THE COMPETENCY-BASED TRAINING MODEL FOR VOCATIONAL HIGH SCHOOL TEACHERS FROM ELECTRICAL EXPERTISE PROGRAMS

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Abstract

The study was to generate a valid, practical and effective competence-based training model for the electricity program vocational high school teachers. The type of the study was research and development that referred to the development stages proposed by Plomp. The data gathering instrument for the study consisted of: (1) validation sheet; (2) observation sheet; and (3) response questionnaire for the training participants and the trainers. In order to measure the level of reliability and the level of agreement consistency among the raters, the researcher implemented the Cohen's Kappa coefficient statistics has a minimum value of ≥ 0.70. The subjects of the study were the electricity program vocational high school teachers in the City of Makassar and the Regency of Gowa totaling 22 people. The results of the study were as follows: (1) the training model had fulfilled the criteria of validity so that the model might be implemented for the training activities of electricity program vocational high school teachers; (2) the training model had fulfilled the criteria of practicality that were measured from the level of model stage (syntax) implementation; (3) the training model had fulfilled the criteria of effectiveness that had the following indicators: (a) the level of knowledge and understanding exposed by the training participants, (b) the level of teaching skills exposed by the training participants, (c) the quality of training participants' portfolio and (d) the response of the training participants and the trainers.

Keywords: *training model, vocational high school teachers, competence*

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INTRODUCTION

Education is a long term investment for the human beings that has strategic values for the sustainability of civilization in the world. Indonesia has placed as the main and the most important aspect through the Law Number 20 Year 2003 (Presiden Republik Indonesia, 2003) regarding the National Education System, the verse 1 of the Law states that Education refers to the conscious and the well-planned efforts of manifesting learning situation and learning process in order that the learning participants might actively develop their self-potentials in order to attain the religious spiritual power, the self-control, the personality, the intelligence, the nobility and the other skills that will be necessary for themselves, the community, the nation and the state. The provision of well-qualified education is heavily determined by the well-qualified teachers.

Teachers have great and strategic role in developing human resources. Teachers are in the front line of educational implementation. Therefore, the teachers should have multiple competencies in relation to their tasks and responsibilities.

The Law Number 14 Year 2005 (Presiden Republik Indonesia, 2005) regarding the Teachers and Lecturers has positioned the teachers as the professional teachers and the learning agents altogether in the same time. In performing the tasks of professionalism, the teachers should have the following competences: learning plan, well-qualified learning implementation and learning results assessment and evaluation.

The development of teacher professionalism should be conducted continuously through the training programs. A professional teacher is a teacher who has the four integrated main competences namely: pedagogic competence, personality competence, social competence and professionalism competence (Presiden Republik Indonesia, 2005).

Pedagogic Competence refers to a teacher's capacity in managing the learning process. Personality Competence refers to a teacher's capacity in managing himself or herself. Social Competence refers to a teacher's capacity in serving as the part of a community. Professional Competence refers to the competences that have been attained through the professional education and the capacity of a teacher in mastering the science, technology and/or art and culture that he or she has been teaching. she will teach.

The position of a teacher is a position of profession. Rusman (2011, p. 16) states that profession is a position or employment that demands certain skills. The statement implies that the professional position might not be conducted or be held by the untrained people or the unskilled people. Instead, the professional position should be held by people who have gone through a process of training and education specifically for the domain that he or she will hold.

Pugach (2006, p. 8) states that a professional teacher is a teacher who has been able to improve his or her teaching quality in order to help the learning participants to develop their self-potentials.

Finch & Crunkilton (1999, p. 258) states that a competeny for vocational and technical education are those tasks, skills, attitudes, values and appreciations that are deemed critical to success, life and/or in earning a living.

Competence in the context of vocational education refers to the mastery of tasks, skills, attitudes and appreciations that have been necessary for supporting the success. The statement shows that comptence includes tasks, skills, attitudes and appreciations that should be possessed by the learning participants in order to perform their learning tasks according to certain jobs.

Multiple problems related to the low quality of the graduates and the low level of graduates absorbance in the employment, especially among the vocational high school graduates, is not apart from the teachers' capacity in managing the learning process. Based on the results of a study by Soenarto (2014, p. 2), not all teachers have been teaching competently, not all teachers have been provided with the programs of competence improvement and the learning process within the classroom has still been classical in which the students are provided with the outdated competences whereas the real world keeps changing.

The teacher competence test (*Uji Kompetensi Guru*, UKG) in 2015 tested the teacher competence in two domains namely the pedagogic domain and the professional domain. The national average score for the UKG 2015 in the two domains of competence had been 53.02. The General Director of Teachers and

Educational Staffs (*Guru dan Tenaga Kependidikan*, GTK) from the Ministry of Education and Culture stated that the national average score for the results of UKG for the pedagogic domain of competence had 48.94 and the average had been under the minimum competnece standards (*Standar Kompetensi Minimum*, SKM) which had been 55.00. In other words, nationally the teachers' pedagogic domain of competnece had been less good and there should be efforts for improving the pedagogic domain.

Based on the data of teacher quality that has been explained above, there should be comprehensive efforts for improving the teachers' competence especially for the vocational high school teachers in electricity domain. One of the solutions for improving the vocational teachers' professionalism is designing training and education programs (*Pelatihan dan Pendidikan*, Diklat). The professional teachers are required to have the academic qualifications that should be relevant to the subjects that they have been teaching and to master the competences as having been required by the Law of Teachers and Lecturers (Presiden Republik Indonesia, 2005).

According to Ndraha (1999, p. 128), training has been a process of professionalism establishment regarding a job in the human. The Competence-Based Training (CBT) is a training program that pays attention to the necesary knowledge, skills and attitudes in the working environment so that the workers might perform their jobs competently. So, the competence-based teacher training program is a training program that will be provided in accordance with the competences that the teachers demand in performing their tasks as a professional educator.

The competence-based electricity program vocational high school teachers training model is to improve the pedagogic competence and the professional competence in the electricity program so that the vocational high school teachers might plan, implement and evaluate the science-based learning process in the electricity program effectively. The competence-based electricity program vocational high school teachers conceptual training model will be presented in Figure 1.
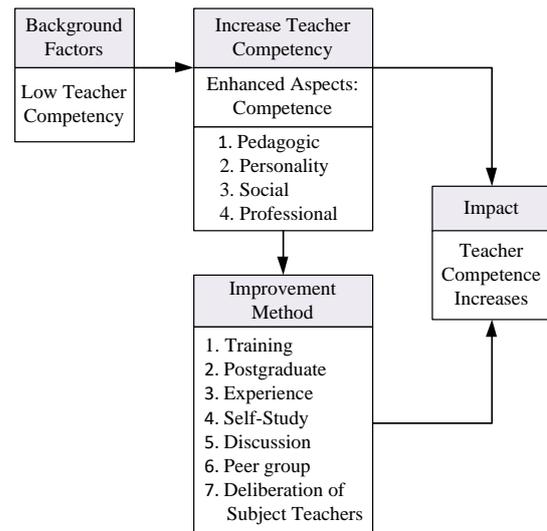

Figure 1. The Competence-Based Electricity Program Vocational High School Teachers Conceptual Training Model

Based on the preliminary survey that the researcher conducted regarding the competences of electricity program vocational high school teachers in several vocational high schools within the City of Makassar, the Province of South Sulawesi, especially in terms of pedagogic competence and professional competence, the researcher found several matters namely: (1) the teachers' capacity in developing the lesson plans based on the syllabus had been low; (2) the teachers' capacity in conducting the learning process and in managing the classrooms had not been maximum; (3) the teachers' capacity in developing the learning materials based on the core competence and the basic competence (*Kompetensi Inti*, KI, and *Kompetensi Dasar*, KD) had been low; (4) the teachers' teaching strategy had been less various; and (5) the teachers' capacity in designing the assessment rubric had still been low.

In addition to the teachers' competences that had been observed, the researcher also observed the types of vocational high school teacher training program that had been provided by the Government. From the results of the observation, the researcher found that the training programs that the electricity program vocational high school teachers used to attend were the industrial internship and the training and education of teacher profession during the certification. On the other hand, there had not been any competence-based electricity program vocational high school teacher training

programs that had been intended to improve the teacher professionalism continuously; as a result, there should be a specific model for the continuous training efforts toward the electricity program vocational high school teachers.

Several empirical findings that have been mentioned above show that the electricity program teachers have not been able to show sufficient performance and have not fully been supported by the sufficient degree of competence mastery. In addition, there has not been any competence-based electricity program vocational high school teachers training model that becomes the human resources development plan in the schools and that is provided by the Office of Education the City of Makassar through the continous training efforts.

In relation to the situation, the American Vocational Association (Thompson, 1973, p. 111) states that "Vocational education as education designed to develop skills, abilities, understandings, attitudes, work habits and appreciation needed by works to enter and make progress in employment on useful and productive basis".

From the above definition, the researcher might infer that the vocational educational has basically been designed to develop the skills, the capacity, the understanding, the attitudes, the job habits and the knowledge for the workers in order to meet and to develop as well as to improve their working skills so that they will be totally useful and productive workers. Similarly, the United States Congress (Djojonegoro, 1998, p. 34) defines the vocational education as an educational program that is directly related to the preparation of an individual in entering certain employment or the additional preparation of an individual's career.

According to Prosser, several principles in the vocational education support the importance of vocational high school teacher competence improvement continously and these principles are as follows: (a) the vocational education will be effective if the teachers have been successful in implementing the skills and the knowledge on the process and the operation of the job that will be performed; and (b) the effective vocational education might only be implemented within a situation in which the training tasks are conducted by using the manners, the tools and the machines that the actual employment operate.

Susatya (2013) in his study has concluded that the development of art and culture program vocational high school teachers training model has been effective in improving the quality of competence mastery, the quality of artwork and the productiveness of training and education participants. On the other hand, a study by Fakhra & Mahar (2014) has shown that the teachers who attend the training programs have better competneces in comparison to those who do not attend the training programs.

Based on the multiple problems that have been explained above, the researcher deems the urgency to develop a training model for the competence-based electricity program vocational high school teachers.

The training model the researcher would like to focus on the improvement of the pedagogic competence and the professional competence among the electricity program vocational high school teachers.

The objectives of the study are as follows: (1) to develop the competence-based electricity program vocational high school teacers training model; (2) to generate the valid, practical and effective competence-based electricity program vocational high school teachers training model; and (3) to generate the competence-based electricity program vocational high school teachers training model that will be responded positively by the training and education participants.

The specifications of the product that will be generated are as follows: (a) the Manual of Competence-Based Electricity Program Vocational High School Teachers Training Model Implementation; (b) the training materials in the form of Tutorial Compact Disc (CD); and (c) the set of evaluation (learning evaluation, product evaluation and response evaluation). On the other hand, the research instruments that will be developed are as follows: (a) the instrument of model assessment; (b) the instrument of trainer activities in the learning process; (c) the questionnaire of trainer response; (d) the questionnaire of participant response; (e) the instrument of learning syntax implementation; and (f) the rubric of teacher performance scoring results

The ADDIE (Analysis, Design, Development, Implementation and Evaluation) Training Model (Noe, 2008, p. 6) has been one of the training models that consists of five stages according to the name namely: (1) perf-

orming the needs analysis; (2) creating the training program design; (3) performing the training material development; (4) performing the training material implementation; and (5) performing the training program evaluation .

The researcher adapts the ADDIE Training Model by simplifying the five stages into the three stages as follows: (a) the planning stage that includes the needs analysis, the training objective formulation and the training program design; (b) the training implementation stage that includes the learning activities (the opening, the core and the closing activities) and the tutorial; and (c) the evaluation stage that includes the reaction (response) evaluation, the learning evaluation and the product evaluation. The hypothetical model of competence-based electricity program vocational high school teachers training model is presented in the following Figure 2.
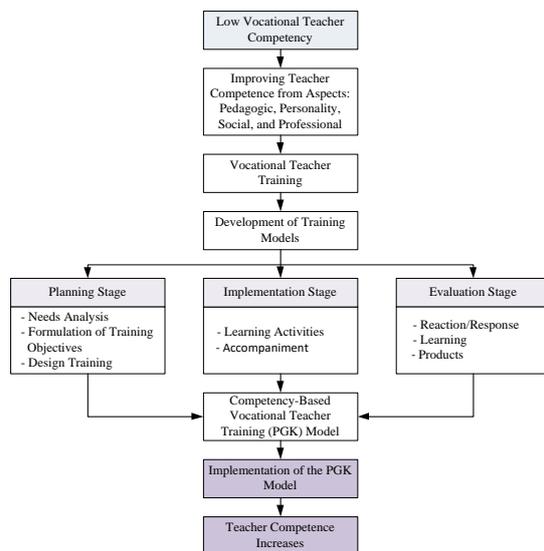

Figure 2. The Hypothetical Model of Competence-Based Electricity Program Vocational High School Teachers Training Model

RESEARCH METHOD

The type of the study was Research and Development. The main activity within the study was developing a competence-based electricity program vocational high school teachers training model in order to improve the vocational high school teachers' professionalism in the electricity programs.

The development of the competence-based electricity program vocational high school teachers training model followed the

model development stages proposed by Plomp (1997, p. 5), were as follows: (1) preliminary investigation; (2) design; (3) realization/construction; (4) test, evaluation and revision; and (5) implementation. On the other hand, for the instructional or the learning development the researcher implemented the SCID (Systematic Curriculum Instructional Development) approach proposed by Norton (2008, p. 6).

The subjects in the study were the electricity program vocational high school teachers in the state and the private vocational high schools located in the City of Makassar and the Regency of Gowa that had the electricity engineering expertise study program.

The data analysis technique that the researcher implemented in the study was the descriptive qualitative. In addition, the data that had been gathered by means of research instruments would be analyzed qualitatively and quantitatively.

For the instrument analysis, the aspects that had been assessed in general consisted of manual, content, language and layout with the score ranging from 1 until 4. The validity category of each aspect or of overall aspect that had been assessed would be defined based on the categorization criteria that the researcher adopted from Azwar (2013, p. 163) as follows:

Table 1.   The Criteria of Component Assessment

Score Range	Categories
$(M + 1,5s) < X$	Very Valid
$(M + 0,5s) < X \leq (M + 1,5s)$	Valid
$(M - 0,5s) < X \leq (M + 0,5s)$	Less Valid
$X \leq (M - 0,5s)$	Not Valid

Note:
X = The score that had been achieved
M = The mean score
s = The standard deviation

The criterion that the researcher implemented in order to define whether the instrument that the researcher implemented had already displayed the sufficient degree of validity or not was if the mean (M) of the assessment results for the overall aspects had displayed the minimum score then the instrument would be in the "valid" category.

Then, in order to measure the inter-rater reliability toward the research instrument assessment/validation results provided by the ex-

perts the researcher analyzed the results by means of Coefficient of Cohen's Kappa and of Percentage of Agreement proposed by Nitko & Brookhart (2007, p. 80). The assessment sheet would be considered reliable if its coefficient of reliability (r) ≥ 0.70.

Next, a model would be considered practical if the vocational education material experts and the vocational education experts as the field practitioners stated that: (1) the model might be implemented with little revision at minimum; and (2) the model might actually be implemented for all aspects under observation and at least the model displayed the "partly implemented" category.

Last but not the least, a model would be considered effective of the model met the following criteria of effectiveness: (1) the trainer had the capacity to manage the learning process with "good: category at minimum; (2) the learning results might be measured from the results of post-test assessment given at the end of the training model and the results should belong to the "good" category at minimum in comparison to the pretest results; and (3) the trainer's and the training participants' response toward the model implementation should be "positive" at minimum and the trainer objectively stated that the might be implemented for improving the competences of the electricy program vocational high schools.

RESEARCH RESULTS AND DISCUSSION

An effective training should be a training that had been able to achieve the objectives that had been formulated. In relation to the statement, the competence-based electricity program vocational high school teachers training modelwas to improve the teachers' competence in terms of planning the learning process, of implementing the well-qualified learning process and of assessing and evaluating the learning results. The Competence-Based Electricity Program Vocational High School Teachers Final Training Model would be displayed in Figure 3.
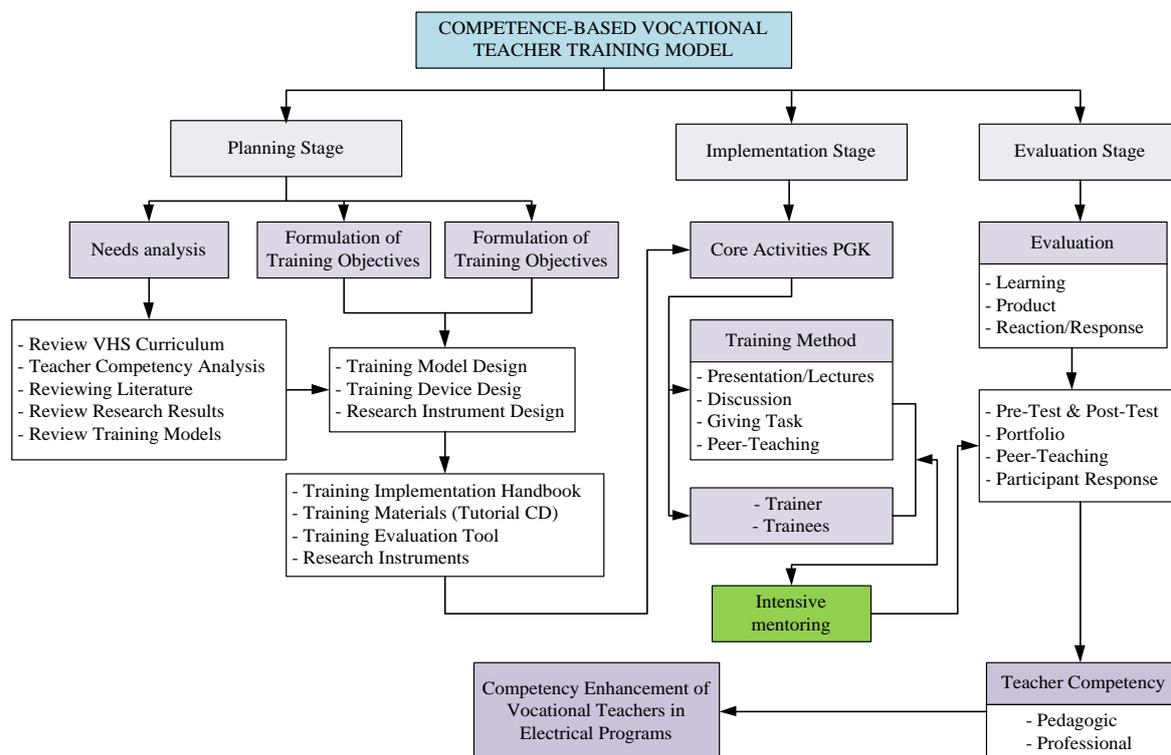

Figure 3. The Competence-Based Electricity Program Vocational High School Teachers Final Model

The Planning Stage

The planning stage was begun by the needs analysis through a review toward the electricity program vocational high schools curriculum based on the spectrum and the structure of 2013 Curriculum for the Vocational High Schools, namely the Installation Engineering of the Electric Power Use, the competences of electricity program vocational high school teachers. The planning stage was based on the preliminary data regarding the low pedagogic and professional competence of the electricity program vocational high school teachers.

Then, the researcher distributed a questionnaire in order to gather the data regarding the competences that the teachers demandedin developing their competences. Based on the results of data analysis, the indicators of competence achievement that the researcher would develop would be the ones for the pedagogic competence and the ones for the professional competence.

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In addition to distributing the questionnaire for determining the competence that should be developed, the researcher also distributed the questionnaire regarding the importance of developing the training sets and the second questionnaire was related to the following indicators: (a) developing the lesson plans; (b) developing the learning materials; and (c) developing the set of assessment for the learning results. The mean score of the questionnaire would be displayed in Table 2.

Table 2. The Score of Training Set Development

No	Aspects under Assessment	Score (%)
1	Lesson Plan Development	88.31
2	Teaching Materials Development	98.18
3	Learning Results Assessment Development	86.36
	Average Score of Assessment	90.90

Based on the results displayed in Table 2, the researcher found that the mean score had been equal to 90.90% from the components that the respondents assessed. As a result, the researcher might conclude that the competences that the researcher developed in the vocational high school teachers (*Pelatihan Guru Kejuruan*, PGK) training model would be the pedagogic competence and the professional competence.

Then, based on the results of analysis toward the competence needs and the training needs that became the basis of instructional development, the researcher formulated the training objectives operationally. The training design consisted of: (a) the training model design; (b) the training sets design; and (c) the research instrument design.

The prototype of competence-based electricity program vocational high school teachers or also known as the PGK (*Pelatihan Guru Kejuruan*, PGK) training model was designed in the form of the PGK manual complete with the PGk training sets (training materials and evaluation sets). On the other hand, the research instrument included: (a) the instrument of trainer's response toward the model implementation; (b) the instrument of participants' response toward the trainer's activities in the learning process; and (c) the instrument of observation toward the model implementation within the classroom.

Table 3. The Results of Research Instrument Feasibility

No	Name of the Instrument	Frequency of (LD) (LDR)
1	PGK Model Assessment Sheet	(1)(3)
2	Training Materials Assessment Sheet	(1)(3)
3	Scoring Rubrics Assessment Sheet	(1)(3)
4	Training Participants' Response Questionnaires	(1)(3)
5	Observation Sheet of Trainer's Activities in the Learning Activities	(0)(4)
6	Model Implementation Assessment Sheet	(0)(4)

Before having been implemented, all of the instruments were assessed in terms of feasibility by the educational experts. The feasibility assessment for each instrument was re-

viewed based on 3 (three) aspects namely: manual, coverage (content) and language. Then, the results of instrument feasibility assessment would be displayed in Table 3.

Before performing the empirical experiment toward the prototype of PGK model and the supporting instrument, the researcher first performed the conceptual validation test with the educational experts/validator.

Based on the criteria of component assessment in Table 1 and the coefficient of reliability (r) ≥ 0.70, from the results in Table 4 the researcher might conclue that all of the assessed instruments had been in the valid and reliable category and might be implemented as the components of competence-based electricity program vocational high school teachers training model.

Based on the results, the researcher might state that all of the instruments had been feasibile for implementation although there were some instruments that should be revised. In general, the researcher would like to conclude that all of the instruments had been feasible for filtering the data on the validity, the practicality and the effectiveness of the competence-based electricity program vocational high school teachers (PGK) model.

The Implementation Stage

The implementation stage was begun with the preliminary activities that provided aperception, motivation and explanation regarding the objectives of the training and the matters that were related to the training implementation as having been written in the manual. Before proceeding to the main activities, the training participants were provided with the pre-test in order to measure the level of their pedagogic competence and of the professional competence before the researcher implemented the training program.

The main activities were the learning material provision. included the theoretical materials, the practical materials and the assignment in terms of portfolio. The training methods that the researcher employed were presentation, discussion, peer-teaching and portfolio. During the training the trainer or the source performed an intensive guidance in order to ease the achievement of training objectives. So, the guidance was adjusted to the condition and the situation that the training participants encountered.

Table 4. The Summary on the Results of Research Instrument

No	Name of the Instrument	Mean Score (M)	Coefficient of Cohen's Kappa (r)
1	Manual Assessment Sheet	3.80	0.806
2	Training Materials Assessment Sheet	3.70	0.799
3	Assessment Sheet of Teacher Performance Rubrics Score	3.70	0.797
4	Training Participants' Response Assessment Sheet	3.60	0.860
5	Trainer's Activities Observation Sheet	3.70	0.833
6	Model Implementation Observation Sheet	3.70	0.848

The concluding activities were the end of the training program implementation in which the trainer provided reflection during the training program implementation, discussed the learning experiences, provided the conclusions, delivered the message and provided the motivation. Before the training program had been ended, the training participants were provided with the post-test in order to measure their understanding and capacity or competence after attending the training program, attending the peer-teaching activities, attending the independent tasks in the form of portfolio and completing the questionnaire of participants' response.

The Evaluation Stage

In this stage, the researcher performed an evaluation in order to measure the effectiveness of PGK Model that had been developed. In conducting the evaluation, the researcher referred to the four-step evaluation that had been developed by Kirkpatrick, or also known as four levels of evaluation (Phillips, 1991, p. 41), and the four levels of evaluation consisted of reaction evaluation, learning evaluation, behavioral evaluation and results evaluation. Within the study, the researcher only conducted three levels of evaluation namely the reaction evaluation, the learning evaluation and the results evaluation.

The reaction evaluation was to identify the level of reaction/response or of opinion, argumentation and comment that the training

participants provided toward the quality of PGK model implementation after attending the training program. In order to identify the leve of training participants' satisfaction, the researcher measured several aspects within the training program. The aspects included: the achievement of training objectives, the strategy and the method that had been implemented in the training program, the training sets, the supporting facility and the evaluation that had been implemented. The instrument that the researcher applied was the response questionnaire in order to identify the respondents' response toward the training provision. The recapitulation on the results of training participants' response analysis might be seen in Table 5.

Table 5. The Assessment of Training Participants' Response

No	Categorization	Frequency	Percentage
1	Very Good	22	100.00
2	Good	0	0.00
3	Poor	0	0.00
4	Very Worse	0	0.00
	Total	22	100.00
	Mean Score	3.82	

Based on the criteria of component assessment in Table 5, the researcher found that the training participants' response belonged to the very good criteria. In general, the researcher might conclude that the training participants provided response, argumentation and comment toward the PGK model implementation in a very positive manner.

The learning evaluation was conducted in order to identify how far the training participants had been able to absorb the knowledge, the skills and the attitudes that had been trained. The learning evaluation in the training program was conducted by comparing the knowledge and the understanding of the training participants before and after attending the training program (pre-test and post-test). The recapitulation on the pre-test and post-test results might be seen in the Figure 4 as follows.

The results in Figure 4 showed that in general the results of training participants' pre-test and post-test had significant improvement. In terms of mean score, the pre-test score was 2.40 and the post-test score was 3.01. The significant improvement showed that within

the training process there had been significant improvement toward the knowledge and the understanding of the training participants.
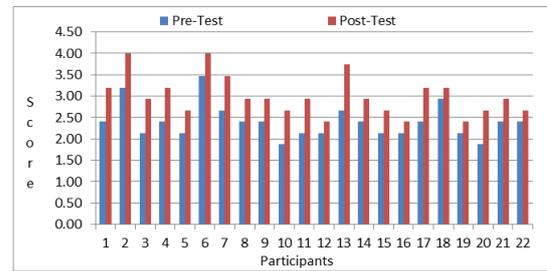

Figure 4. The Historiogram of Training Participants Pre-Test and Post-Test Assesment

In order to view whether there had been differences between the pre-test and the post-test results or not, the researcher performed a non-parametric statistical test in the form of Wilcoxon Test. Score of Asymp. Sig. (0.000) < α (0.050). Therefore, the researcher might conclude that there had been significant difference between the pre-test and the post-test. In other words, there had been improvement on the training participants' knowledge and skills before and after the training provision.

The result/product evaluation might be seen from the training participants' success in designing the products or in the form of independent task (portfolio) consisting of lesson plans and peer teaching activities. The assessment toward the peer-teaching activities were implemented at the end of the final meeting by presenting the tasks that had been given previously. On the other hand, the assessment toward the learning plan was conducted in the form of independent task (portfolio) consisting of lesson plans. The recapitulation on the results from both assessments might be seen in Figure 5 as follows.

Figure 5 showed that in general the results of portfolio and the peer-teaching activities conducted by the training participants had belonged to the good category. The mean score of learning plan (portfolio) had been equal to 3.49, while the mean score of learning implementation had been equal to 3.41. The mean score comparison showed that the teaching level and the portfolio quality in the development of training participants' learing sets had belonged to the good category.
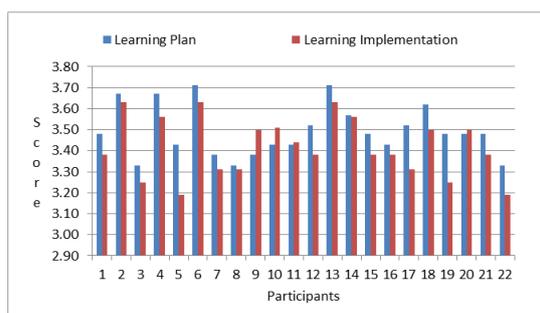
Figure 5. The Historiogram of the Assessment toward the Learning Plan and the Learning Implementation

In order to view whether there had been difference on the assessment results between the learning plan and the learning implementation or not, the researcher performed the non-parametric statistical test in the form of Mann-Whitney Test. Score Asymp. Sig. (0.000) < α (0.050). As a result, the researcher might state that there had been significant difference between the score of learning plan and that of learning implementation.

Based on the results of data analysis toward the model effectiveness (the pre-test score, the post-test score, the portfolio, the peer-teaching activities and the training participants' response), in general the researcher would like to conclude that the vocational high school teachers training model (the PGK model) had been very effective for implementation in order to increase the competences of the electricity program vocational high school teachers.

The assessment toward the PGK model practicality was measured in terms of model implementation level namely the implementation of all training activities in accordance with the learning syntaxes or stages that had been designed. The assessment toward the learning model would be displayed in Table 6.

Table 6. The Results of Observation toward the Model Implementation

Meeting	Observation (%)	PA (%)
1	96.15	92.31
2	92.31	100.00
3	96.15	92.31
4	96.15	92.31
5	100.00	100.00
Mean Score of Assessment	96.15	95.38

The results in Table 6 displayed the results of analysis toward the PGK model implementation within the classroom and the results showed that the mean score of observation had been equal to 96.15% (very good). On the other hand, the results of analysis toward the inter-rater agreement (Percentage of Agreements, PA) within the observation of trainer's activities showed that the average score of PA assessment had been equal to 95.38% (very good).

The results of data analysis showed that both observers had similar perception in observing the trainer's activities within the implementation of learning stages in the classroom. Similarly, the trainer within the experiment displayed high responsibility in implementing the learning stages within the classroom and the display of high responsibility within the implementation of learning stages belonged to the good category.

Based on the results of data analysis in the assessment toward the model implementation, the researcher might conclude that the PGK model had been very practical for the implementation as a training model in order to improve the competences of the electricity program vocational high school teachers.

CONCLUSIONS

Based on the results and the discussions above, the researcher would like to draw the following conclusions:

First, based on the results of validity analysis, the researchers has found that all of the validators state that the vocational high school teachers training model along with the training sets have met the validity criteria and, as a result, the training model might be implemented as the electricity program vocational high school teachers training model.

Second, the results of practicality have been measured in terms of model stage implementation that in overall has met the very good criteria with the mean score that has been equal to 96.15%. As a result, the researcher might conclude that the resulted electricity program vocational high school teachers training model has met the very practical crtieria and might be implemented as the training model for improving the competences of electricity program vocational high school teachers.

Third, the vocational high school teachers training model has met the effective criteria with the following indicators: (a) the level of training participants' knowledge and understanding regarding the training materials has belonged to the high category based on the pre-test and the post-test results; (b) the level of training participants' teaching skills has belonged to the good category based on the peer-teaching activities; (c) the quality of portfolio resulted from the development of learning sets has belonged to the good category; and (d) the training participants' response has been very positive based on the results of the questionnaires that the training participants have completed.

From the achievement of the four effectiveness indicators, the researcher would like to conclude that the vocational high school teachers model that has been developed is effective for improving the competences of electricity program vocational high school teachers.

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