible for implementation in VHS. The model was created through the aspects of developing competency standards and competency-based training development in work practices. The competency standard was developed through setting standards of competence and suitability needed for the job. The development of vocational learning is achieved through the professionalism of the teacher, the development of learning resources and learning models, evaluation models, and the reporting of learning outcomes in the form of a skills passport. Developing a competency-based assessment was done in the context of the examination system by working on real jobs.

1 INTRODUCTION

Vocational High School (VHS) has the purpose of preparing students for work and/or continuing their studies. The vocational education system should be able to prepare graduates to have competence in accordance with industry standards, both nationally and internationally. VHSs in Indonesia have implemented the concept of a dual system of education. Education and training can be done in schools and in industry, based on program link and match. Students learn the basic theory and practice in vocational school, then study and work at the company as an apprentice. This dual system is based on the view that vocational education will be efficient if the environment in which students are trained is a replica of the environment where they will be working (Prosser & Allen, 1925).

This study sought to establish competency test models that combine the learning process in schools and learning in industry (industrial working practices) with the assessment process. The curriculum was developed according to the needs of industry and standards in the workplace. Learning at school or in the workplace was adapted to the results of curriculum development conducted by the school and industry. The integrated competency test model is a model that combines aspects of the competency test curriculum development, learning at school, and learning in industry through industry working practices with the assessment process/competency test in order to establish the knowledge and skills of students according to the test of competency standards that apply in the workplace.

1.1 *Curriculum development*

While Finch and Crunkilton (1999, p. 11) state that the curriculum is defined as the number of learning activities and experiences which students are expected to have; it is like the direction of the school. Scott and Sarkees-Wircenski (2004, p. 396) state that the principle of a vocational education curriculum is derived from the needs of the world of work. Given the three definitions above, it can be concluded that the curriculum is the teaching and learning process that aims to improve the knowledge, skills, and experience of students in formal educational institutions, where the curriculum comes from the needs of the working world.

Cumming and Wyatt-Smith (2009, p. 1) state that assessment (and its interface with curriculum, teaching, and learning) has always been a significant component of classroom practice. Their opinion suggests a scoring system linking the curriculum with teaching and learning. Further, that in implementing the curriculum development, the system of learning, teaching and assessment should be considered.

1.2 *Competency-Based Training (CBT)*

According to Palomba and Banta (1993, p. 30), competence is a knowledge, skill, ability, quality of

personal experience, or other characteristic that is applicable to learning and success in school or in work.

According to Gonczi (1998, p. 222):

> *To reform vocational education and training within a framework of national competency standards cannot succeed without a change in thinking about assessment methods and the conceptualization of competence requires a holistic approach, which integrates knowledge and skills with realistic workplace practices.*

This statement implies that the method of assessment should be modified according to the standards of competence that have been determined. In concept, competence requires an integral approach between knowledge and the skills to practice in a real workplace.

1.3 *Competency-Based Assessment (CBA)*

Gonczi (1998, p. 38) states that CBT is characterized by the relationship between education/training and a Competency-Based Assessment (CBA) system. Competence standards are a major benchmark in the implementation of assessment/competency-based testing. On the other hand, CBA can be done while the trainees/students work in the workplace. Someone who is doing industry practice (on-the-job training) may be tested when they have been able to do the job.

Assessment is a process that involves the collection of evidence that is the basis for determining the progress or achievement of a student or trainee in relation to appropriate learning objectives (Hawke & Oliver, 1998, p. 244). As Miller (2008, p. 2) states, assessment is a broader term than test and the general process that includes gathering, synthesizing and interpreting data involves informal and formal data. Furthermore, Finch and Crunkilton (1999, p. 271) stated that the assessment is the determination of the benefit or value derived from the curriculum (or a part of the curriculum). Assessment is the process of gathering, synthesizing and interpreting data about the learning process as the implementation of the curriculum.

1.4 *On-the-Job Training (OJT)*

Van der Klink and Streumer (2006, p. 369) state that On-the-Job Training (OJT) is intended to: (a) increase the flexibility of learning programs in the workplace, (b) facilitate transfer of class-based learning, because the workplace and place of learning is identical, and (c) change the nature of work to provide more possibilities for integration between learning and work. Van der Klink and Streumer are of the opinion that on-the-job training can be described as a workplace learning program whose aim is to get learning in the classroom and in the workplace closer together so that the existing competence in the world of work can be acquired by the learners.

The importance of OJT to vocational education is that it can add work experience. Thompson (1973, p. 240) states that OJT is very important for high-school students who want to know how it feels to work in certain jobs. This means that OJT can improve skills when students work. So, to get the skills to apply in the workplace, students must perform on-the-job training in industry.

2 RESEARCH METHODS

2.1 *Model development*

This study aims to develop a test model of competence in VHS and is intended to generate a product in the form of a test model of CBA. Thus, in this study there is a product development activity, and therefore this research includes a form of Research and Development (R&D). In this case, the researchers chose an R&D research model developed by Gall et al. (2007, pp. 589–594), modified by Sukmadinata (2011, pp. 184–190).

The steps of this R&D can be described as follows. The first step is a preliminary study that provides: (a) a study of the literature on the aspects studied, whether derived from the theory, research, or field studies related to competency testing, and (b) the drafting of a competency test product based on the literature and expert judgment and conducted through Focus Group Discussion (FGD) with experts/academics and practitioners in educational institutions and industry/associations. The second step is the development of products, which consists of (a) a limited product trial conducted in two VHSs, and (b) expanded product trials conducted in four VHSs. The third step consists of end-product testing and the dissemination of the associated results.

3 RESULTS AND DISCUSSION

3.1 *Result*

This study was conducted in two stages: the first stage is done by taking a vocational course selected with a qualitative approach; the second stage was testing of the model developed on the basis of the research results.

3.1.1 *Practice teaching and learning activities in VHS*

Some of the findings of practices at the VHS were: (a) the teacher is not required to have a certificate of competency or to become an independent assessor; (b) students learn in working groups of four

students, each group having a different job; (c) students wrote a report on the practice and at the end of the meeting there was an evaluation; (d) not all of the materials tested practices; (e) students who failed remedial tests; (f) the result of the practices of the students takes the form of report cards.

3.1.2 *Industrial Work Practice (IWP) in the workshop*

Observations of the times that the students carry out learning in the workplace in the form of working industrial practices revealed that: (a) students are required to follow a program in the practice of industrial work; (b) students are given the freedom to select a location as desired; (c) students work according to the type of work in the workshop with the guidance of a mechanic who was appointed during the performance of the IWP; (d) the students record all of the types of work that have been done in a daily journal; (e) IWP does not provide practice exams for students; (f) students who have qualified will get an IWP certificate signed jointly by the school principal and the leadership of the industry/workshops.

3.1.3 *Vocational Practice Exam (VPE)*

External assessors of the industry make no judgment directly on the competencies being tested, due to the limited number of industry assessors. The number of external assessors in Yogyakarta VHS for the implementation of this Vocational Practice Exam (VPE) numbers just two people who cannot be fully present for the VPE. Administratively, the student assessment sheet is signed by two assessors, namely external assessors from industry and internal assessors/teachers, but technically the assessment is carried out by the internal assessor/teacher, then external assessors sign the assessment sheet that has been filled in by the internal assessors. At just two people, the number of external assessors is not sufficient compared to the number of VPE tests undertaken.

3.2 *Discussion*

The opinions of experts regarding these CBA models are analyzed in the discussion, based on the study of the theory and the data obtained. This part mainly consists of two parts. First, it discusses experts' opinions, including existing theories and research results on CBA models. Second, it discusses the final product of CBA models of this study.

3.2.1 *Competency standards development*

Standard Kompetensi Kerja Nasional Indonesia (SKKNI) is used as a guide in developing competency standards in vocational training because the purpose of vocational education is to prepare students for work. Norton (2008, pp. 17–18) suggests that in a standard task analysis of needs, work begins and ends with the development of competency profiles. Norton's opinion suggests that, in the development of competency standards, there is a need to analyze the needs of the work, which is none other than already stated in SKKNI, and developed into a competence standard.

Another opinion, expressed by Kelly (2000, pp. 14–15), states that in formulating basic standards in vocational education, concepts and basic operations and aspects of humanity, ethics and society need to be developed. Statements by Norton and Moser (2008) and Kelly (2000) confirmed that there needs to be a blend between the curriculum and SKKNI in developing competency standards in VHS.

3.2.2 *Curriculum development*

Putting a team of experts who are claimed to be experts on curriculum development and subjects in the curriculum is necessary for curriculum development, in addition to considering business and industry elements. Thus, this team ideally consists of: (a) administrators – academics in the field of vocational education; (b) instructional staff – an instructor in engineering fields; (c) support personnel – the developer of the curriculum/program; (d) advisory personnel – a committee of experts/professional associations. The opinion of Norton and Moser (2008) suggests that the members who should be involved so that the curriculum can be developed effectively and efficiently include engineering education experts, curriculum developers, and practitioners.

Rauner (2009, p. 1582) states that in the development of a vocational education curriculum, the occupational form of work is the main point of reference for the development of curricula. Rauner's opinion suggests that in developing the vocational education curriculum, forms of work related to the position/task become a reference in the development of the curriculum. Another opinion that supports consideration of the needs of students and social conditions was expressed by Prosser in Scott and Sarkees-Wircenski (2004, p. 390–391), which states that vocational education as an educational institution must expand opportunities for students to study or work as needed.

3.2.3 *Competency-based training development*

Input from a team of experts who claim that the module as a source of learning needs to be enriched with other learning resources to give students flexibility, in accordance with the opinion of Norton and Moser (2008, pp. D1–D2), states that learning should be able to provide a program for individual development, and the learning process can take place in the workplace. The learning model needs to be developed in the direction of cooperative learning and in accordance with the demands of the curriculum, in line with the expert opinion of

Dewey in Clark and Winch (2007, pp. 126–127), who states that vocational education has characteristics that include, firstly, a curriculum that demonstrates relevance to the vocational needs and, secondly, the knowledge needed to provide a better approach to the learning process.

3.2.4 *Development of Industrial Work Practice (IWP)*

The expert judgment which states that there needs to be standardization of competence in the IWP program, along with the imposition of performance criteria in the workshop where students practice industrial work, was supported by the opinion of van der Klink and Streumer (2006, p. 375), who suggest that learning in the workplace be based on training design details, such as contained in instructional design theory. The purpose of training is determined according to analysis tasks in the workplace, and learning materials should be developed in accordance with the conditions in the workplace. The standardization of competences, along with their performance criteria, should contribute to the skills passport of vocational students following an IWP program.

3.2.5 *Development of an Integrated Competency-Based Assessment (ICBA)*

According to expert judgment, the development of an ICBA and the use of a first-party professional certification agency (*Lembaga Sertifikasi Profesi Pihak-1* (LSPP-1)) at a VHS should be supported by strong policies and regulations. The ICBA should be carried out by a professional certification institution recognized by the certification body of the relevant profession in order to obtain the recognition of an independent agency. Under the guidelines of the National Professional Certification Board (*Badan Nasional Sertifikasi Profesi* (BNSP)), education and training institutions can seek the presence of LSPP-1. Students are tested by LSPP-1, which has received accreditation from BNSP. ICBAs, in the form of collecting evidence of competence, were conducted by LSPP-1. Students who have demonstrated evidence of competence have been declared competent and certified by LSPP-1. Students who have not been certified competent to work practice in industry, and together with students who want to gain competency, are tested by LSPP-1 using patterns established through work/simulation. Students who have satisfied all competency packages will receive a technician certificate and those who have got the certificate of compliance that they meet a competency have mastered the skill contained in the passport.

3.2.6 *Final development of ICBA model*

Verification is done by LSPP-1 on the results of the ICBAs completed by students during IWP. If the results are in accordance with the standards of competency that have been listed in the skills passport, then LSPP-1 issues a certificate of competence. If the results are not in accordance with the criteria, then the student does not receive a certificate of competence. Students who have not been declared competent by the industry when implementing industrial working practices, are given the opportunity to follow up with a competency test in a work simulation conducted by LSPP-1 at an assessment center in the VHS. The material in the ICBA covers competency clusters that have been listed in the skills passport in accordance with the student's choice. The revised ICBA end models from the final product assessment by the experts can be seen in Figures 1 and 2 (see Appendix).

4 CONCLUSION

Based on the results of data analysis and discussion, the results of this study can be summarized as follows.

1. The model for a competency test was conducted at VHSs in the form of the VPE, which is an integral part of the examination conducted in the context of the National Education Standards.
2. Barriers to ICBA implementation in VHSs are: (a) vocational training has yet to have independent professional certification agencies; (b) the VPE that has been used to date is based on a simulation of real work patterns; (c) the certificates of competency issued by VHSs have not received recognition from an independent professional certification agency.
3. The ICBA model we have developed for VHSs includes: (a) competency standards developed according to a blend of SKKNI for the automotive industry with Standar Kompetensi Lulusan (SKL); (b) synchronization with the syllabus requirements of existing jobs in industry, reviewed regularly every year; (c) components of vocational learning such as teachers becoming independent assessors, students gaining material soft skills through the inculcation of a Kaizen culture, progress reports in the form of skills passports, and VHSs having TUK, and becoming independent professional certification agencies; (d) students carrying out IWP with a focus on clusters of competence, with competency tests conducted on the basis of a real job in the industry.
4. The ICBA model that is feasible in VHSs is a competency test that combines the learning process with a process of assessment/examination conducted when students carry out industrial work practice and based on a pattern of student work on real jobs.

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APPENDIX

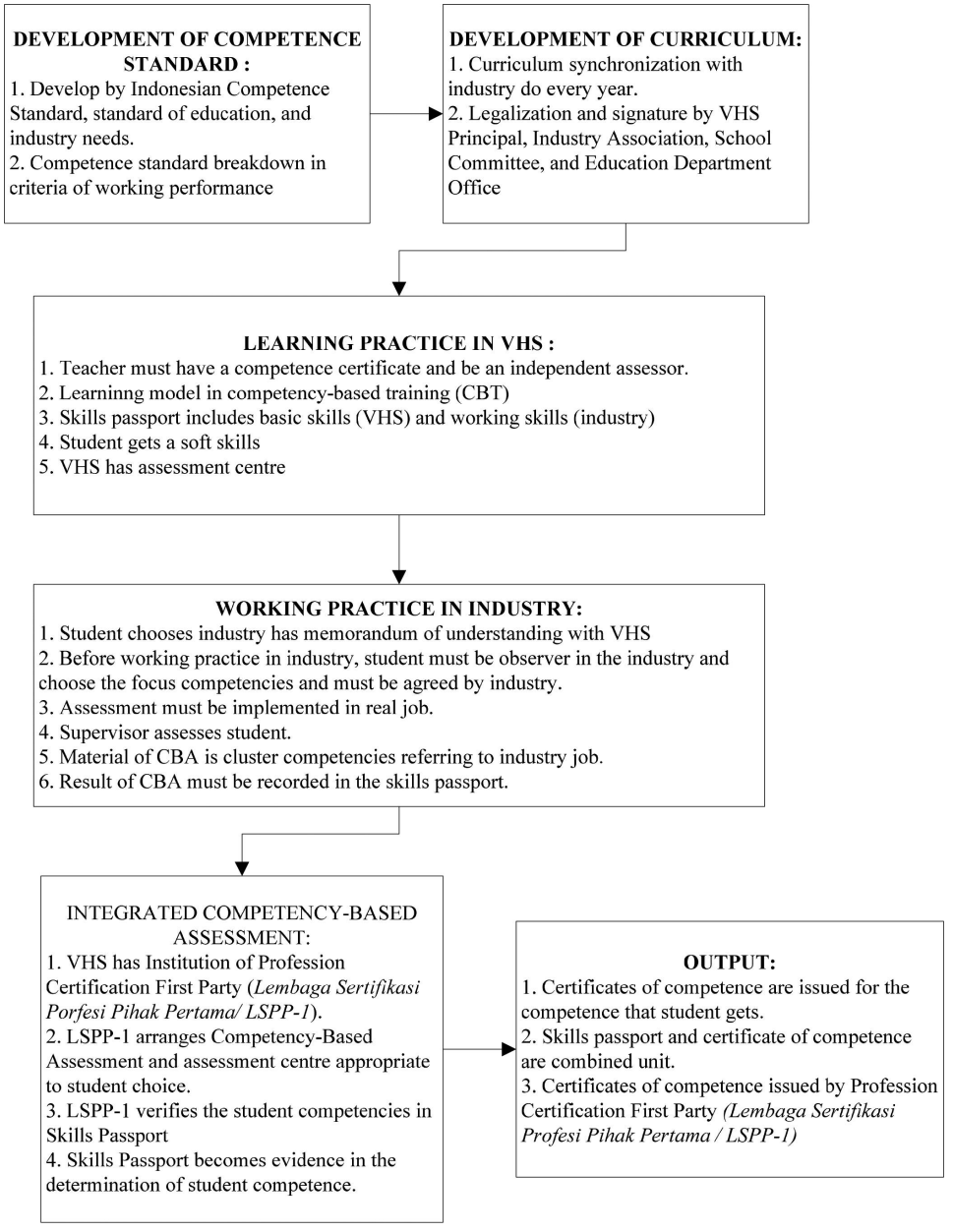

Figure 1. ICBA flow chart.

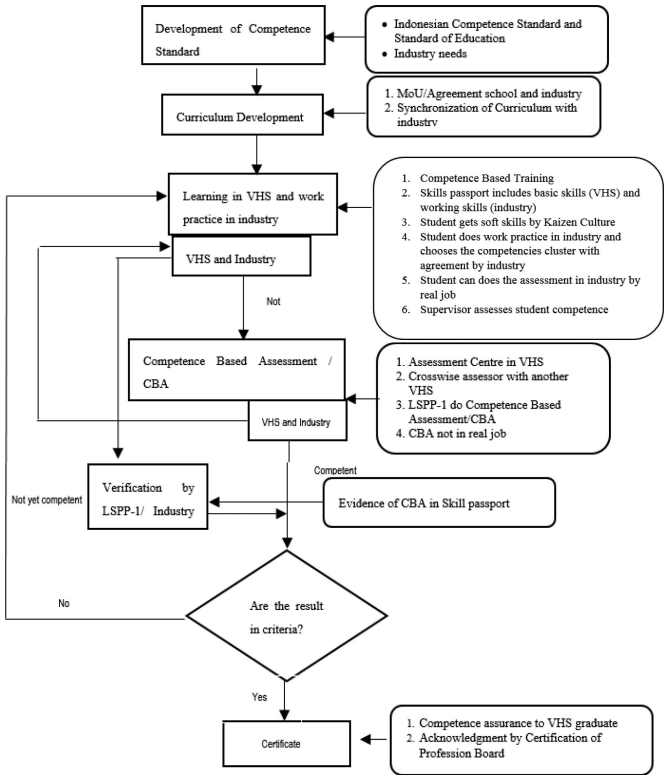

Figure 2. ICBA model.