The Effectiveness Of The Competency Based E-Training Model In Software Development In Accordance With The National Board Of Professional Certification Standards

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Abstract:

The development resulting from this research is an E-training model and will be useful for Asesi candidates who want to take a competency test for the Programming Sub-Sector Software Development in accordance with competency test standards from the National Professional Certification Agency. The resulting E-Training model can be used for other competency test areas. Training applications that use the E-Training Model will overcome the problems of Asesi candidates in preparing for the competency test. This research expands and develops a model of E-Training or E-Learning that already exists and is used to increase competence. This type of research is included in Research and Development research, known as Research And Development (R&D). To see the effectiveness of the product, experimental trials were carried out, using the One-Group Pretest-Postest Design, at the level of understanding of the participants using an observation sheet in the form of an assessment rubric. In the effectiveness of the model, it can also be seen that the activity of the Asesi candidate is increasing. The results showed that there was an increase in the competence of the Asesi candidate, so the model developed for E-Training was included in the very effective category.

Keywords: Competency Based E-training, Competency Test, Model Development, National Agency for Professional Certification.

INTRODUCTION

The National Agency for Professional Certification (BNSP) is abbreviated as BNSP institution independent which is formed government based on Law Number 13 of 2003 concerning Manpower, which in Article 18 paragraph (4) states that to carry out work competency certification an independent national professional certification body is formed. The National Professional Certification Agency is an independent body that is responsible to the President who has the authority as a personnel certification authority and is tasked with implementing professional competency certification for workers.(Law of the Republic of Indonesia Number 13 of 2003 concerning Manpower, 2003). The establishment of the BNSP based on the Government Regulation of the Republic of Indonesia Number 23 of 2004 concerning the National Professional Certification Agency, is an integral part of the development of a new paradigm in the system of preparing a qualified workforce.(Government Regulation of the Republic of Indonesia Number 23 of 2004 concerning the National Professional Certification Agency, 2004).

The Competency Test is carried out by a competency test institution that has been registered with the BNSP. An assessee who passes the competency test will receive a competency certificate issued by the National Professional Certification Agency. Competency testing institutions have a permit to organize a professional certification scheme and is a specific certification requirement related to a defined

professional category using the same standards and special rules, as well as the same procedures.

The Professional Certification Scheme implemented by the competency testing institution is included in the National Occupational Qualification Professional Certification Scheme. All schemes are packaged with occupational packages (job positions) and refer to the SKKNI. This certification emphasizes the competencies that must be possessed by a position that is determined nationally and should be able to be adapted to international standards or be portable between countries. For example, for the programmer profession, IT Auditor, and so on, even though they come from different industries, the competency standards of someone holding the position should be the same and can be measured.

Because this scheme applies nationally and is portable between countries, the National Occupational Qualification Certification scheme is determined by a Schema Committee formed by the competent authority in its field. In this scheme, it can consist of competency units of various levels according to the consensus in the scheme committee consisting of professional associations, industrial associations and competent authorities. The National Occupational Qualification Scheme can have a level that is able to synergize with the KKNI. Kom info said that Indonesia is still in crisis for programmers. Indonesia in 2017 only had 15,000 people who were certified, compared to the number of graduates of vocational education in ICT per year which reached more than 500,000 people.(Menkominfo, 2017).

From the description presented, it can be seen that there are a lot of knowledge and skills that must be possessed by a candidate who will take the competency test. The knowledge and skills required are a combination of various materials in several courses in the field of Computer Science. In general, candidates for competency test in the field of software development sub-field programming have a background knowledge or education in the field of Computer Science. Some of the candidates for the assessment are final year students, undergraduates or practitioners in the field of computer science. The material to be tested

has been obtained by prospective assistants during the lecture process or from work experience. The competency test material in the software development sub-field of programming is a combination of parts of courses that have been studied by prospective assessors or part of work experiences in the field of computer science. This material or experience will be summarized as a competency test material for the software development sub-field of programming. However, not all asesion candidates have the ability to assemble or combine various materials and experiences into a programming competency.

The solution that can be given to asesee candidates in order to pass the competency test and be able to assemble and combine their knowledge into a profession, especially programmers, is to provide knowledge and skills to asesee candidates through a learning activity or training based on competency mastery. Mastery of competence is the result of an individual's learning experience that requires critical convergence of several vectors, namely the right learning model, the right technology, the right customer, and the right business model.(Weise & Christensen, 2014). There are several things that must be considered related to the implementation of this learning activity, including the differences in the ability of prospective participants in mastering a competency. Each candidate is different and will require a different amount of time to master the competencies(Weise & Christensen, 2014).

Carroll argues that if each assessor candidate is given the time needed to achieve a certain level of mastery, and if he spends the necessary time, it is highly likely that the candidate will reach that level of competency mastery. However, if the candidate for assessee is not given enough time or he is not able to use the required time fully, then the level of mastery of competence will not be achieved. Competency achievement is determined by how much time is actually used to learn divided by the time it takes to master certain competencies (Carroll, 1989).

US Department of Education (DoE) in(Voorhees, 2001)emphasized that one way to improve student achievement is to consider competency-based

learning. DoE describes competency-based learning as "a structure that creates flexibility, enabling students to progress as they demonstrate mastery of academic content, regardless of time, place, or pace of learning." Competency-based learning focuses on outcomes and skills. Learners are encouraged to learn in a way that allows them to use reproducible skill sets to produce tangible results. The US Department of Education (DoE) reveals that competence is the bridge between the size of the credit system and the learning revolution.

Workforce training, competency-based learning, and online learning are definitely not new phenomena, but online competency-based education is revolutionary because it marks the critical convergence of several vectors: the right learning model, the right technology, the right customer, and the right business model. By breaking down learning into competencies, rather than by courses or even subject matter, these service providers can effectively combine learning modules into a pathway that is flexible and adaptable to the changing labor market.(Weise & Christensen, 2014). For now, from the results of interviews and observations made to several institutions or organizations, it turns out that there is no institution or organization that provides an online learning or training activity to prepare prospective candidates for the Competency Test for Software Development in the Programming Sub-Sector in Indonesia.

Based on the description that has been explained and related to the data and facts that have been presented, it is necessary to have an online training model that can be used to improve the competence of prospective assayers to take part in the competency test in the field of Software Development Programming. So that in the end, the candidate can become a programmer who has been certified to the standards of the BNSP and the candidate can meet the needs of programmers in the world of work.

METHOD

Development research is a process used to develop and validate educational products. Products mean not only things like textbooks, instructional films, and computer tools, but also teaching methods and educational programs. The same thing was conveyed by (Plomp & others, 2013)stated that, "Design research is the systematic study of designing, developing and evaluating educational interventions (such as programs, teaching-learningstrategies and materials, productucts and systems) as solutions for complex problems in educational practice, which also aims at advancing our knowledge about the characteristics of these interventions and the processes of designing and developing them".

R&D research stages requires a model called a development procedure, among the models used in the R&D research stage is the ADDIE model, which includes the steps of Analysis, Design, Development, Implementation, and Evaluation. (Branch, 2009).
ANALYSIS Stage Conducting a search related to the need to develop a Competency Based e Training Model for prospective assistants in facing the competency test in the software development sub-field of programming. Conduct a theoretical study of the Competency Based e Training model. Conducting observations and interviews with assessors, assessors and organizers of the Competency Test Place. Performing a needs assessment of the training model.

Design stageGrouping Performance Criteria (KUK), Variable Limits, Assessment Guidelines, and Critical Aspects of all Competency Units. Make a table of Units, Unit Codes, Unit Titles, Element Numbers and a list of questions for each Competency Unit. Designing the media interface to be developed. Design the format of the product to be made. Designing the syntax of the competency based eTraining model, Designing the competency based eTraining model book based on the results of the needs analysis. Designing competency based eTraining module books/materials, Designing media usage manuals. Development stage Produce products which include model books, media, module/teaching books, manuals/instructions for using media. Assessing the effectiveness of the test subjects on

the developed model through filling out the instrument on the use of media, modules and manuals.

Effectiveness seen from the results of the competency test self-test using model competency based e Training. Learning outcomes are obtained by administering a competency self-test to candidates who have been treated training practice using models competency based e Training which is valid and practical. There's according to maanchovy competency test in the treatment carried out. Competency test questions are in the form of competent or incompetent choices in accordance with the questions from the National Professional Certification Agency. Data retrieval is done by giving a preliminary test and a final test to the candidate of asesion by using competency test questions from BNSP which are made for this purpose and checking the results of the tests that have been given. Model effectiveness competency based e Training determined by looking at the results of the participant's competency test before and after use model competency based e Training by conducting a preliminary test and a final test. Effectiveness model competency based eTraining also determined by the analysis of the results of the Preliminary-Final Test.

Analyze achievement of participant competency test results before and after using model competency based e Training. Calculation of the effectiveness of the media using the paired sample t-test formula (related sample). To compare the state of the research object before and after the treatment can be tested with the following paired t-test formula, (Sugiyono, 2013).Implementation stage implementing a competency based eTraining model in the competency test scheme in the software development sub-field of programming. Testing the learning outcomes of asesion candidates after using competency based eTraining. Improve competency based eTraining and media/application models.

RESULTS

In this research, he developed a learning model that resulted in a Competency Based eTraining model.

The product results in the development of the Competency Based eTraining model will produce 1). Competency Based eTraining model book, 2). Textbooks/modules, 3). application/media usage guide book for assessors and assessors, 4). Application/ training media at the site address www.merdekasiswa.club. This research produces an E-training model for competency testing in the software development sub-field of programming. The development of this model uses procedural development stages based on needs analysis so that the problems contained in the training are known. Based on the stages of the development research procedure described previously, a valid, practical and effective Competency-based eTraining model is produced. However, the what, why and how of the Competency based eTraining model really need to be discussed and discussed in this section of the discussion.

The training process, which has been limited by place and time, because asesee candidates have various backgrounds and differences, in dealing with problems like this, it is necessary to make changes in the training process, one of which is by changing the existing regular training model to the E-model. training, which can guide and train prospective participants in developing their creativity in learning so that they can improve skills and learning out comes. One of the E-training models that can bridge these problems is the Competency-based eTraining model which is an active E-training model that can provide opportunities for prospective participants to think actively and develop their creativity and can produce learning outcomes that are able to answer the challenges of the world of work and society will programmer needs.

Competence is an implication of the concept of ability and qualification resulting from the rapid evolution of vocational education in work organization and planning (Grootings, 1994). So that competence becomes a professional act and a number of important competencies needed by students can become professional assignments (Echeverría, 2002). Competency based eTraining model is a training or skill education process that is designed and implemented. Competency based

eTraining emphasizes training, where participants (prospective asses) can carry out training activities according to the procedures and steps required in the competency test in the software development sub-sector of programming.

Competency based eTraining model is defined as procedures or steps that need to be taken by educators to facilitate students to actively learn, participate and interact (Chinnowsky et al., 2006). So that the Competency-based eTraining model is an effective model for competency-based education (Parsons et al., 2005; Mulcahy, 2000; Kelly, 2007) which is integrated with knowledge and skills. The Competency-based eTraining model is an E-training model that provides an opportunity for aspiring candidates to be able to develop critical thinking skills and skills as well as to work together (Nickerson, Perkins & Smith, 1985), which is very relevant to the psychological development of asesion candidates regarding their learning experiences (Gijselaers). , 1996). In the training process with the Competency-based eTraining model, students are required to be active, such as answering and completing competency achievements in accordance with the competency test material. The Competency based eTraining model consists of steps in the training process.

The Competency-based eTraining model is one alternative in answering the problem of the training process for competency testing in the software development sub-field of programming. The effectiveness test is seen from the increase in participant activity and the increase in the results of online self-assessment. The increase in competency achievement results is seen from the cognitive aspects of the trainees. The effectiveness test for the cognitive aspect was carried out by providing initial and final self-assessments to participants. The instrument is in the form of a choice of competence as many as 35 questions for the competence of the candidate for assessment. The results of the assessment on each of these aspects are then compared to see the effectiveness of the Competency based eTraining model applied. A total of 33 candidates for assessment took part in the initial and final assessment which were divided into two (2) groups/classes, namely the experimental class with 18 candidates for the assessment and the control class with 15 candidates for the assessment.

Based on the results of data analysis using SPSS 27, it can be seen that a significance value of 0.001 is smaller than 0.05, so it can be concluded that there is a significant difference between the Initial and Final Self-Assessment. The results of the Final Assessment competency test are better than the results of the Initial Assessment competency test, this can be seen through the average Final Assessment result which is greater than the Initial Assessment. Thus, it can be concluded that the Competency-based e-Training model is effectively used by the candidate for preparation for the competency test.

CONCLUSIONS

Based on the results of the research on the development of the E-training model that has been carried out, the following conclusions are obtained, the Competency Based eTraining model that has been made with the following syntax: a) Determination of competency unit achievements in accordance with the competency test scheme to be followed, b) Presentation of the material in a comprehensive manner. online which is divided into competency units, c) initial self-assessment, d) online independent learning and e) final self-assessment. The products that have been made are Competency Based eTraining model books, module books/materials, user manuals for eTraining systems for assessors and assessors and eTraining applications. Through E-training which is integrated in the training model, it can improve the competence of prospective competency test participants in the field of software development, sub-field programming.

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