Competency Profile for World of Work in Learning of Computer Information Technology Expertise at Vocational High School

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The problems which faced by Vocational High School (SMK) is a gap between vocational competence and the competence which needed by work force. One of the many programs in vocational skills that need improvement is the expertise teaching of computer information technology (ICT). Therefore the aims of this study are, (1) to identify the profile of ICT competencies which needed in the work-environment and (2) an overview of the standard competence required in ICT learning in SMK. This research is a descriptive research. The populations of this study are teachers of SMKN1 Pallangga, SMKN1 South Sulawesi and SMK Telkom. The sample study is using cluster method. The identification of labor competencies needs acquired through workshops with expert workers, using DACUM technique. The justification of competency standards data required by world of business and work (DUDI) validated in a focus group discussion (FGD) by ICT experts, 12 lecturers and teachers. The result of the validation is a profile of basic competency, and then analyzed by using quantitative descriptive method, collected then illustrated descriptively, and creating a general inference. Qualification answers were divided into two categories, referring Sudjiono (2006). The results from this study are the standard competency profile of ICT required by DUDI, response of teachers and students about the suitability of the application of DUDI competence in learning at schools.

Keywords: Vocational High School, Competency Profile, DUDI, ICT Learning.

1. INTRODUCTION

The impacts of Information and Communication Technology (ICT) development are very fast, resulting in a shift in the way of the people looking for information, the people are not only limited by the field of education in their environment, but they can attain education from somewhere. Education in Indonesia, especially the vocational education system prepares graduate as mid-level skilled manpower, competent in their fields to compete on finding a job at the time of the Asian Economic Community. The purpose of vocational education is to prepare students to work, have life decent life and be a good citizen.[1]

Unemployment mid-level graduate in South Sulawesi became a potential increase in the number of unemployed workers productive every year.[2] Cumulatively, unemployment in Makassar and all cities in South Sulawesi in the first quarter of 2015 are reaching 218.311 people. Further explained, that in order to reduce the potential of unemployment is planned cooperation to business associations, labor, suitably qualified and needs competency.[3]

Along with the advancement of science and technology in the ICT expertise, since 2000, UNESCO had supported primary and high schools to use ICT. Government regulation[4] supports that every teacher should be able to take advantage of technology in teaching as well in evaluating learning outcomes.

However, the problem that SMK face is the gap between the competence of students in vocational education and national ability standards competence of Indonesia (SKKNI) has not been reached. SKKNI is a description of capabilities that include aspects of knowledge, skills and attitudes that must be possessed by students at SMK. According to Telkom PDC center director[5] that the manpower needs of competency expertise IT, is very high, employment growth in Indonesia only 9.2% per year.

Powered survey Vocational Technology Education students, Universitas Negeri Makassar, that the implementation of the Industry Employment Practices at SMK (Prakerin), is generally not in accordance with the competence the world of business and industry.[6] Competence needs and learning systems must be synchronized within the curriculum. Sukardi[7] claimed that that vocational education in charge of forming the learner has the ability, knowledge, skills in the industry even supposed to master the engineering concepts that exist in the industry.

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Therefore, it is necessary to evaluate the ICT learning system at SMK. 2013's curriculum (the curriculum that being used) should be synchronized with the skill needed by DUDI. This will support the link and match of SMK with DUDI.

One of the few programs in ICT expertise field which important and require revamping of the teaching program is the Computer Engineering and Networks (TKJ). The fundamental problem in this TKJ lessons is the basic competencies that must be mastered by the student, it is important to tailor the TKJ lessons to the expertise needed as an ICT workforce. Based on these problems, the purpose of this study was to identify the basic competency profiles and an overview of basic competencies needed in TKJ lessons.

2. RESEARCH METHODS

This study belonged to the descriptive method, which describes the requirements of the work competency profile and the needs of DUDI-competence based learning in ICT field at SMK. Through workshops with DACUM technique[8] found competency DUDI work involving skilled workers in field ICT. DACUM (Develop A Curriculum) technique is a table that outlines the work, outline of duties, and the necessary capabilities employee. Furthermore, to identify and validate the basic competencies carried out through focus group discussions (FGD) by a team of experts and practitioners, referring to the competency-work and curriculum in 2013.

Experiments of DUDI competency-based learning performed at Vocational High Schools to get the users' response. The study populations are the work-environment in the field of ICT and teachers SMKN1 Pallangga, SMKN1 South Sulawesi, and SMK Telkom. The next stage of data collection is to use data collection instruments. Instrument items developed from the DUDI competence profile.

The instrument is divided in two types, the first instrument is a questionnaire for students and the second instrument is a questionnaire for teachers. Instrument for the students is used to get their response on the implementation of DUDI competency-based learning. And the teachers' instrument is used to get their response to the basic competence conformity with

competency TKJ. Instruments disseminated through three SMK, which involves 120 students and 18 teachers.

Qualification instrument answers were divided into two categories. Teacher's response measurements made using a Likert scale instrument, and based on the assessment criteria for competence aspects of cognitive, affective, psychomotor, which can be seen as shown in Table I. The measurement of student responses is using the assessment criteria of yes and no, in Table II.

The data collection technique for teacher response is using instruments such as in Table I, the data collection technique for student responses, using instruments such as in Table II.

Table III.   Draft of competency profile _TKJ_.

No	Basic competencies	Aspects of competence cognitive, affective, psychomotor
1	Practice the values of faith	a. Understanding the values of faith according their religion b. Understanding the environmental regularity of employment c. Getting used to live mutual respect, and ensuring orderly working environment.
2	Presenting the results of the administration of network resources	a. Understanding the resource administration of computer networks. b. Test reports of cooperation c. Configure resource sharing within the network
3	Describing the greatness of God	a. Knowing individual work and group b. Assessing regularity in reporting c. Demonstrate scientific behavior in daily activities.
4.	Understanding the network operating system security	a. Examining the results of resource sharing within the network b. Understanding the types of security the network operating system c. Configure network security systems and testing network security system
5	Understand how to configure the operating system integration with a network (internet)	a. Identify the function of sharing network b. Examining the results of resource sharing within the network c. Understand communications (IP), tools (tools), and a digital system (how many ports).
6.	How to install the software for network monitoring	a. Configure the network monitoring tools b. Understanding the function of monitoring network c. Presenting the results of using the network monitoring software
7	Presenting the results of the configuration of the operating system integration with a network (internet)	a. Understanding the types of security the network operating system b. Understanding IP management, each devices must has an identified IP c. Presenting the results of the configuration of traffic and bandwidth management on network
8	Understanding how traffic management and bandwidth on the network	a. Server audit process b. Installing software for network monitoring c. Understanding how traffic management and bandwidth on the network
9	Understand how to configure the operating system integration with a network (internet)	a. Understanding importance of cohesion in the work b. Understanding to configure integration with the network operating system c. Enabling Integration with the network operating system (Internet)

Table I.   Teacher questionnaire response.

			Criteria/scoring		
No.	Rated aspect	Item statement	Urgently require/(3)	Need/(2)	Enough/(1)
1	Cognitive Affective Psychomotor	9 9 9			

Table II.   Students questionnaire response.

			Criteria/scoring	
No	Rated aspect	Item statement	Yes/(1)	No/(0)
1	Attractiveness	4		
2	Conformity	5		
3	Theory	6		
4	Autonomy	8		
5	Motivation	5		

Table IV. Decent instrument.

No	Sheets instrument assessment	Mean	Coeffisien Cohen's kappa (r)	Category
1	Student responses on learning process basic competence-*TKJ*	3.73	$0.82 \geq 0.70$	Decent
2	Teacher responses to basic competency profile-*TKJ*	3.74	$0.83 \geq 0.70$	Decent

To measure the level of inter-rater reliability on the results of the instrument validation by expert, analyzed statistically Coeffisien Cohen's Kappa and Percentage of Agreements.[8] Because there are two people validator then used statistical Percentage of Agreements reliability coefficient (r) ≥ 0.70.

3. RESEARCH RESULTS

3.1. Results of Needs Analysis

The result of the needs analysis phase is the work-competency matrix. This analysis is done in a workshop with DACUM technique, involves 15 ICT expert workers, to outline of duties and the necessary capabilities, which is already in the matrix. Work-competency matrix is a source of information that was further validated by a team of experts and practitioners; those are 9 teachers and 3 lecturers, through the FGD. FGD result is a draft of competency profile (Table III), which later became the aspects of basic competencies of learning in schools.

3.2. Instrument Questionnaire Results

Results of the content validation by two experts show that the instrument is feasible. The results of the questionnaire, the responses of 120 students, to process learning basic competence TKJ, can be seen in Table V.

Table V. Student responses on learning process basic competence-TKJ.

		Results respondents	
		Urgent	Not urgent
No	Aspects of competence	Frequency	Frequency
1	Practice the values of faith	120	0
2	Presenting administration of network resources	119	1
3	Describing the greatness of God	58	62
4	Understanding the network operating system security	119	1
5	Understand operating system integration with a network (internet)	120	0
6	How to install the software for network monitoring	118	2
7	Presenting the configuration of the operating system integration with a network (internet)	120	0
8	Understanding how traffic management and bandwidth on the network	119	1
9	Understand the operating system integration with a network (internet)	120	0

Table VI. Teacher responses to basic competency profile-TKJ.

		Results respondents		
		Urgently required	Needed	Enough
No	Aspects of competence	Freq.	Freq.	Freq.
1	Practice the values of faith	18	0	0
2	Presenting the results of the administration of network resources	16	2	0
3	Describing the greatness of God	2	8	8
4	Understanding the network operating system security	16	2	0
5	Understand how to configure the operating system integration with a network (internet)	15	3	0
6	How to install the software for network monitoring	16	2	0
7	Presenting the results of the configuration of the operating system integration with a network (internet)	18	0	0
8	Understanding how traffic management and bandwidth on the network	18	0	0
9	Understand how to configure the operating system integration with a network (internet)	16	2	11.1

4. DISCUSSION

4.1. Achievement of a Competency Profile

The results of the workshop with a DACUM technique is matrix is work competence from DUDI. Matrix Competence be a source of information that was further validated by a team of experts and practitioners, those are 9 teachers and 3 lecturers, through the FGD. FGD has been analyzed and validated competency matrix to find of the competency profile.

4.2. Achievement of Validation Instrument

Validation is performed on the two instruments. They are instrument student questionnaire responses and the response of teacher, which will be used as an assessment sheet. The assessment sheets were validated by two experts in their fields. The assessment results analyzed with the aid of computer statistics, and found that the averages of kappa coefficient greater than 0.70, namely sheets instrument students ($0.82 \geq 0.70$) and instrument teachers ($0.83 \geq 0.70$).

4.3. Achievement of Results Instrument Questionnaire

Figure 1 is the result of the analysis of student responses on learning process basic competence-TKJ, involving
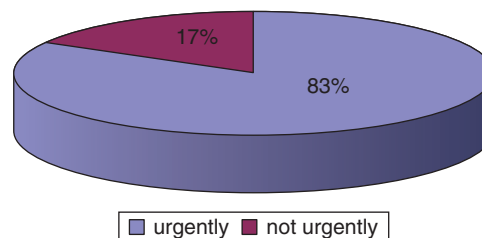

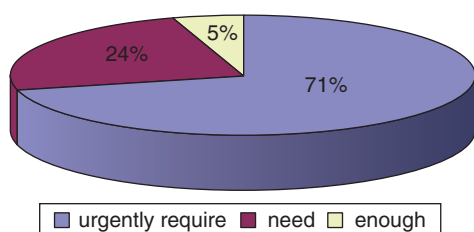**Fig. 1.** Student responses on learning process basic competence-TKJ.

Fig. 2. Teacher responses to basic competency profile-TKJ.

120 respondents, 83% declare it urgent, and only 17% declare it was not urgent.

Figure 2 is results of the analysis of teacher responses to basic competency profile-TKJ, involving 18 respondents, comprised of 12 teachers and 6 lecturers of ICT. 71% stated it urgently required, 24% stated it needed and only 5% declare it that they have enough basic competence in learning of TKJ.

References and Notes

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