

**Journal of Social Sciences (COES&RJ-JSS)**

**ISSN (E): 2305-9249 ISSN (P): 2305-9494**

**Publisher: Centre of Excellence for Scientific & Research Journalism, COES&RJ LLC**

**Online Publication Date: 1<sup>st</sup> July 2016**

**Online Issue: Volume 5, Number 3, July 2016**

<http://centreofexcellence.net/J/JSS/JSS%20Mainpage.htm>

**Competency mapping based education and training program  
development model at the centre of teachers and education staffs  
development and empowerment in Malang, East Java, Indonesia**

Jojon Suherman\*, Bambang Budi Wiyono\*\*, Kusmintardjo\*\*\*, Ali Imron\*\*\*\*

\*Center of Automotive and Electronic Teachers and education Staffs Development,  
Malang, East Java, Indonesia, [jojonshm@gmail.com](mailto:jojonshm@gmail.com)

\*\* Professor of Education Management, State University of Malang, Indonesia

\*\*\*Associate Professor of Education Management, State University of Malang,  
Indonesia

\*\*\*\*Professor of Education Management, State University of Malang, Indonesia

**Abstract:**

This research was aimed at developing model of competency based education and training program by using program instruments and software for education and training services. This research employed the Borg and Gall Research and Development Method simplified by the Center of Policy Research and Innovation of The Indonesia Republic Department of Education. The research was conducted by following 5 (five) steps including initial research, initial product development, experts validation, small scale field trial, large scale field trial and product implementation. The objects of this research were leaders, staffs, and teachers. This research resulted 5 (five) products including the concept of model, guidelines of using instruments to design program tools for each level, guidelines of using tools for competency eligibility, competency mapping software, and manual of using competency mapping software.

The product workability was measured through the product usage level, the ease of product usage level, the level of product readability, the level of product completeness, the level of product effectiveness, and the product attraction using five scales category. Results of this research showed that these initial 4 (four) levels categorized as very high scoring 4.81 at the validation phase, scoring 4.62 at the small scale trial phase, and scoring 4.63 the large scale trial phase, and 4.85 at the implementation phase. The product attraction level also reached very high scoring 4.86 and the satisfaction level in the implementation of the product was also very high scoring 4.60. The software was successfully used to input 4230 vocational teachers data base. This research concluded that the product can be used by the center of Center of Automotive and Electronic Teachers and education Staffs Development, Malang, East Java, Indonesia to (1) design graded and continuous education and training program, (2) design competency assessment instruments for the quality assurance, and (3) to conduct need analysis using competency mapping software.

**Keywords:**

Competency mapping, graded education and training, competency eligibility, competency software mapping.

**Citation:**

Suherman, Jojon; Wiyono, Bambang Budi; Kusmintardjo; Imron, Ali (2016); Competency mapping based education and training program development model at the centre of teachers and education staffs development and empowerment in Malang, East Java, Indonesia; Journal of Social Sciences (COES&RJ-JSS), Vol.5, No.3, pp: 252-262.

## **Introduction**

Center of teachers and education staffs development and empowerment is the place where teachers and education staffs develop their competency that can contribute to the quality of education in Indonesia. The quality of education developer can be seen from the *education development index* (EDI) in which in 2011 Indonesia places at the 69 position with 0.934 index level. The first position is Finlandia with 1.00 index level . This has been the main factor determining the success of education in Finlandia. This success has been contributed by the quality teacher recruitment and the good as well as structured education and training. Based on this fact, the center of teachers and education staffs development and empowerment in Malang needs program model to enhance teachers and education staffs competency.

Based on the preliminary research conducted by Jojon (2013), the preparation and execution of the education and training provided by the center of teacher and education staffs in Malang, it was found out that: (1) the education and training program was designed on the basis of the analitical ability of each individual center, instead of being designed on the basis of the National standard, (2) the education and training program was designed on the basis of the query needs, instead of being designed as the *continuing profesional development*(CPD) program, (3) the invitation to the participants was done on the basis of data hunting, instead of reliable data base connected to the continuous profesional development program data based, (4) the quality assurance was based on the education and training evaluation, instead of using realiable competency assessment integrated to the education and training program for continuous profesional development that makes the center unable to grant certificate of competency. In fact the Law of the Indonesia Republic National Education chapter 61 verse 3 revealed that competency certificate can be granted by education and training institution as the recognition of the competency after being assessed by the accredited institution.

Based on this factual phenomema, it was obvious that there were problems in designing education and training program, of ineffective and inefficient services, in lacking of having graded education and training structure, and in having no reliable information mangement data base. This affected the unclear education and training standard, education and training tools standard, education and training materials, and education and training media. These are very crucial to work with education and training budgets.

The Indonesian government has required the *continuing profesional development* (CPD)model of education and training as structured approach to help enhance trainee competency. Anwar (2003) said that teachers can be developed through the *continuing profesionaldevelopment* model at their own schools and at the center of profesional development such as the teachers work group, principals work group, and supervisors work group involving relevant learning activities in terms of formal learning, structured and informal learning, and self directed learning. In fact the center of teachers and staffs education and training only used non graded education and training program impacted to the lack of furthure education and training stages and need analysis as well as participants analysis was conducted every year ineffectively.

In general, these problems covered the weaknesses of the education and training need analysis techniques, the unavailability of the graded structured continuous education and training program, the unavailability of the quality assurance model, and the weaknesses of the data base system. This needed solutions and therefore, this research was conducted. This research has been expected to solve these problems in terms of the concept

modelling, instrumentations, and software. Furthermore, it is highly needed to provide education and training program products which had to be designed on the basis of the competency gap and conducted step-by-step as well as continuously. Reliable Education and training data base as well as management which are able to determine right and eligible participants are also highly needed.

Based on these argumentations, this research was conducted. The researcher developed Competency Mapping Based Education and Training Model aiming at: (1) developing graded competency mapping based education and training, (2) developing graded education and training tools design completed with usage manual books, (3) developing competency eligibility program tools design instruments completed with usage manual book, (4) developing competency mapping based education and training service software, and (5) developing competency mapping based software usage manual.

The supporting theories used in this research were including Pont's (1991) theories describing five phase of training, which are (1) training need analysis, (2) training approach design and planning, (3) training materials development, (4) training implementation and (5) Training evaluation; Nadler's (1982) theories known as *The Critical Events Model* (CEM) which was developed based on the reality that organization and individuals are complex, and Mathis dan Jackson's (2002) theory saying that relevant components of training phase include initial evaluation, implementation, and evaluation.

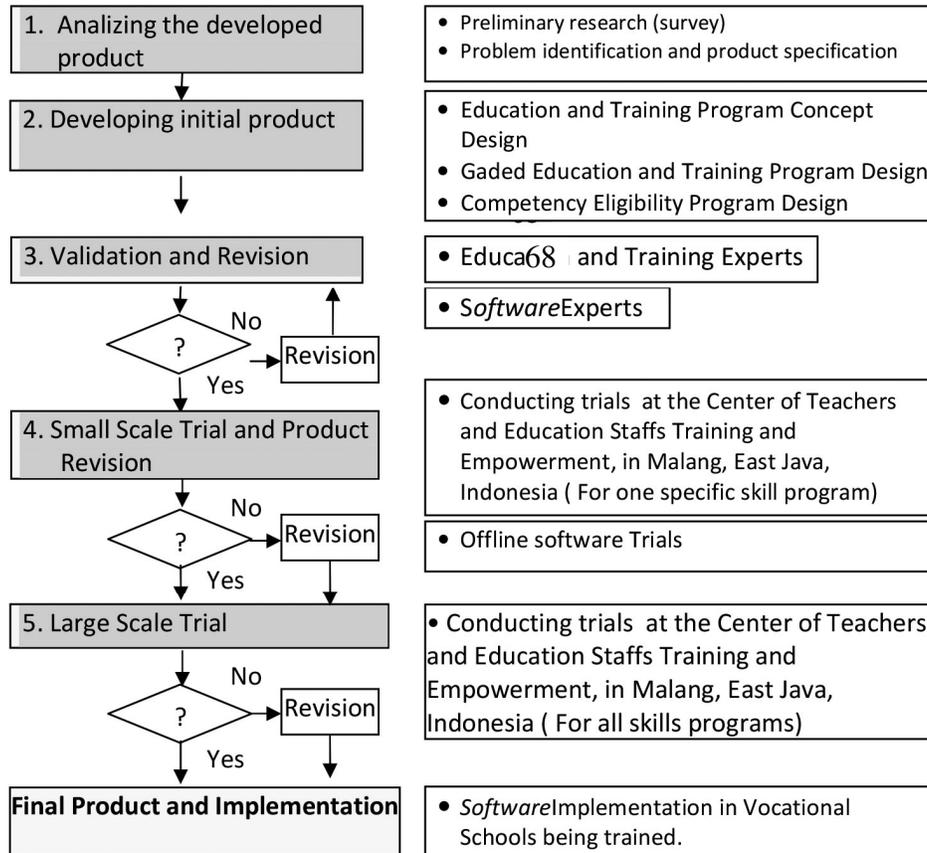
In the case of CEM, not all variables can be included in the training program design. Only certain important events are chosen in the system. Such events are nine steps including (1) organization need identification, (2) evaluation and feedback, (3) work formation specification, (4) learning need identification, (5) training objective determination, (6) curriculum design, (7) teaching strategy selection, (8) teaching resources provision, and (9) implementation of training. The evaluation phase is always related to the planning phase. The main target of the training are teachers who are weak at their competency. There are criteria of success which are designed on the basis of the competency gap. In the implementation phase the leaders of training as well as the specialists can collaborate with instructional provision, classes, materials, and those related to the training. The evaluation phase is very important to see to what extent the training is successful and to see whether the objectives are achieved. To work on this effectively each bundle of training need to be completed with instructional planning, module, presentation, and evaluation (Supriyono, 2016:40). Training supervision functions as the bridge between implementation and evaluation and become the feedback to determine training objectives in the future. Sugiri, in Sonhadji (2001) identify the components of training system model as (1) mission understanding, policy, and training organization objectives, (2) training plan, (3) training program design, (4) training implementation, (5) training method, (6) evaluation, and (7) monitoring and field work. Working with proper steps of teachers and education staffs professionalization as well as concerns on motivation are also important (Supriyono, 2015). These are important to be included in the development of training model.

### **Method**

This research employed *research and development* (R&D) on the basis of the Board dan Gall model of ten research steps which were modified and simplified by Depdikbud to be five steps procedures including (1) analyzing developed product, (2) developing initial

product, (3) validation and revision, (4) small scale trial and product revision, (5) large scale trial and product finalization (Depdikbud, Board dan Gall, 1983).

This research and development product is developed by the researcher himself; Therefore, this need to be exposed to show the components and relation among the componenets in the development (Depdikbud, 1983). Those five steps procedures can be visualized in the following pictures:



**Figure1 Research and Development Procedures Scheme**

**1. Developed Product analysis**

At this phase, the researcher conducted literary study to clearly define problems being researched and developed and to make main scope of research to avoid intentional and unintentional plagiatio. The researcher, then, conducted preliminary research at the Education and Training Institution which belongs to Directorate general of Teachers and Education Staffs, Indonesia Republic in 12 Centers of Teachers and Education staffs Development and Empowerment across Indonesia to collect data information on managerial problems and potential driving forces to develop the initial product. The initial product was Education and Training Management Model using “Competency Mapping Based Education and Training Model”.

The education and training program was developed by structuring the education and training themes which are graded on the basis of the competency standard framework. The participants were determined through competency mapping by comparing the real

participants competency and the competency standard. This resulted valid competency gaps as the training needs. Sumantri (2005) said that training needs were conditions where there were gaps between the expected situation and the real situation. To fulfill these objectives, the researcher conducted research and development concerning (1) Competency Mapping Based Education and Training Program comprising graded education and training program, competency eligibility program, and education and training service software, (2) Guidelines of the graded education and training program tools instruments, (3) Guidelines of competency eligibility program instruments, (4) Competency mapping Program Software (5) Software usage manual.

## 2. Experts Validation and Revision

The validation phase was an activity to judge the product design by experts to declare whether the product was rationally valid and able to solve identified problems. In terms of the validation process, Sugiyono (2009:414) said that product validation could be done by inviting experts experiencing to judge new products. Tessmer (1998) confirmed that it was enough to determine validity or truth by having expert judgement. The validation process for the initial product was conducted by choosing experts, making validation tools, and determining validation procedures. The chosen expert from the center of teacher and education staffs education and training was those who had position, extensive knowledge, competent, comprehensive, and experience in policy of education and training program and management as well as *programmer* in developing *software* application.

The validation tools consisted of 1) introductory letter, 2) initial products consisting competency mapping based education and training, guideline book of the graded education and training model tools design instrument, guideline book of the competency eligibility model tools instrument, competency mapping *software*, competency mapping software usage manual, (3) validation sheets and open as well as closed verification or questionnaire. The validation tools for software usage were *black box* trials. The validation procedures were as follow (1) submitting validation tools, (2) explaining products being validated, (3) direct dialogue of the initial product, (4) taking validation results, (5) consulting revision, (6) having truth justification from experts. The validation procedure in the phase of revision consultation and truth justification was called Delphi techniques or *Expert Judgment*, which is a technique to make decision by a group of people comprising experts of the concerned decision (Depdiknas, 2008) by starting from problem identification to be solved (Harold 1975; 40-45). The competency mapping software product procedure comprised (1) handing the *software* to the software trial laboratory at the center of teachers and education staffs development and empowerment in Malang, East Java, Indonesia, (2) *black box* examination at the laboratory, (3) results of the *software* trial.

## 3. Small Scale Field Trial and Product Revision

The expert validated product was trialed in the small scale field as the followings:

- a. The small scale competency mapping based education and training model was focused on the level of usage, the level of usage ease, the level of completeness, and the level of model readability.
- b. The small scale trials in terms of the instrument development was done by (1) inviting respondents of 12 the so-called Widyaiswara (senior trainers) representing study programs at the center of teachers and education staffs development and empowerment in Malang, (2) giving explanation of first product, second product, and third product to respondents,

(3) the respondents filled out instruments suitable to the product being developed, and (4) respondents filled out the closed and opened questionnaires.

c. Small scale trials of the *software* competency mapping usage was done by (1) inviting respondents comprising the 12 Widyaiswara (senior trainers), 6 managers of Vocational Schools, and 24 teachers of vocational schools being trained and developed by the center of teachers and education staffs development and empowerment in Malang areas, (2) giving explanation of the fourth and fifth products to the respondents, (3) having respondents to input data to the *software* and (4) having respondents to filled out the opened and closed questionnaires.

d. Explanation of first, second, third, fourth, and fifth products was done by the researcher himself.

e. The usage level, ease of the usage, completeness, readability were measured by using *one-shot case study* type (Mertens, 2010), which was an experiment giving treatment to the respondents, as follow:

“XO”

X = *experiment treatment*

O = *observation of the dependent variable (e.g. Pre test, post test or interim measures)*

f. Results of the respondents judgements were used as the reference of model analysis to revise product. After the product was revised, the product was trialed in large scale field.

#### **4.Large Scale Field Trial**

The revised small scale field was then trialed in the large scale field as follows:

a. The trial of the competency mapping based teachers and education staffs development and empowerment model was focused on the level of usage, level of usage ease, level of completeness, and the redability of the model.

b. The large scale field trial of the the competency mapping based teachers and education staffs development and empowerment model was done by (1) inviting respondents of 24 the so-called Widyaiswara (senior trainers) representing all departments of the center of teachers and education staffs development and empowerment in Malang, (2) giving explanation of the first product, second product, and third product to the respondents, (3) the respondents filled out instruments suitable to the product being developed, and (4) respondents filled out the closed and opened questionnaires.

c. The large scale field trial of the competency mapping software usage was done by (1) inviting respondents of 24 the so-called Widyaiswara (senior trainers), 12 managers of the vocational schools being trained and developed by the center of teachers and education staffs development and empowerment in Malang and 48 teachers of the same schools, (2) giving explanation of the fourth and fifth products to the respondents, (3) having the respondents to input data into software, (4) having the respondents to filled out closed and opened questionnaires.

d. Explanation of the first, second, third, fourth, and fifth products was done by the researcher himself.

e. The levels of usage, usage ease, completeness, and readability were measured by *one-shot case study* (Martens, 2010), which was the experiment by using treatment to the respondents as follow:

“XO”

X = *experiment treatment*

O = *observation of the dependent variable (e.g. Pretest, posttest or interim measures)*

f. Results of the respondent judgement for those levels were used as reference to analyzed the model and recise the final product. The final product was implemented at the center of teachers and education staffs development and empowerment in Malang and in other cities in Indonesia as well as at vocational schools across Indonesia.

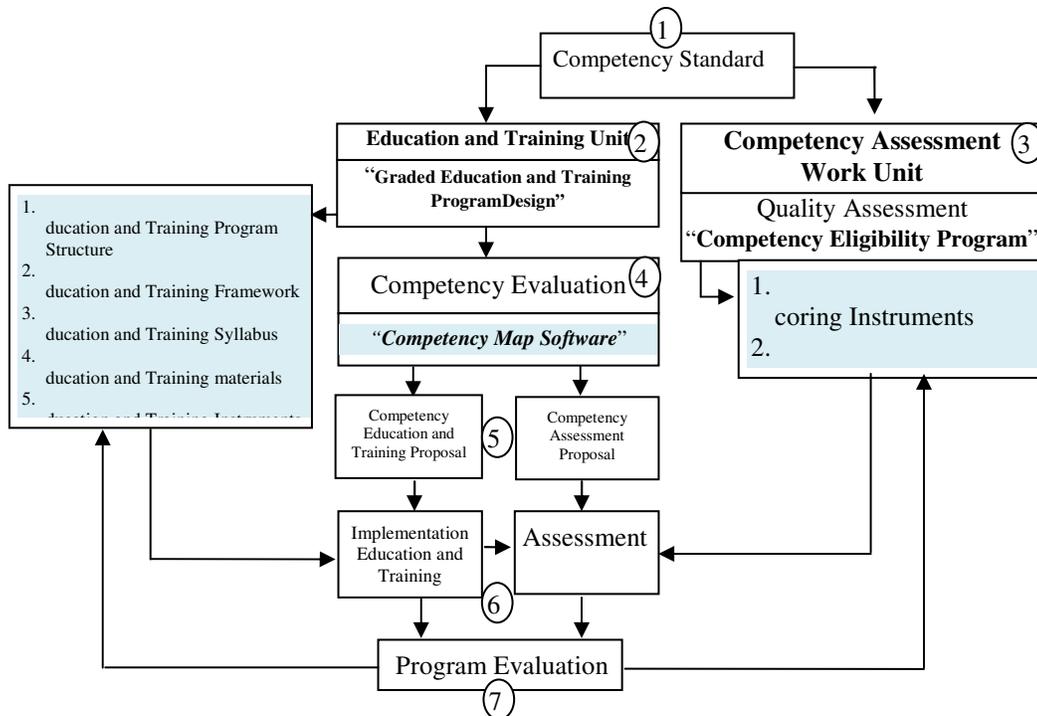
### **5. Final Product and the implementation of the Product**

The final product was implemented in the graded education and training program, making competency eligibility program, determining the needs of education and training, and determining participants of the education and training as follows:

- a. The product implementation was focused on the designing of graded education and training program, designing competency eligibility program, competency mapping software usage, and implementation of the education and training using the competency mapping based model program.
- b. The measures of the product implementation success was focused on the level of model effectiveness, which included level of the suitability between product and developed model, level of product attainment which was the extend the developed instruments resulted useful product for institution and the attraction of the product towards the respondents.
- c. The program implementation was done by (1) inviting respondents consisting 101 Widyaiswara (senior trainers) of the center of competency mapping based teachers and education staffs development and empowerment in Malang, 48 Widyaiswara (Senior trainers) of the center of teachers and education staffs development and empowerment, Department of TK and PLB in Bandung, and 46 Widyaiswara (Senior trainers) of the center of competency mapping based teachers and education staffs, in Jakarta for the language department, and (2) giving explanation of the first and second products, (3) having the respondents to filled out instruments suitable to the products, and (4) having the respondent to fill out the opened and closed questionnaires.
- d. The product implementation at the phase of competency eligibility program design was done by (1) inviting respondents of 101 Widyaiswara (Senior trainers) of the center of teachers and education staffs development and empowerment, in Malang, (2) inviting 84 vocational school teachers to participate in Assessors education and training, (3) giving explanation of the first and third products, (4) having the respondents to filled out instruments suitable to the third product, (5) having the respondents to filled out closed and opened questionnaires.
- e. Competency Software implementation was done by (1) inviting respondents of 24 competency administrator to input data, (2) socializing the program to representative vocational schools across Indonesia, (3) giving explanation of the fourth and fifth products, (4) filling out the vocational schools and their teachers data, (5) having teachers' self evaluation, (6) filling out the closed and opened questionnaires.
6. The implementation of the competency mapping based teachers and education staffs program implementation was done by (1) selecting candidates of participants using competency mapping software data base, (2) inviting education and training participants in 59 classes, (3) conducting the education and training, (4) conducting competency assessment, and (5) publishing the competency certificate.

### **Results**

The final results of this research was five products comprising (1) the concept of the competency mapping based education and training model program, (2) the guidelines of the graded education and training program tool design usage, (3) the guidelines of the competency eligibility program tools instrument usage, (4) the competency mapping software, (5) the usage manual of competency mapping software. These five products were used to support the competency mapping based education and training program management which were visualized in figure 2.



**Figure 2 Competency Mapping Based Education and Training Program Model management.**

The Competency Mapping Based Education and Training Program Model Management consisted of seven phases as follow: (1) determining competency standard, (2) designing education and training program, (3) designing competency eligibility program, (4) conducting competency evaluation, (5) proposing candidates of education and training as well as participants of the competency assessment, (6) doing the education and training as well as competency assessment, and (7) program evaluation. Results of this product trials were as follow:

Experts validation towards the five products showed that the levels of usage, usage ease, completeness, and model readability were categorized as very high having average score of 0,95 % or 4.74 with revision in language structure and objectives of each instrument. This means that the model was eligible to use and could be continued to field trials. Experts validation on the competency mapping software was concluded as valid enabling the software to be jused in the field trials.

The small scale field trials of the levels of usage, usage ease, completeness, and model readability through ther five products attained the average score of 4,63 or 0,92% which were categorized as very high with revision on instruments numbers and codification as well as software display. This means that the product was eligible to be used and continued to the large scale field trial. The large scale field trial of the levels of usage, usage ease, completeness, and model readability through the five products attained average score of 4.634 or 0,92% which was categorized as very high with revision on the refining words structure.

The overall results indicated that the five products developed were eligible to use for the product implementation. This was inline with what Tessmer (1998) said that a product or program was considered as practical when people who used the product considered that the product was usable. The trials showed valid results as compared to this statement. Tessmer (1998) further said that a product or program could be said as valid if the product or program reflected the *state of the art of knowledge* or content validity.

Results of the implementation of Competency Mapping Based Education and Training program in terms of the effectiveness level through five products attained average suitability score of 4.85 or 0.95 % which was categorized as very suitable with the model developed by the researcher. According to Tessmer (1998), a product or program can be said as effective if the product or program is suitable with that of being developed by the researcher. Results of the model implementation in terms of the attraction reached the average score of 4.86 or 0.97 % which was categorized as very high. This means that the Competency Mapping Based Education and Training Program Model could become the choice for the education and training institutions to apply. Results of the product implementation in terms of the participants' satisfaction reached the average score of 4.60 which was categorized very high. This means that the assessment tools and instruments provided the feeling of fairness among the competency assessment participants. The overall implementation of the Competency Mapping Based Education and Training Program Model reached 59 classes and their post education and training competency assessment reached the overall average score of 76.5. The general competency assessment resulted the average score of 85.6 exceeding the minimum criteria of competency assessment, which was 80. This can be said that the education and training with post competency assessment ensure the quality of education and training as well as the general competency.

### **Discussion**

Having the results of product trials and competency assessment through out the five products as well as the implementation after products trials, the education and training institutions which were the center of teachers and education staffs development and empowerment accepted the products to be implemented in all centers across Indonesia. The products were considered to be usable for designing graded education and training program, assuring the quality of the education and training, as well as using the software for better quality of education and training services. The strengths of these products were (1) the innovation moving from the unclear structure of training to the graded education and training on the basis of the competency trees philosophy comprising the basic competency, core competency, developing competency, competency standard based need analysis, theme based competency units suitable to the standard, and using program tools and instruments including education and training program structure, education and training program framework, education and training syllabus, education and training materials, education and training media, and education and training resources, (2) innovation in terms of the competency eligibility by having the new framework comprising the education and training followed by competency assessment, quality assurance through general competency assessment, involving independent and objective institutional assessors, having standardized competency assessment instruments, and being able to publish competency certificate, (3) competency mapping software model allowing the valid and reliable participants data base, enabling self evaluation, enabling to display individual competency profile, school profile, Regional profile, provincial and national

profiles, and enabling to propose proper, eligible, and valid candidates, as well as having the education and training directory.

The weaknesses of this research products were noted as (1) the graded education and training model relied on the expertise of mapping the competency standar into education and training program structure, grading regulation, competency standard changes causing changes in education and training themes, materials, and tools, (2) the competency eligibility model had limitations of numbers of assessment instruments, differences of the assessment time for each competency standard, assessment data security, examiners working units, and standarization of the assessment isntruments, (3) the competency mapping software had limitations of simple program application applicable for the education and training suitable to the objectives of this research, online education training management servises requireing big and fast processors, big memory, large hardisk space, and big bandweight.

### References

- Anwar, I.M. (2003)*Administrasi Pendidikan dan Manajemen Biaya Pendidikan* (Teori, Konsep dan Isu). Bandung: Alfabeta.
- Depdiknas. (2008).*Metode Penelitian Pengembangan*. Pusat Penelitian Kebijakan dan Inovasi Pendidikan. Jakarta: Badan Penelitian dan Pengembangan Departemen Pendidikan Nasional.
- Gall, M.D; Gall, J.P, & Borg, W.R. (2003). *Educational Research: AnIntroduction*. New York: Longman.
- Harold A. Liston. (1975). *The Delphi Method*. Edited with Murray Turoff. Addison-Wesley.
- Laird, Dugan. (1985). *Approaches to Training and Development*. Addison-Wesley Publising Company.
- Merten, Donna M.(2010). *Research and Evaluation in Education and Psychology: Integrating Diversity wit quantitative, qualitative, and Mixed Methods*. Thousand Oaks, California.
- Nadler, L. (1982). *Designing Training Program: The Critical Events Model*. Reading., Massachusetts: Addison- Wesley Publishing Company.
- Peraturan Pemerintah nomor 101 tahun 2000. Tentang Pendidikan dan Pelatihan Pegawai Negeri Sipil*. Jakarta, Depdiknas.
- Pont, A.M. (1991). *Developing Effektive Training skills*. In Roger Bennet (Ed).London: McGraw-Hill Boo Company.
- Sonhadji, K.H, H.A. (2001). *Manajemen Pendidikan dan Pelatihan*. Malang: Universitas Negeri Malang
- Sugiono. (2009). *Metode Penelitian Pendidikan Pendekatan Kualitatif, Kuantitatif dan R&D*. Bandung: Alfabeta
- Supriyono.(2015).Profesionalisasi Guru Bahasa Inggris Sekolah Yayasan Pendidikan Jayawijaya Menuju Sekolah Bertaraf Internasional:Sebuah Analisis Reflektif.*KONSTRUKTIVISME*.Vol 7, No. 1 Januari 2015, <http://www.Jurnal-konstruktivisme.info/>, <http://konstruktivisme.unisba bli tar.ejournal.web.id/>
- Supriyono.(2016).G\*GOLD Approach to Character education.*KONSTRUKTIVISME*.Vol 8, No. 1 Januari 2016, <http://www.Jurnal-konstruktivisme.info/>, <http://konstruktivisme.unisbablitar.ejournal.web.id/>
- Tessmer, Martin. (1998). *Planning and Conducting Formative Evaluations*. Philadelphia: Kogan Page.
- Torrinton, D.,& Huat, T.C. (1994). *Human Resource Management for Southeatst Asia*. Singapura: Prentice Hall.

*Undang-Undang Nomor 20 tahun 2003. Tentang Sistem Pendidikan Nasional 2003.*  
Jakarta, Depdiknas.

Van den Akker J., (2006). *Educational Design Research*. London and NewYork:  
Routledge.

-----XXXXXXXXXXXXXXXXX-----