Developing an Evaluation Instrument for Communication Program between Vocational High Schools and Industries

Suranto Aw

Universitas Negeri Yogyakarta, Yogyakarta, Indonesia

Abstract **– One of the criteria of the success of vocational high school (VHS) education is producing graduates who master competencies based on the standards required by industries. The efforts to produce graduates who meet the required competency standards are realized by implementing communication programs and collaborations of schools with industries. This study is aimed at developing eligible instruments for evaluating communication programs between schools and industries. The design of the instrument is tested to determine its feasibility. The instrument is feasible to use, because it has met the criteria in which all items have a validity and reliability measure.**

Keywords **– Evaluation instrument, Communication program, Vocational school, Industry.**

1. Introduction

The document of the national education planning in Indonesia states that the 2015-2020 period is referred to as the period of regional competitiveness. The implementation of education in this period focuses on improving the quality of education that promotes regional competitiveness at the ASEAN level. Then, the education implementation in the period of 2020-2025 focuses on improving the quality of education in order to be competitive at the global level. Based on this strategic plan, the goal of vocational high school (VHS) education is preparing students or graduates to be ready to compete in the world of work and industry. The results of study conducted by [1] state that there is a gap between the qualifications required by the industry and the competences of VHS school graduates. Given the growing concern on graduate employability, there is a clear need for more empirical research to better understand and improve competency development in undergraduate business education. Such research will allow better assessment of how well-prepared business graduates are for entering junior level management positions as well as the identification the most critical skill gaps and the types of 'employability development opportunities' that can be developed or strengthened within the higher education institutions. The data in [2] show that the number of working people falls by 200 thousand people, which mainly occurs in the agricultural sectors while the number of unemployed people drops as many as 430 thousand people. Further, the labor force participation rate decreases by 1.44 percentage point whereas the un- employment rate decreases by 0.31 percentage point. In other words, in February 2016, the unemployment rate of Indonesia falls to 5.5 percent of the nation's labor force, which includes 7.02 million people compared to its rate in 2015 that is 5.81 percent. Meanwhile, in August 2016, the number of labor force of as many as 125.44 million people increases to as many as 3.06 million in August 2015.

One of the solutions to overcome the gap is performing a communication program between schools and industries. This program is intended to foster good relations between schools and industries, to obtain information from industries regarding the graduates' competency standards needed by the job market, and facilitate the students to perform a field work practice in industries that the schools have collaborated with. The research findings of [3] reveal that the efforts taken by vocational schools to produce graduates who have high competitiveness

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Corresponding author: Suranto Aw,
Universitas Negeri Yogyakarta, Yogyakarta, Indonesia
Email: suranto@uny.ac.id

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include increasing communication and collaboration between schools and the world of work or industry. Rationally, this communication program is very beneficial for both schools and industries. The argument stated by [4] shows that, given the education quality, attention to students' education as a main product that is expected from education quality system is of much greater demand in comparison to the past. The benefits of communication programs for vocational schools include getting information from the industries as a material for developing development, enabling students to perform competency tests carried out by assessors from industry, and obtaining competency certificates for students issued by industry. Meanwhile, the benefit for the industries is getting prospective skilled workers who have competencies they require. The same view is stated by [5] that information from industry is very much needed by schools for the consideration of policy making.

Ideally, each educational program needs to be evaluated to know whether the program runs based on the expected goals. With regard to this, it is important to develop an evaluation instrument for communication programs between schools and industries. This is due to the fact that the communication program between schools and industries is a very strategic program to establish cooperation, so that schools can develop curriculum and learning that produce graduates who have competitiveness and actual competencies which are relevant to the requirement of industries. Rationally, the availability of evaluation instruments will motivate school leaders to carry out evaluations.

Based on some literature [6], [7], the benefits of implementing evalutions in educational programs include producing a method for assessing whether or not the program is carried out in accordance with the goals, looking back on whether a program has been implemented based on the plan and has achieved the expected results, and using information obtained from the evaluation to take the right solution in making a decision.

The important role of evaluation for schools is stated by [8] in which schools must evaluate a program implementation thoroughly and continuously in order to improve its quality. Continuous evaluation requires an instrument that can be used to describe the success of communication programs between schools and industries. Therefore, it is necessary to develop a feasible evaluation instrument. Operationally, the problems in the present study include: (1) What are the constructs of evaluation instruments for communication programs between vocational schools and industries? and (2) How is the evaluation program between vocational schools and industries feasible viewed from: (a) the validity of the items based on the conformity between the theoretical constructs and the results of measurements in the field, and (b) instrument reliability?

2. Literature Review

Concept of Program Evaluation

A program evaluation is a series of activities intended to improve the quality, performance, and productivity of an institution in implementing a program. Through evaluation, information about the extent to which a program is implemented can be obtained; then this information is used to improve the program. According to [9], evaluation is part of the managerial process carried out to obtain information as a basis for making decisions. Evaluation is not a new concept in organizational lives because evaluation is embedded in the dynamics of organization. Furthermore, [10] states, "evaluation is not a new concept. In fact, people have been evaluating, or examining and judging things, since the beginning of human history".

Many programs are implemented to achieve certain goals. Whether the formulated objectives can be achieved or not and whether the program implementation faces obstacles or not require evaluation. By performing an evaluation, information regarding the achievement of the program objectives that have been formulated can be revealed. [11] explains various reasons why program evaluation should be implemented by stating that "There are many reasons for conducting program evaluations. Among these reason are: fulfilment of the accounting requirements of accounting for funds, answering requests for information, making administrative decisions, assisting staff in program development, and learning."

The study conducted by [12] shows that, to know the results of program implementation, one should not only examine the result itself but also gather information to determine whether the results of a program implementation are really generated from the implementation of the program, and not because of other factors outside the program. Furthermore [13] explains, "program evaluation is the process of systematically determining the quality of a program and how it can be improved".

Concept of Communication between Schools and Industries

The instruments developed in this study are intended to evaluate communication programs between schools and industries. Some literature has provided an explanation regarding the definition of communication program between schools and

industries. For example, [14] defines communication between schools and industries as an overall activity of delivering and receiving information intended to foster harmonious relations, management of issue, and cooperation. Communication programs are implemented to improve the quality of vocational school graduates that meet the needs of the job market and the development of competency-based human resources. Industry plays an important role in preparing skilled workers who have competitiveness by being actively involved in its process. Research findings of [15] show that they must yield benefits for the partners, but they are more than just the deal. They are living systems that evolve progressively in their possibilities. Beyond the immediate reasons they have for entering into a relationship, the connection offers the parties an option on the future, opening new doors and unforeseen opportunities. Research results [16] show that the main activities of communication programs between schools and industries include: (a) establishing a cooperation with partner industries, (b) involving industries in the development of curriculum and learning materials, (c) involving industries in the implementation of skills competency tests to evaluate the performance of students, (d) involving partner industries and professional associations to issue a certificate of competence for vocational school students.

3. Research Method

Type of study

The study is research and development, a research method used to develop certain products and test the effectiveness of the developed products. The product developed in this study is an evaluation instrument for communication programs between vocational schools and industries. The steps for developing the instrument refer to the procedure proposed by [17], which include: (1) formulating variable constructs based on theories about the concepts of the variables to be measured, (2) developing dimensions and indicators, (3) making instrument blue prints, (4) determining the quantity or parameters, (5) writing the items of the instrument, (6) performing the validation process, (7) revising, (8) conducting field trials.

Subjects of try-out

The subjects of the try-out or respondents involved in this study are 54 VHS teachers of Office Administration Competency Skills from SMK 1 Depok (Sleman Regency), SMK 1 Godean (Sleman Regency), SMK 1 Yogyakarta (Yogyakarta City), SMK 7 Yogyakarta (Yogyakarta City), and SMK 1 Bantul (Bantul Regency).

Data analysis techniques

The data analysis is aimed at obtaining evidence of construct validity and instrument reliability, by determining the conformity between theoretical constructs and the results of measurements in the field, analyzed by employing a factor analysis method using the SPSS20 software program for windows. The validity test is performed using the exploratory factor analysis (EFA). In addition, EFA is used to determine whether a construct can be explained by its indicators. The criteria used in this analysis refer the views of [18] stating that the indicators which can form constructs or variables are indicated by a high loading factor value (> 0.3) meaning that the measurement is in accordance with the data, and the Kaiser Meyer Olkin (KMO) value is > 0.5. To determine the reliability of the instrument, Cronbach's Alpha formula is employed at the minimum value of 0.7.

The instrument developed in this study is also tested for its feasibility based on the aspects of readability, effectiveness, and practicality. The criterion for the feasibility of the instrument from the aspects of readability, practicality, and effectiveness is a mean score of > 3.4 - 4.2 out of 5 or in the "appropriate" category. This refers to the conversion of quantitative to qualitative data on a scale of 5 using rules modified as in [19]. These rules are described in the following table.

Table 1. The Conversion of Quantitative to Qualitative Data

Formula	Mean Score	Category
$X > \mu X_i + 1{,}8 \times sb_i$	> 4.2	very appropriate/ very good
$\mu X_i + 0{,}6 \times sb_i < X \leq \mu X_i + 1{,}8 \times sb_i$	> 3.4 – 4.2	appropriate/ good
$\mu X_i - 0{,}6 \times sb_i < X \leq \mu X_i + 0{,}6 \times sb_i$	> 2.6 – 3.4	neutral/ average
$\mu X_i - 1{,}8 \times sb_i < X \leq \mu X_i + 0{,}6 \times sb_i$	> 1.8 – 2.6	slightly appropriate/poor
$X \leq \mu X_i - 1{,}8 \times sb_i$	≤ 1.8	absolutely inappropriate/ very poor

4. Results and Discussions

The development of the instrument in this study is started by performing a preliminary study which includes: conducting preliminary observations in various vocational schools to identify real problems in the field, carrying out literature reviews, doing regulation studies, and conducting studies on previous research results. This stage has two main objectives namely, to find and determine the components of the implementation of communication programs between schools and industries which

become the basis for the elaboration of the components into theoretical constructs and instrument indicators. Based on this preliminary study, components which are elaborated from communication programs between schools and industries consist of (1) communication to foster harmonious relations with industries, (2) communication to smooth the implementation of competency tests, and (3) coordinative communication in the implementation of industry work practices. After obtaining validation from the evaluation experts and the teachers, the three components are determined as references in the development of the instrument constructs.

In this study, the analysis of the instrument constructs is carried out using an exploratory factor analysis (EFA) using the SPSS 20.00 software for Windows. The EFA analysis is used to find out whether a construct can be explained by its indicators. Indicators which can form constructs or variables are indicated by a high loading factor value (> 0.3) meaning that the measurement is in accordance with the data and the Kaiser Meyer Olkin (KMO) value is > 0.5. In this study, the evaluation instrument for communication programs between schools and industries is elaborated into three constructs or variables which include: (1) communication to foster harmonious relations with industry, (2) communication to smooth the implementation of competency tests, and (3) coordinative communication of students' industrial practices. The results of the analysis of the three instrument constructs are presented as follows.

(1) The results of the instrument testing on the constuct of communication to foster harmonious relations with industry show the value of the Bartlett's test of sphericity 228.050 at a significance of 0.000. This result indicates that the construct has a significant correlation among indicators. In addition, KMO calculation result is 0.670, meaning that the sample has been adequate. In this construct, three factors or indicators are developed. After performing an analysis, the three factors have more than one Eigen value, therefore they have met the requirements as factors that can be developed. Based on the output of the rotated factor matrix, there are three factors of communication to foster harmonious relationships, namely factor 1: interpersonal communication on visits to industry, factor 2: sharing of information, and factor 3: routine meetings. Then, the distribution of the eight instrument items of communication to foster harmonious relations with the industry is presented. The results of the try-out on the eight instrument items indicate that they are included in factors 1, 2, and 3 with a total variance explained of 61.631%. This means that the three factors developed are able to measure communication variables to foster a harmonious relationship which reaches 61.631%. The factor load for all the item numbers of the communication to foster harmonious relations is above 0.3 meaning that all items are in the valid category. In addition, the reliability of the instrument is $\alpha = 0.818$ (greater than 0.7) so that the instrument is reliable.

(2) The results of the instrument testing on the constucts of communication to smooth implementation of competency tests indicate the value of the Bartlett's test of sphericity of 937.417 at a significance level of 0.000. This result indicates that there is a significant correlation among indicators, and the KMO calculation results reach 0.689 (greater than 0, 5) so that the adequacy of the sample is fulfilled. Based on the distribution of items, there are 14 instrument items of communication to smooth implementation of competency tests included in factors 1, 2, 3, and 4 reaching a total variant explained of 56.970%. The four factors consist of: (1) the socialization of the implementation of the competency test, (2) the preparation of competency test questions, (3) feedback (information on student competency achievement), and (4) industry recognition of student competencies. This shows that the four factors developed are able to measure the variables of communication to smooth the implementation of the competency test which reached 56.970%. Furthermore, all items have validity values of > 0.3 and meet the criteria of Kaiser-Meyer-Olkin measure of sampling adequacy indicated by 0.689 (> 0.5). In addition, the reliability is $\alpha = 0.885$ (> 0.7).

(3) The instrument of coordinative communication in implementing industry work practices include three factors or indicators, namely: coordination of arranging schedules for industry work practices, coordination of student's working room, and coordination of working equipment completeness. The results show that the Bartlett's test of sphericity is 665.608 at a significance of 0.000 which means that the variable of the coordinative communication in implementing industry work practices has significant correlation among the indicators, and the KMO calculation result is 0.810 (> 0.5) so that the sample has met the sufficiency criteria. Based on the distribution of items, there are 6 items of statements or questions for coordinative communication in implementing industry work practices, included in factors 1, 2, and 3 with a total explained variance of 67.217%. This shows that the three factors developed are able to measure the

variables of coordinative communication for the implementation of industry work practices at 67.217%. Furthermore, it can be seen that all items have validity values > 0.3 and meet the criteria of Kaiser-Meyer-Olkin measure of sampling adequacy indicated by 0.810 (> 0.5). In addition, the reliability is $\alpha = 0.869$ (> 0.7).

Based on the analysis of the three constructs or variables, a recapitulation table can be presented as follows.

Table 2. Recapitulation of Analysis Results on Evaluation Instrument of Communication Programs between Vocational Schools and industries

No	Constructs/Variables	Factors/Indicators	Number of items
1	Communication to foster harmonious relations with industry	1) Interpersonal communication on visits to industry	1-3
		2) Sharing of Information	4-5
		3) Routine meetings	6-8
2	Communication to smooth the implementation of the student's communication competency tests	1) The socialization of the implementation of competency test	9-11
		2) The preparation of the competency test questions	12-15
		3) Providing feedback (information on student competency achievement)	16-19
		4) Industry recognition of student competencies	20-23
3	Coordinative communication for the implementation of industry work practices	1) Coordination of managing schedule for industry work practices,	24-25
		2) Coordination of student's working room,	26-27
		3) Coordination of working equipment completeness.	28-29

The instrument feasibility is determined by the aspects of readability, effectiveness, and practicality. In determining the feasibility of the instrument, the researcher utilizes a multilevel scale score with a maximum score of 5. The detail results of the assessment on the feasibility of the instrument are presented below.

Table 3. Instrument feasibility viewed from the aspects of readability, effectiveness, and practicality

No	Evaluation Aspects	Mean Score
1	Readability	3.96
2	Effectiveness	3.89
3	Practicality	3.85
	Mean	3.9

Based on the rules of converting quantitative to qualitative data, the mean score of the instrument feasibility for the variable of communication programs between schools and industries is 3.9 out of 5, within the mean score range of > 3.4 - 4.2 meaning that the feasibility of the instrument falls into the ”appropriate” category. In summary, viewed from the level of readability, effectiveness, and practicality, the instrument developed in this study can be classified as feasible to use.

The results of the quantitative test using EFA show that the developed items are valid and the instruments are reliable. In addition, the evaluation instrument of communication programs between vocational schools and industries is an evaluation instrument model that is eligible or feasible for evaluating the implementation of communication programs between vocational schools and industries because the model is statistically supported by field data, both in terms of its structural model and measurement model.

Communication and collaboration of schools with industries/ professional associations/ partner institutions are intended to obtain information from the industry regarding the working competency standards needed by the labor market. The findings of this study reveal that one of the success keys on the development of student's competencies is the existence of teachers, learning, and curricula compiled by schools together with industries. Based on these competency standards, the school develops a relevant curriculum. Furthermore, the curriculum is implemented in the learning process. To find out the success of learning, industrial work practices and competency tests are carried out. Industry work practices function as a practical learning process for students in the real world of work i.e. industries and companies. The skill competency test is then carried out by inviting external examiners from the industry. The results of this external competency test are in the form of values. The value obtained by each student provides information about the achievement of competencies. If students are declared competent, a

certificate of competence is given as a formal recognition from the industry.

The instrument developed in this study involves teachers as respondents. Moreover, the evaluation process has not involved independent appraisals from outside the school, for example, an evaluation performed by a company or industry leader. Because it only relies on an internal appraisal assessment, it may decrease the objectivity of the assessment results. This limitation is overcome by performing a crosscheck on the results of assessments between data sources, for instance, a cross-check between the teacher and the student assessment results.

5. Conclusion

Based on the results of the study and the discussions, four items of conclusion can be drawn as follows. First, the evaluation instruments of communication programs between vocational schools and industries include 3 constructs, 10 factors or indicators, and 29 items. Second, the results of the instrument analysis at the implementation stage show that all items have validity and meet the criteria of KMO and the reliability coefficient. Third, the instrument developed in this study meets the requirements for validity and reliability so that it is feasible to be used by school leaders to evaluate the implementation of communication programs between vocational schools and industries. Fourth, the scope of the assessment objects in this instrument has not yet reached the outcome component, namely the performance of graduates as holders of competency certificates in the world of work.

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