

GRADUATES' PERCEPTION ON THE GRADUATE COMPETENCES OF THE DIPLOMA III VOCATIONAL EDUCATION OF POLYTECHNIC

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Abstract

The public polytechnic in Indonesia has been established since more than 30 years ago. The establishment of polytechnic education system (PES) in Indonesia was preceded by the needs of skilled technicians who are capable to support the development of industries. These technicians are those who are able to work closely with engineers and are able to translate the concepts into practicable tasks. Assessing the effectivity of the learning management in relation to the learning outcomes achievement, graduate competence profile, and quality of learning is a mandatory to improve the quality and relevance of the PES and to enhance the graduate competitiveness.

Globalisation is causing changes in society as a whole and also in higher education, which is having to adapt to market liberation and to the development of a knowledge and innovation based society. The international mobility of students and teachers is in the forefront, challenging international comparability of the graduate competences of the higher education. Learning outcomes is statements of what a learner knows, understands and is able to do on completion of a learning process. There are several ways for drawing up and categorising learning outcomes in education. Under the umbrella organisation Joint Quality Initiative (JQI, 2004) higher education experts developed a series of descriptors, known as the Dublin descriptors. As a response to the ratification of the International Convention on the Recognition of Studies, Diplomas and Degrees in Higher Education in Asia and Pasific, the Government of Indonesia has developed a national qualifications framework, known as "Kerangka Kualifikasi Nasional Indonesia" (Indonesian Qualification Framework). The Indonesian Qualification Framework (IQF) consist of nine levels of qualifications. The level 9 of IQF is considered as the highest level of qualification, and the level 1 is the lowest level.

In accordance to the Indonesian Qualification Framework, learning outcomes of the Diploma III graduates is considered to be achieved at the qualification level 5, or equivalent to the "short cycles" qualification of the Dublin descriptors.

Research conducted in Politeknik Negeri Bandung (POLBAN) on the graduates' percetion of th graduate competence found that learning outcomes of the Diploma III graduates is equivalent to the 82.1 % of the short cycles qualification of the Dublin Descriptors. Based on the findings, learning outcomes of the Diploma III graduates of the vocational eduaction conducted in the Polytechnic almost reached the learning outcomes to be achieved as stated in the Indonesian Qualification Framework.

Keywords: Graduate Competences, Dublin Descriptors, POLBAN

1. Introduction

Higher education is an important pillar of the development of a nation. As the highest level of education in the national education system, higher education become the key factor in encouraging the development of a nation. In general, education has an important role in promoting economic growth.

Higher education are expected to be a moral force that capable of shaping the character and great culture of integrity; strengthen the national unity through growing a sense of belonging and togetherness; foster a democratic society as a companion for social and political forces; a source of knowledge and the formation of human resources that are responsive to the needs of society

within all social strata (Direktorat Jenderal Pendidikan Tinggi, 2004: 7).

Globalization is happening in this century resulted in the overall change in social life, which is no exception for higher education sector, which must adjust its policy to the liberalization and restructuring of the market and the development of knowledge society and innovation by developing a variety of methods and models of education (UNESCO: 2006: 27).

Student and lecturers mobility between countries provide a challenge for higher education to compare their quality of courses and graduate and also to the labor market needs. Learning outcomes of the education is influenced by the quality of learning of the education institution,

while the quality of learning is influenced by various factors, among others, the professionalism of teachers, teaching facilities, instructional media, cultural institutions, students, teaching methods, and type of program.

Several studies on higher education conducted by the Asian Development Bank and World Bank in recent years stated that the relevance of higher education to the world of work is still low, as well as vocational education held at the Polytechnic. The Global Competitiveness Report 2008-2009 reported by World Economic Forum showed that the index of Higher Education and Training of Indonesia is in the position 71 as shown in Table 1 below.

Table 1. Table 1: Global Competitiveness Index Rankings on Higher Education and Training of Some Asian Countries and Australia

Country	Higher Education and Training		Overall Index	
	Rank	Score	Rank	Score
Singapore	8	5.56	5	5.53
Australia	14	5.44	14	5.23
Malaysia	35	4.63	21	5.04
Thailand	51	4.31	34	4.60
Philippines	60	4.10	71	4.09
India	63	4.06	50	4.33
Indonesia	71	3.88	55	4.25

This figure shows the quality and relevance of higher education in Indonesia is still lagging behind compared to some other neighboring countries. This index is a key factor to promote economic efficiency-driven.

The policy of the Directorate General of Higher Education in achieving the goals of higher education on quality and relevant is aligning the graduates competence to the needs of the community and promote a conducive environment of education and learning processes to produce a graduates who are intelligent, skilled, and good character (Direktorat Jenderal Pendidikan Tinggi, 2010: 4). Evaluation of the education performance especially in vocational education conducted in this study are highly relevant to the policy of the Directorate General of Higher Education in improving the relevance and quality of higher education in Indonesia.

Purpose of this research is to: (1) measure the level and profiles of the competence of the graduates of Diploma III program, (2) study the effect of the professionalism of teachers, learning media, and learning facilities toward the quality of learning, and (3) study the influence of the quality of learning toward the achievement of learning

outcomes of the graduates of Diploma III program at the Bandung State Polytechnic (POLBAN).

2. Polytechnic Education in Indonesia

Vocational education in Indonesia is also known as polytechnic education, has been established for more than 30 years. Vocational education has always been associated with the preparation of labor "ready for use". This means that graduates of vocational education must meet the competence standards in the workplace. Vocational education in Indonesia established by the government was started in 1972, when Intitut Teknologi Bandung in cooperation with the Ministry of Public Works established the Polytechnic Institute of Public Works (LPPU), in response to the challenges of manpower needs of technicians who are able to translate concepts into the science and technology into the practical tasks necessary in the workplace. In the same year Institut Teknologi Bandung established collaboration with Swiss government to set up similar education, named "Politeknik Mekanik Swiss" (PMS), then in 1979 the government established five polytechnics in 5 public universities, i.e. the Bandung Institute of Technology, University of Indonesia, Diponegoro University, Sriwijaya University and the University of North Sumatra.

In the Law Number 20, Year 2003 for the National Education System, stated that higher education is an education after secondary education program that includes the programs of diploma, bachelor's, master's, specialist, and doctoral degrees. Type of education in higher education in Indonesia consists of academic, professional and vocational education. Academic education is directed primarily on the mastery of specific disciplines, professional education prepare students for a job with the requirements of special skills, while vocational education preparing students for a job with a specific applied skills. Vocational education in Indonesia are conducted at the various higher education institutions such as Academy, Polytechnic, College, Institute or University.

Hadiwaratama (2010: 7) depicted the graduates competence level of the Diploma III Polytechnic to be acquired in the context of the education level and employment in the diagram as shown in Figure 1.

Middle-level technicians graduated from Polytechnic Diploma III should be able to translate the concept of science and technology into practical tasks required in the workplace.

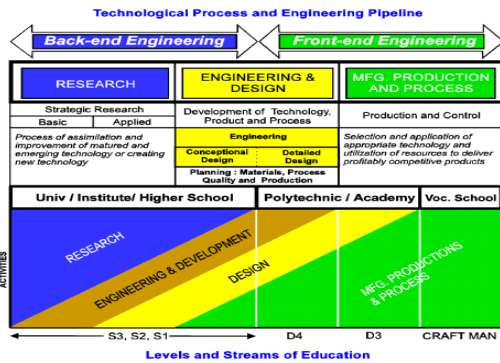


Figure 1. Diagram of Occupational Characteristic vs. Level of Education.

Learning outcomes of the Polytechnic Diploma III graduates is able to apply knowledge into a product design or process or to apply the knowledge into the planning and production control. These technicians are those who are able to work closely with engineers and are able to translate the concepts into practicable tasks.

3. Qualifications Frameworks and Graduate Competence

Qualifications framework defined by Tuck (2007) is an instrument for the development, classification and recognition of skills, knowledge and competencies along a continuum of agreed levels. It is a way of structuring existing and new qualifications, which are defined by learning outcomes, i.e. clear statements of what the learner must know or be able to do whether learned in a classroom, on-the-job, or less formally. The Qualifications Framework indicates the comparability of different qualifications and how one can progress from one level to another, within and across occupations or industrial sectors.

There are several ways for drawing up and categorising learning outcomes in education. Under the umbrella organisation Joint Quality Initiative (JQI, 2004) higher education experts in the European countries developed a series of descriptors, as a continuation of the Bologna declaration in June 1999. The descriptor developed by JQI is known as the Dublin descriptors. (Draft 1 working document on JQI meeting in Dublin on October 18, 2004).

As a follow-up of the ratification of the Regional Conference on Recognition of Studies, Diploma and Degree of Higher Education in Asia and Pacific on December 16, 1983, the government of Indonesia has set up a level descriptors on learning, both formal education, training or work experience in a national qualifications framework with the name of "Kerangka Kualifikasi Nasional Indonesia" (KKNI). As stated in the the Presidential Decree Number 8, Year 2012, KKNI are classification of competence and qualifications

framework that can reconcile, equalizes, and integrate the fields of education and job training and work experience in order to recognize the job competence in accordance with the occupational structure in the various sectors.

Learning outcomes is the main product produced by an educational institution. It is an expression of a statements of what a learner knows, understands and is able to do on completion of a learning process, which is represent the competence to be achieved by the learners. Competence commonly associated with the function and behavior. Competence comes from the Latin word 'competere', which means suitability, usually referred to as the conformity with specific job (Nordhaug & Grønhaug in Nilsson, 2007). In the field of vocational education and training, a person in vocational education and training, people are considered to be competent when they are able to consistently apply their knowledge and skills to the standard of performance required in the workplace. (Department of Education and Training, Western Australia, 2008). Person's competence is achieved in a structured and hierarchical learning, which is achieved within a certain time. Models of competence according to Burke (2005) at least can be grouped into six models, the two models is the model input, i.e., they are based on assumptions about aptitudes, knowledge and skills which individuals possess. Some models specifically refer to knowledge, skills, attitudes, and related concepts like personal effectiveness which are assumed to 'broaden' the concept of competence. These models assume that competence is an individual attribute. Two other models are models of outcomes based on a description of the aspects of the job characteristics (work role), or the result of the performance (outcomes of performance) that have characteristics, based on the description of the work roles, the interaction between technical skills and organizational environment, and dynamic in that they are able to incorporate changes in work organisation and technology since they act as a framework for identifying specific skills which contribute to the outcomes. Another model is the model of job competence. This model is based on the standard input that emphasizes narrow job descriptions and skills to work procedures.

Graduates competence of the Diploma III in this study is defined as the achievement of learning outcomes which refers to the Dublin descriptors for qualifications "short cycle" with a variable competencies include: (a) knowledge and understanding; (b) application of knowledge and understanding; (c) making judgements, and (d) communications.

Dublin descriptors for qualifications "short cycle" which is equivalent to D III Polytechnic qualifications are as follows:

- have demonstrated knowledge and understand-

ding in a field of study that builds upon general secondary education and is typically at a level supported by advanced textbooks; such knowledge provides an underpinning for a field of work or vocation, personal development, and further studies to complete the first cycle;

- can apply their knowledge and understanding in occupational contexts;
- have the ability to identify and use data to formulate responses to well-defined concrete and abstract problems;
- can communicate about their understanding, skills and activities, with peers, supervisors and clients;
- have the learning skills to undertake further studies with some autonomy.

4. Quality Learning

Humans develop into an adults person and have the ability to solve various problems in life because of learning. Winkel (2009: 59) described that "learning is an activity of a mental/psychological, which took place in an active interaction with the environment, which produces a number of changes in knowledge, understanding, skills, attitudes and values. That change is relatively constant and remain in the learner behaviour. Lately, according to Hergenhahn and Olson (2008: 2), psychologists have tended to accept the definition of learning which refers to the changes in observable behavior. One of the most popular definition as proposed by Kimble in Hergenhahn and Olson (2008: 2) which defines learning as a relatively permanent change in behavioral potential that occurs as a result of reinforced practice.

Quality of learning in the context of higher education is the quality of service provided by the university in teaching-learning process which is the interaction of all components of the learning that includes lecturers (teachers), teaching facilities, learning objectives, learning materials, and students. The interaction between the components of learning have to be done efficiently and effectively. Quality of learning is effective learning as measured by customer satisfaction (students) on the learning process conducted in an educational institution. Ramsden (1991: 129-150) has conducted a research to develop a performance indicator of the quality of learning in a higher education. Research was conducted at thirteen universities in Australia, and has previously been conducted in several universities in the UK, by developing a performance indicator of the quality of learning questioner called Course Experience Questionair (CEQ). The result was reported that there is strong empirical evidence that the CEQ is an instrument that is valid and useful in explaining differences in learning performance in an academic unit. Ramsden developed the five dimensions of

measurement, which consists of: (a) good teaching (good teaching), (b) clarity of objectives and learning standards (clear goals and standards), (c) the suitability of the burden of learning (Appropriate workload), (d) conformity assessment (Appropriate assessment), and (e) freedom in learning (emphasis on independence).

In this study, the quality of learning defined as: (a) good teaching, (b) clarity of objectives and learning standards (clear goals and standards), (c) appropriate workload, d) openness to students and (e) freedom in learning.

The factors that affect the quality of learning in this study is restricted on the following three factors: (a) the professionalism of lecturers/teachers, (b) learning media used in the learning process, and (c) the learning facilities provided by the institution.

5. Methodology

Purpose of this research is to study (i) the influence of teacher professionalism to the quality of learning, (ii) the influence of learning media to the quality of learning, (iii) the influence of learning facilities to the quality of learning, (iv) the influence of the quality of learning to the competence, and (v) measures the achievement of learning outcomes of Diploma III vocational graduates held at the Bandung State Polytechnic

This research was conducted by survey method. Data were collected by means of a structured questionnaire to obtain the response of the perception of the three current years graduates from Bandung State Polytechnic (POLBAN). Confirmatory factor analyses and structural equation modeling were utilized in order to find measurement models for each of the constructs and to test hypothesized structural relations between these constructs.

6. Results

Results of the analysis of the hybrid models of the structural learning management model in POLBAN shown in Figure 2 below.

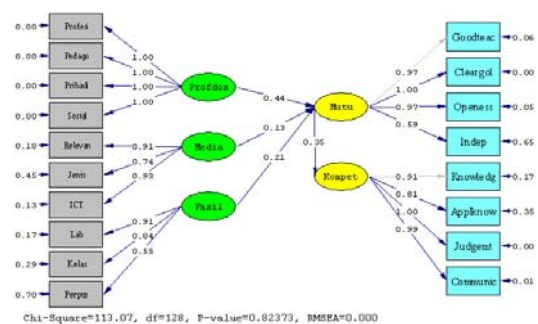


Figure 2. Structural Coefficient of The Structural Learning Management Model POLBAN

The results showed that the professionalism of teachers and teaching facilities have a significant effect on the quality of learning with the structural model coefficients indicated by 0.44 and 0.21 respectively, while the learning media has not significantly influence to the quality of learning with structural coefficient of 0.11. Competence is significantly influenced by the quality of learning with structural coefficient of 0.35.

7. Discussion

The Influence of Teacher Professionalism towards Quality Learning.

These results indicate that the professionalism of teachers have a significant effect on the quality of learning, with a structural coefficient of 0.44. It shows that education in POLBAN more academic-oriented. Moodie (2008: 26-30) states that the academic education and vocational education can be distinguished between "knowing" and "doing", "theory" and "practice" and between "reason" and "experience". Engeström in Moodie (2008: 38) distinguish between vocational education and academic education based on education level. Engeström suggests a hierarchy of study consisting of three sequences, namely the first order of learning (conditioning, imitation and route learning); second order of learning (trial and error or learning by doing and problem solving or investigative learning), and a third order of learning (questioning and transforming the context or community of practice). These sequences are also considered as level of education, where vocational education is at the first level and second level, while the college is located on the second level and third level. Several other authors according to the Moodies, differentiate vocational education with academic education by ways of learning.

Vocational education has historically been identified with the interns in the workplace, where the methods of teaching and learning is done by observation, imitation and correction of personal, rather than by the application of general propositions in the classroom and through textbooks. Another feature of vocational education as set forth in ISCED 97 (UNESCO 1997: paras 57-9) that vocational education or technical education emphasis on developing practical skills, practical knowledge (know-how), and an understanding of certain jobs.

Learning process conducted in POLBAN shows the portion of the theory conducted in the classroom is greater than in practical activities conducted in the laboratory and workshop, so that learners are more confident that the quality of learning is determined by the professionalism of teachers while teaching in the classroom.

Teacher professionalism scores are perceived by the graduates by 77.04% from the ideal score. This value represent a good category. Teacher professionalism scores consists of four sub-variables, namely, professional competence, pedagogical competence, personal competence and social competence. Professionalism of teachers score are highest in the values of social competence, which is 78.24%, while the lowest value is professional competence, which is 75.76%.

The Influence of Learning Media towards Quality Learning

These results indicate that the learning media has not significantly influence the quality of learning. Structural coefficient of learning media on the quality of learning is 0.13. Such conditions showed that the learning media as an important factor in shaping the learning was not paid good attention. The availability and suitability of teaching materials which is relevant to the learning objective, the use of ICT in teaching and learning, providing practical guidance is still inadequate. Generally most of the learning activities in POLBAN conducted in the classroom with a method of "lecturer" so that the utilization of learning media, especially media to support learning in workshops and practical activities in the laboratory, were less utilize.

The selection of learning media in accordance with the material to be taught is explained by Brunner (Arsyad, 2011:7 and Munadi, 2008: 14), that there are three kinds of human experience in acquiring knowledge, i.e., the direct experience (enactive), the pictorial/ picture experience (iconic) and the abstract experience (symbolic). Levie and Levie (Aysyad,2011: 9) explained that learning through visual stimulus (viewing) yielded better learning outcomes for tasks such as recall, recognize, recall, and a link between facts and concepts, while learning the verbal stimulus (hearing) gave better results for learning that involves the sequential memory. Mursell (Munadi, 2008:10) explained that successful learning is learning by experience. It is also consistent with the analysis in Dale (Arsyad, 2011: 10) that direct experience (experienced by myself) have a place in the main and largest cone of experience.

The Influence of Learning Facilities towards Quality of Learning

Results of this research showed that learning facility has a positive and significant impact on the quality of learning. The influence of learning on the quality of learning facilities, indicated by the coefficient of the structural model by 0.21.

According to the West and Danny (Leung and Fung, 2005: 585-594), facilities is one of the assets

of the organization to support employees to achieve business goals. Educational facilities in the organization intended to provide a learning environment for students to learn well. In his research, Leung found that facilities management (space management, teaching aids, lighting and ventilation of classrooms, a comfortable environment) affects students' learning behavior. Provision of a good learning facilities is in line with the analysis of Dale on the acquisition of knowledge through the experience described in Dale Cone of Experience, that the direct experience (experienced myself) have a place in the main and largest cone of experience.

Refers to the process of learning conducted in POLBAN, the use of time for practical activities is less than 50% of the total teaching and learning activities, so that, the perception of the graduates on the quality of learning is more determined by the process of learning conducted in the classroom than process of learning conducted in the laboratory or workshop. The obsolescence and unsuitability of education facilities in POLBAN promote the perception of the graduates to consider that the quality of learning is less influenced by the learning facility.

The Influence of The Quality Learning towards Graduates Competence

The results showed that the quality of learning has a positive and significant impact on the graduates competence with the coefficient of structural 0.35. According to Sutisna explanation (1989: 35) that the educational administration is a process that makes human resources and material available and effective for achievement of educational goals, as well as explained in the White Paper of the British government on the Future of Higher Education (Department for Education and Skills, 2003, p .7) identifies that "Effective teaching and learning is essential if we are to promote excellence and opportunity in higher education. High quality teaching must be recognised and rewarded, and shared best practice ". Thus, effective learning or the quality of learning will influence the effectiveness of educational goals to produce a graduates who are competent in accordance with the predetermined level of qualification.

Quality of learning in POLBAN significantly influenced by the professionalism of teachers and teaching facilities with the structural model coefficients indicated by 0.44 and 0.21 respectively, while the learning media has not significantly influence to the quality of learning with structural coefficient of 0.11.

The instrument to measures the quality of learning in this study focused more on teaching and learning in the classroom, it is represented by the

performance of teachers while teaching and learning. This situation influences the perception of the graduates, where graduates competence is influenced significantly by the quality of learning.

Profile and Level of Graduates Competence

Achievement of level of competence was measured using an instrument based on the research of Allen and Ramaeker (2008: 72-78) which consists of 12 measurement variables, namely, knowledge, application of knowledge, critical thinking, equipment selection, problem solving, administration and management, data analysis, speaking, reading, communication, english and writing. The results of measurement are presented in Figure 3.

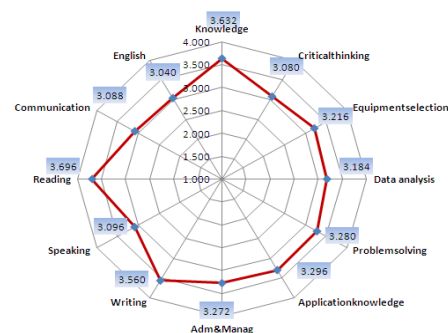


Figure 3. Score of Diploma III Polytechnic Graduates Competence

The results showed that there are three measurement variables that have a score above 3.5, i.e., knowledge, reading and writing. These data indicate that the above competencies are taught well, while the other three variables had a low score close to a score of 3, i.e., English language skills, speech, critical thinking, and communication skills.

Dublin descriptors for qualifications "short cycle" consists of five dimensions, i.e.: knowledge, application of knowledge, making judgments, communication skills, and continuous learning. The achievement of level of competence of the Diploma III graduates is presented in Figure 4

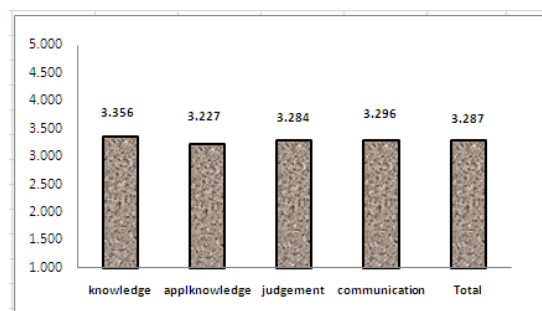


Figure 4. Level of Diltoma III Polytechnic Graduates Competence Compared to The Dublin Descriptors.

The results showed that the average score of Diploma III POLBAN graduates was 3.287 instead of 4 for the maximum score, or 82.10% equivalent to the qualification of "short cycle" in the Dublin descriptors, or equivalent to level 5 of KKNI.

8. Conclusions and suggestion for further research

The conclusion from the results of this study can be described as follows:

1. The Quality of learning in POLBAN is positively and significantly influenced by the professionalism of lecturers and learning facilities, and less influenced by learning media.
2. Graduates competence of the Diploma III in POLBAN is positively and significantly influenced by the quality of learning.
3. Levels of graduates competence of the Diploma III POLBAN is 82.10% equivalent to the qualification of "short cycle" in the Dublin descriptors, or equivalent to level 5 of KKNI.

Further research in this area will be valuable. It would be useful to develop and validate a new instrument to measure the level of competence in accordance with the KKNI.

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