Relevance of Civil Engineering Vocational Education Graduates' Competence with Productive Skill Teacher Competency

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Abstract

This study aims to analyze the relevance of the competence of Civil Engineering vocational Education Department graduates with the competence of productive skill teachers in vocational schools. Competencies analyzed in this studywere pedagogic competence and professional competence. This study was descriptive quantitative then converted and summed up into qualitative form. The subjects of this study were 24 respondents from the alumni of Civil Engineering Vocational Education Department, UNNES class of 2008, 2009, 2010, and 2011. Data collection was conducted using questionnaires and documentation. The data were analyzed using descriptive percentage. The result of the studywas the relevance level of pedagogic competence and professional competence of the graduatesof the Civil Engineering Vocational Education Department that has become productive skill teachers. The relevance percentage of the curriculum of Civil Engineering Vocational Education Department with the curriculum of Civil EngineeringEducation program at the vocational schools was 84.88%. It showed that curriculum structure of the curriculum of Civil Engineering Vocational Education Departmenthad slight irrelevance withthat of Civil EngineeringEducation program.A curriculum structurewas not relevant. The relevance percentage of the pedagogic competence of the Civil Engineering Vocational Education Department with the curriculum of Civil EngineeringEducation program at the vocational schoolswas 86, 50%. This percentage meant that the curriculum at Civil Engineering Vocational Education Departmenthas not been all relevant to those demanded in the curriculum of Civil EngineeringEducation program at the vocational school. However, the pedagogic competence of Civil Engineering Vocational Education Department'graduates can be categorized as very relevant. The percentage of professional competence showed88.81%, which meant that for professional competence of Civil Engineering Vocational Education Department' graduates can be categorized as very relevant.

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INTRODUCTION

The quality of human resources is a fundamental factor that must be considered to face the competitiveness and productivity of the industry in the era of globalization. One of the efforts in improving the quality of human resources is education. Education sector is required to continuously improve the quality and develop the concept of learning that can provide significant results in the improvement of skills or competencies. Ideally, education should be relevant to the current employment of the industry.

The level of graduates' employment by field of employment depends on the quality of the graduates obtained from the high integration of skills, knowledge and ability of the graduates themselves. Widarto, Pardjono and Widodo argue for these following results:
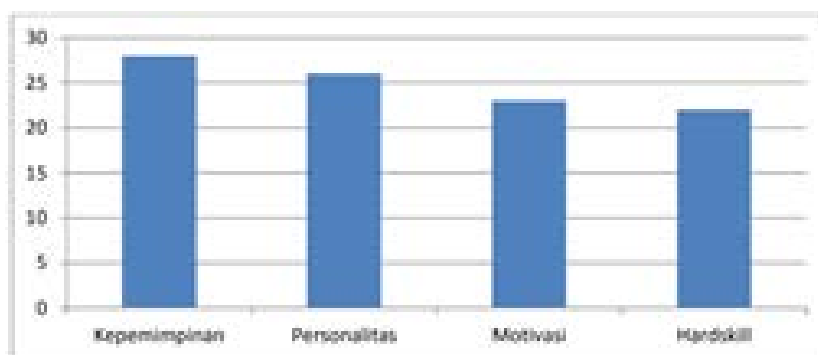
Figure 1. The results of the needs in industry

The figure above explains that the needs of the industry in recruiting workers and developing career arehard skills and soft skills with the ratio of 1:3.

Not all educators are relevant to the needs of the industry. In addition, the more concerning is the irrelevance of the quality of education with employment requirements. The lack of relevance between education and the industry is indicated by looking at the number of current intellectual unemployment. According to Central Statistics data, in February 2016,the unemployed graduates reached 695,000 million. This figure increased 20 percent compared to February 2015. Ideally, a country's unemployment rate is at 3 percent to find supply and demand from the number of job seekers and the amount of labor needs.

The amount of unemployment is mainly caused by theirrelevance of graduates' competence with the demands of the industry.The level of relevance between educational programs in schools with the needs of the industry is still low. If such conditions are left unchecked, there will be multiple negative impacts.On the one hand, there is a huge waste of money due to the cost of education spent by the government and the community. On the other hand, the needs of the human resource are not met.

The research was conducted to determine the relevance of the competence of Civil Engineering Vocational Education Department's graduates with the competence of the productive skill teacherby analyzing pedagogical competence and the professional competence of the productive skill teachers at vocational schools where the graduates worked.

METHODS

This research used descriptive and quantitative then was converted and summed up in the qualitative form. This research of the competence of the Civil Engineering Vocational Education Department graduates withthe productive skill teacher is aimed to determine the level of relevance

between the competence of the Civil Engineering Vocational Education Department's graduates withthe productive skill teacher's competence.

The data were collectedusing questionnaires and documentation. This research was conducted in several vocational schools in Central Java: SMK N 1 Kedungwuni, SMK N 1 Adiwerna Tegal, SMK N 1 Blora, SMK 2 Cilacap, SMK N 2 Kebumen, SMK N 2 Sragen, SMK Ganeshatama Boyolali, SMK Sunan Kalijaga, SMK N 1 Blora, SMK N 1 Mandiraja, SMK Yasiha Gubug. Thenonprobability sampling there is saturated sampling technique that is determination technique sample when all members of the population are used as a sample (Sugiyono,2010: 124). This non - probability sampling technique was used in this research. The saturated sampling was used when facing a relatively small population. The respondents in this study were 24 people who were alumni of the Civil Engineering Vocational Education Department from 2008 to 2011. There were 10 items on the questionnaire on the pedagogic competence and 14 items onthe professional competencequestionnaire. The success rate was adjusted / modified to be: highly relevant, relevant enough, and less relevant. The data obtained from the field in the form of quantitative data in the form of a percentage, then the score was then converted into qualitative criteriaas presented Joko Widodo (2001: 236) as follows:

Table 1. The criteria of the results

Percentage of the Relevance Level	Criteria	Information
> 85%	Very relevant	
≥ 70 % X ≤ 85%	Relevant	
< 70%	Less relevant	

Ghazali (2011: 201) argues that "the steps taken in the use of this analytical technique are as follows":

    a. Collecting the questionnaires that have been filled by respondents by checking its completeness
    b. Converting a qualitative score into a quantitative score
    c. Create a score tab
    d. Using in the percentage descriptive formula as follows

$$P = \frac{n}{N} x 100\%$$

where:

P =Percentage of specified variables

n = Score on each item

N= The sum of all scores

Creating a lookup table, set the highest percentage and the lowest percentage, percentage range, the class interval.

Summed up into qualitative form.

Prior to analyzing the relevance of pedagogic and professional competence, the alignment of the curriculum between Civil Engineering Vocational Education Department of UNNES and Civil Engineering Vocational Educationprogram at the schools.

Table 2. The descriptive criteria of the curriculum relevance percentage

No	Interval %	Relevance Level
1	84 - 100	Very relevant
2	67 - 68	Relevant
3	52 - 52	Slightly relevant
4	36 - 51	Irrelevant
5	20 - 35	Very irrelevant

Table 3. The descriptive criteria of the pedagogical competence percentage

No	Interval %	Relevance Level
1	84 - 100	Really understand
2	68 - 67	understand
3	52 - 52	Slightly understand
4	36 - 51	Don't understand
5	20 - 35	Really understand

Table 4. The Descriptive Criteria of the professional competencepercentage

No	Interval %	Relevance Level
1	84 - 100	Really understand
2	68 - 67	understand
3	52 - 52	Slightly understand
4	36 - 51	Don't understand
5	20 - 35	Really understand

Test of Validity

Validity test in this study was performed by using item analysis that correlated the score of each item with a total score which is the sum of each item' score. If any item is not valid, then the item was not be further investigated. The criteria of validity according to Sugiyono (2010: 134) are as follows:

a. If r ≥ 0.30, then the item of the questionnaire is valid,
b. If r ≤ 0.30, then the item of the questionnaire is invalid.

Instrument validity test was performedusing Pearson Product Moment according to Sugiyono (2010: 183) as follows:

$$r_{XY} = \frac{N\sum XY - (\sum X)(\sum Y)}{N\sum X^2 - (\sum X^2) \quad N\sum Y^2 - (\sum Y^2)}$$

where:

rxY	= Correlation Coefficient
N	= Number of Sample
$\sum X$	= Total score of items for X variable
$\sum Y$	= Total score of items for Y variable
X	= The score of each item
Y	= Total score of items

Table 5. Instrument Validity Test Results

Variable	Indicator	Validity
		Valid
	Understanding to the students	Valid
		Valid
		Valid
	Lesson planning	Valid
Pedagogic competence		Valid
		Valid
	The precision of the evaluation instrument	Valid
		Invalid
		Valid
	The ability of developing students' potential	Invalid
		Valid
Variable	Indicator	Validity
		Valid
	The mastery of the subjects	Valid
		Valid
		Valid
	The ability to open the lesson in the class	Valid
Professional competence		Valid
		Invalid
	The questioning ability	Valid
		Valid
		Valid
	The ability in creating variation in the class	Invalid
		Invalid

Reliability Test of the Instruments

Reliability test according to Riyadi 2000 (in Faisal Amri 2009: 35) is conducted to find out how consistent the results of the measurement are when measured twice or more against the same symptoms using the same instrument. Reliability test was conducted using Alpha Cronbach (α) which was quoted from Ety Rochaety (2007: 54) with the following formula:

$$\alpha = \left(\frac{K}{K-1}\right)\left(\frac{s_r^2 - \Sigma s_i^2}{s_x^2}\right)$$

Where :

α   = *Alpha Cronbach* Reliability Coefficient
K   = Number of items
$\Sigma S^2 i$ = Number of variance score items
SX ^{2} = Variance test score

An instrument has a high degree of reliability if the value obtained is ≥0.60 (Imam Ghozali, 2002: 133). Therefore, the purpose of validity and reliability test of the questionnaire is to make sure that thequestionnaire could really measure measuring symptoms and generate valid data.

Table 6. Instrument Reliability Test Results

Variable	Cronbach's criteria	Cronbach's Alpha	Information
Pedagogic Competence	1.89	0.6	Reliable
Professional Competence	1.44	0.6	Reliable

RESULT AND DISCUSSION

The results of the analysis showed one competence / curriculum at vocational schools that was not relevant with the 2008 curriculum of the Civil Engineering Vocational Education Department, UNNES. The 2008 curriculum of the Civil Engineering Vocational Education Department, UNNES has 43 subjects with these following categories: Personality Development Subjects (MPK), Scientific and Skills Subjects (MKK), Productive Skills Subjects (MKB), ProductiveBehaviorSubjects (MPB), Community Behavior Subject (MBB). Theexisting curriculum of Civil Engineering Vocational Education Department was the 2013 curriculum. It has the different names for each skill program and skills competencies. However, the content of the coverage is similar to that of the previous curriculum .

Table 7. The results of curriculum relevance

No	Relevance Level	Percentage
1	Very relevant	84.88%
2	Relevant	0
3	Slightly relevant	0
4	Irrelevant	15.12%
5	Very irrelevant	0

The data were obtained from 24 respondents who have become teachers in Civil Engineering Vocational Education Department. The data showed the percentage of relevance between 2008 curriculum of Civil Engineering Vocational Education Department, UNNES with the curriculum of the vocational schools is 84.88%. It is categorized as very relevant. 15.12% do not respond to the item. Relevance of Pedagogic and Professional Competence of Productive Skills Teachers

The indicators used as a reference in this research were to figure out the pedagogic competence of the productive skill teachersat the vocational schools.

Table 8. The components of pedagogic competence

No	Indicators
1	Understanding to the students
2	Lesson planning
3	The precision of the evaluation instrument
4	The ability of developing students' potential

Table 9. Percentage of Pedagogic Competence

No	Pedagogic Competence	Percentage	Category
1	Understanding to the students	88.61%	Really understand
2	Lesson planning	89.17%	Really understand
3	The precision of the evaluation instrument	82.08%	Understand
4	The ability of developing students' potential	83.75%	Understand

It can be seen from the table that the highest percentage in pedagogic competence indicators is the understanding of the students.

Table 10. Professional Competence Variable Indicators

No	Variable	Indicator
1	The mastery of the subjects	Mastering the subjects of the study
		Developing the material for the learning process
		Explaining the aim of the learning process at the beginning of the class
2	The ability to open the lesson in the class	Greeting and praying before the class begins
		Motivating the class at the beginning of the class
		Reviewing the material to the students
2	The questioning ability	Giving explanation about the validity of students' answer
		Asking the students clearly by using proper language
3	The ability in creating variation in the class	Using variation of the teaching method
4	The clarity of explanation	Conducting learning process outside the class
5	Classroom management	Creative conducive learning process
		Communicating effectively with the students
6	The ability to close the class	Conducting evaluation (written or oral) when closing the class
7	The punctuality of the time and subjects	Conducting the class as the time allotment

Table 11. The percentage of Professional Competence

No	Indicator	Percentage	Category
1	The mastery of the subjects	83.89%	Good mastery
2	The ability to open the lesson in the class	85.28%	Really good mastery
3	The questioning ability	82.50%	Good mastery
4	The ability in creating variation in the class	88.33%	Really good mastery
5	The clarity of explanation	81.67%	good mastery
6	Classroom management	87.08%	Really good mastery
7	The ability to close the class	86.67%	Really good mastery
8	The punctuality of the time and subjects	80.00%	good mastery

The Level of Relevance Between the Competence of Civil Engineering Vocational Education with that of Vocational Schools

The relevance percentage of the final results of this study can be seen in this following table:

Table 12. Criteria Results of the Research

Percentage of the Relevance Level	Criteria	Information
> 85%	Very relevant	
≥ 70 % X ≤ 85%	relevant	
< 70%	Less relevant	

Based on the table above, if the percentage of relevanceis more than 85% then the criterion of assessment is very relevant.If the percentage of relevance is greater than 70% to less than 85% then the criterion of assessment is quite relevant. If the percentage of relevance level is less than 70% then the criterion of assessment isless relevant.

The following figure illustrates the relevance of Civil Engineering Vocational Education's graduates competence, UNNES with that of productive skill teacher.
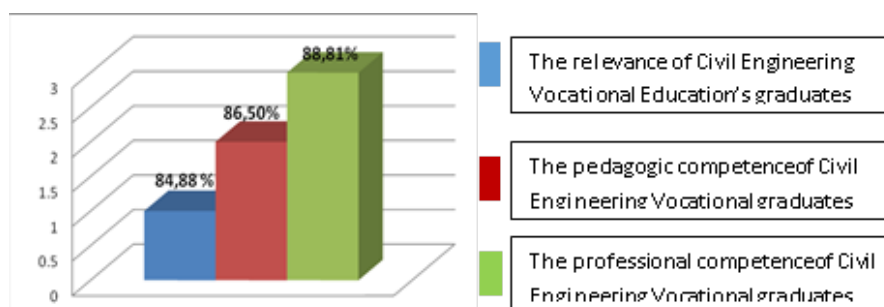
Figure 2. illustrates the results of this research

The figure above illustrates the results of this research. The curriculum of Civil Engineering Vocational Engineering, UNNESis not allrelevant with that of the vocational education. One subject in the curriculum of the Civil Engineering Vocational Engineering, UNNESthat is not relevant that the competency is "Maintenance of buildings and their parts". Although, the respondents respondedthatthey did not get the subject during their study in UNNES, the respondents learnt about the material when trying to teach it. The percentage of pedagogic competence of Civil Engineering Vocational Education graduates, UNNES shows 86.50%. This high percentage means the pedagogiccompetence of Civil Engineering Vocational Education Department graduates is very relevant.

The percentage of professional competence of Civil Engineering Vocational Education graduates, UNNES shows 88.81%. This high percentage means the professionalcompetence of Civil Engineering Vocational EducationDepartment graduates is very relevant.

CONCLUSION

The percentage of pedagogic competence of Civil Engineering Vocational Education graduates, UNNES shows 86.50%. This high percentage means the pedagogiccompetence of Civil Engineering Vocational EducationDepartment graduates is very relevant. The percentage of professional competence of Civil Engineering Vocational Education graduates, UNNES shows 88.81%. This high percentage means the professionalcompetence of Civil Engineering Vocational EducationDepartment graduates is very relevant.

The relevance of productive skill teachers to the pedagogic and professional competence of productive skills teachers in vocational schools is quite relevant.

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