

The Validity of Training Models Based on Knowledge Management Systems

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The development of training models relevant to teachers' needs is used to improve teachers' competences and professionalism. This article discusses the validity of the training model based on the knowledge management system for vocational high school teachers of computer network engineering skills, which aims to foster their professional competence. The research methodology is research development with the ADDIE Development Procedure. The development of this training model uses a modified Pont training model. This training model produces syntax: a) introduction; b) demonstrations; c) discussion; d) implementation of B-KMS training; and e) training evaluation and products, comprising (1) training model book; (2) training manual; (3) training material books; (4) user manuals for administration and user usage; (5) knowledge management system application. The result of the validity analysis shows that the training model is valid (0.85), the training model book is valid (0.89), the training manual is valid (0.89), the training material book is valid (0.86), the application instruction manual for the administrator is valid (0.89), user manual application usage is valid (0.89) and knowledge management system application media is valid (0.89).

Key words: *Training model, Knowledge management system, Professional teachers' competence, Computer networking technique.*

Introduction

The development and improvement of professional skills must be created in regard to the needs or problems faced by teachers. In the law of the Republic of Indonesia no. 14, 2005 concerning teachers and lecturers in article 20 and point (b), it is delineated that in order to carry out professional duties, teachers should continuously develop their academic qualifications and competencies regarding the development of science, technology, and art. The main point of this law is teachers should have: (1) a minimum academic qualification, S1 or DIV, (2) competence as a learning agent of pedagogical, professional, personality and social competence, and (3) an educator certificate. The law also provides an appropriate opportunity for teachers to continually improve their professional skills through training, research, publishing scientific papers, and other professional activities both conventionally and online. Vocational education is developed following the work development and the demands of society, through two social institutions. First, social institutions of work based on effective organisation, effective division of roles or tasks, and behaviours related to the selection, acquisition, and stabilisation of careers. Second, the social institution of education along with its double functions, namely as a media of cultural preservation as well as the media of social change.

The policy requires both schools and industries to simultaneously arrange the concept, aiming to have a match between schools and industry. The competencies offered to students at school must be coherent with the competence required in the industrial world. The industries must also play an active role in conveying technological progress to the schools, syncing between the industry and the world of education. This synchronisation certainly requires human resources that have professional competence. Various efforts have been made to improve the professional competence of teachers, such as implementing the Subject Teacher Consultation. The Subject Teachers Meeting is a professional forum for specialised teachers who teach in a province, district, city, sub-district, and at grouped-schools. However, the program above in the West Sumatra Province is still ineffective in developing teachers' professional competence, whereas the usefulness of this forum is pivotally important to strengthen the improvement and mining of professional teachers' competence of Vocational High School on Computer Network Engineering skills.

The ineffectiveness of this forum is shown in a research result of the field studies conducted with teachers who were members of the Teachers' Computer Techniques Teacher Training Network in West Sumatra. Some teachers were from the Vocational High School in the regency of Sijunjung (SMK N 7 Sijunjung) and Dharmasraya (SMK N 1 Pulau Punjung and SMK N 1 Sitiung). They stated that the implementation of professional competence development through this forum is still not optimal. Sharing facilities such as practical equipment, workshops, and laboratories can only be conducted among members in adjacent

locations, while sharing knowledge and expertise are still relatively rare. This kind of sharing activity is still limited to regular meeting events in the form of Computer Network Teacher Training Subjects, which are held once every two or three months. Hence, it can be deemed that sharing resources in the Computer Teachers Teacher Training Subject Network is ineffective in improving the teachers' professional competence in Secondary Vocational Computer Networking. It is also reminded that: (1) the Computer Teacher Conference Program Computer Network Lessons generally cannot be attended by all teachers of the Vocational School Computer Engineering Competency Network, due to time and budget constraints. Therefore, teachers who do not attend the meeting often do not know the issues discussed at the meeting, (2) the topic discussed in the forum still lacks experts, (3) database documentation in each meeting is still carried out manually, that is in the form of CD or stored on the hard disks of the teachers who attend the discussion.

This condition reflects that the management of knowledge in the forum of the Teachers' Consultation Techniques Computer Network has not been conceptualised and managed well. It does not provide benefits among members. Whereas, teachers' professional development is a key tool to broaden understanding of new issues of education, assisting teachers to employ new learning innovations and improve their teaching (Challenge Teacher SMK 21st Century, 2013). The teachers' professional development can be achieved in various activities, such as mentoring, modelling, workshops, coursework, observation and training at leisure (Mochsen, 2015: in Challenge Teacher SMK 21st Century, 2013). One of the professional development models of teachers is training. Snelbecker (1974), states that "A model is a concretisation of a theory which is meant to be analogous to or representative of the processes and variables involved in the theory." In line with the views of Joh (2004) and Snelbecker (1974), the model in this study is essentially a conceptual concretisation used to describe the processes and variables contained in the Knowledge Management System-based training theory for School teachers concerning Secondary Vocational Computer Networking Techniques, namely: 1) the concept component (construct) based training Knowledge Management System, a definition in the form of scientific language that describes the theory of training and Knowledge Management Systems; 2) the procedure, the steps must be carried out towards the set goal; and 3) the purpose, in the form of mastery of competence of Computer Network Engineering skills.

It is important to know that professional competence is a competency needed by a teacher in supporting the learning process to produce competent graduates; graduates who can develop their skills in Computer Network Engineering and support the teacher discussion of their subjects in developing professional competence. Therefore, it is necessary to develop a model of a computer engineering skills Network-based Knowledge Management System for Vocational High School Teachers on Computer Networking Techniques. This model aims at developing the professional competence of vocational teachers on Computer Network

Engineering Skills. The knowledge Management System is a system designed to document, classify, and disseminate knowledge. The knowledge management involves the activities of an institution in managing knowledge as an asset, which is strategic to distributing knowledge to the right person faster. Consequently, they can interact, share knowledge, and apply it in their daily work to improve performance and maintain institutional sustainability. The knowledge Management System needs to be developed to assist teachers in developing their professional competence.

Theoretical Review

Competence of Vocational High School Teachers

Li et al (2011), describe competence as, “an underlying characteristic of an individual that is related to criterion-referenced effective and superior performance in a job or situation,” (The Challenge of SMK 21st Century, 2013). The Australia National Training Board (NTB) reveals that “Competencies bring all the elements of task, skill, knowledge, and add a performance standard.” Hence, a competency is written in the form of a task to be carried out, and the standard must be performed. In a bid, the competent statements, 1) unit of competency referring to the general area of the job; 2) elements of competency describes the precise tasks to be carried out and the skill required; 3) Performance criteria is known as the standard at which the trainee can be described as competent (Challenge Teacher SMK 21st Century, 2013). According to Indonesian Law no. 14, 2005, on Teachers and Lecturers, competence is a set of knowledge, skills, and behaviours that must be owned, experienced, and mastered by teachers or lecturers in performing professional duties.

Training Model

One of the professional teacher development models is training. Snelbecker (1974), states that “A model is a concretisation of a theory, which is meant to be analogous to a representative of the process and variables involved in the theory.” While Joh (2004), states that the model is similar to the theory, namely the system of postulates or an integrated sequence of the postulates. It is further explained that different models of the theory are viewed from the level of abstraction. A model is constructed from a set of high abstraction level of postulate. In line with the view of Joh (2004) and Snelbecker (1974), the model in this study is essentially a conceptual concretisation used to describe the processes and variables contained in the Knowledge Management System-based training theory for School teachers of Secondary Vocational Computer Networking Techniques, namely: 1) the concept component (construct) based training Knowledge Management System, a scientific language that describes the theory of training and Knowledge Management System; 2) the procedure, is the steps that must be carried out towards the set goal; and 3) the purpose, in the form of

mastery of competence of Computer Network Engineering skills. The training steps according to Pont (in Mudjiman, 2011) refer to a continuous cycle of activities, comprising: (1) training needs analysis, (2) training program planning, (3) preparation of training materials, (4) training implementation, and (5) training assessments.

Computer Networking Expertise

According to the Wikipedia, the Department of Computer Engineering Network is science-based Information Technology and Communications related to the ability of algorithms, computer programming, computer assembly, computer network assembly, the operation of software, the Internet. In the process of education during the Vocational High School majoring in Computer Network Engineering, students will be taught from the basic level of assembly, computer repair, peripheral repair, computer network, up to computer network security. Along with all the skills taught in full from the first level to the end, students are expected to compete based on skills in the technology-based workplace. Students who have graduated from the Department of Computer and Network Engineering will be equipped with knowledge of network science and servers, which are currently required by companies. Students can work as a computer technician, network technician, in Server Administration, Systems administration, Network Administration, EDP (Electronic Data Processing), and also as IT Staff.

Knowledge Management System

The concept and definition of Knowledge Management is proposed by Davidson and Philip Voss (Nawawi, 2012), postulating that Knowledge Management is a system that enables the company to absorb knowledge, experience, and creativity for the improvement of the company. Next, Batgeron (as cited in Nawawi, 2012), states that Knowledge Management is a systematic approach to managing intellectual assets and other information, providing a competitive advantage for the company. According to Skyrme (Estriyanto et al, 2008), "Knowledge Management is the explicit and systematic management of vital knowledge and its associated processes of creation, organisation, diffusion, use, and exploitation." Then, According to Liebowitz (1957), "Knowledge management is the process of creating value from an organisation's intangible assets." There is no single correct definition that exists, due to the absence of a universal definition of knowledge management. This definition is the definition of the formulation of Skyrme (Estriyanto et al, 2008), which most represents the notion of knowledge management based on experience and skill. Another definition of knowledge management is the process through which organisations generate value from intellectual and knowledge-based assets. Based on the above definitions, it can be concluded that Knowledge Management is a process of identifying, capturing, organising knowledge,

documenting and disseminating knowledge, possessed by individuals as an intellectual-based asset.

Method

The research methodology is the Research and Development with ADDIE Development Procedure (Analysis, Design, Development, Implementation, and Evaluation). The development of this training model uses a modified Pont training model. Validation of the Training Models Computer Networking Expertise Network-Based Knowledge Management System for Vocational High School Teachers Computer Networking Expertise Networks is conducted by experts who have knowledge and competence in accordance with the related science.

The researchers analysed the judgment experts' results using Aiken's V's validity coefficients. According to Tufail & Embi (2011), "Aiken has formulated Aiken's V formula for calculating Content Validity Coefficient based on the assessment of a panel of experts as much as n people to an item about the extent to which the item represents the construct being measured." Assessment is done by giving a number between 1 (very unrepresentative or very irrelevant) to 4 (very representative or highly relevant). Here is a formula from Aiken's V (Aiken: 1991):

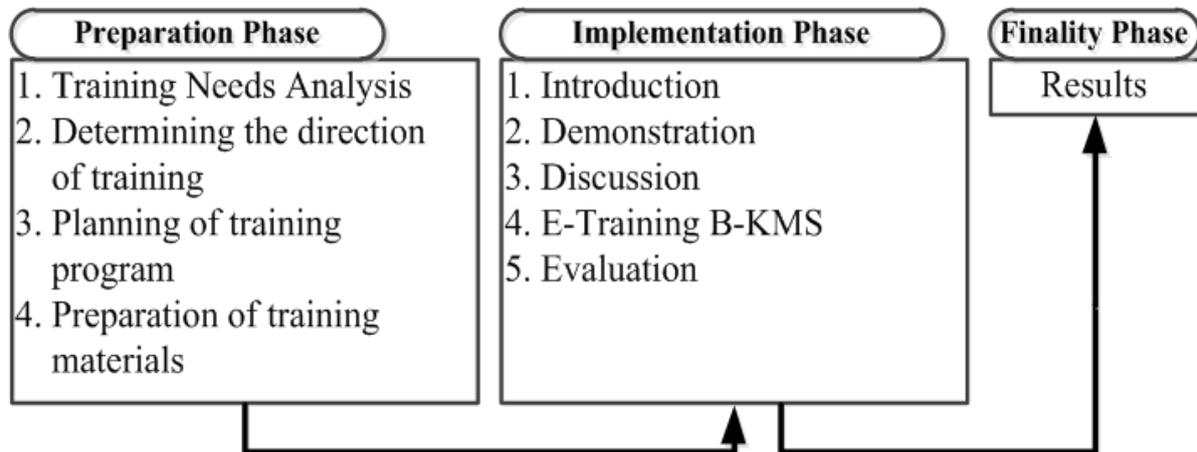
$$V = \frac{\sum S}{[n(c-1)]} \quad (1)$$

The range of numbers V that can be obtained is between 0 to 1.00, and the number 0.667 can be interpreted as a coefficient high enough for the item and declared valid.

Findings and Discussions

The training model based on the Knowledge Management System for Vocational Computer Network Engineering Teachers is designed to improve the professionalism of Vocational Computer Network Engineering Teachers, the image of this model can be seen in Figure 1.

Figure 1. Training Model Based on Knowledge Management System for Vocational Computer Network Engineering Teachers.



Referring to Figure 1, it can be seen that the training model of Computer Engineering Network skill based on the Knowledge Management System consists of five syntaxes, as follows: (1) Introduction, (2) Demonstration, (3) Discussion, (4) E-Training B-KMS, (5) Evaluation. In this research, it also produced a product of (1) Book Model Skills Training Computer Network-Based Knowledge Management System, (2) Handbook Implementation of Training, (3) Books Matter Computer Network (4) User's Guide to Application Knowledge Management System for Users, (5) User's Guide to Knowledge Management System Application for Administrators and (6) Knowledge Management System application.

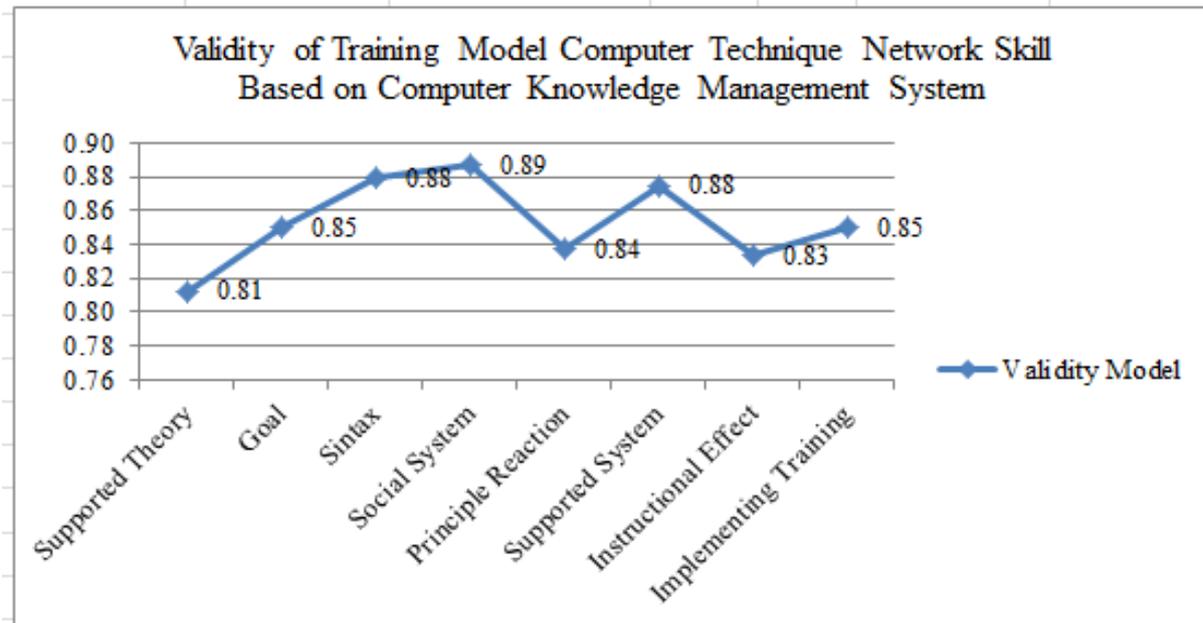
Based on the results of expert judgment, it can be explained that the assessment of Expert Validation results on each product has been developed.

a) The Validity of the training model computer technique network based on *Knowledge Management System*.

The validation done by validators towards the computer technique network skill model based on the knowledge management system consists of some aspects: (a) supported theory; (b) purpose; (c) syntax; (d) social system; (e) reaction principle; (f) supported system; (g) instructional accompanist effects; (h) implementing training. The results of the computer technique network skill model based on the knowledge management system are as follows: 1) the aspect of supported theory has an average score 0.81 as categorised valid, 2) the aspect of goal has an average score 0.85 as categorised valid, 3) the aspect of syntax has an average score 0.88 as categorised valid, 4) the aspect of social system has an average score 0.89 as categorised valid, 5) the aspect of principle reaction has an average score 0.84 as categorised valid, 6) the aspect of supported system has an average score 0.88 as categorised valid, 7) the aspect of instructional effect has an average score 0.83 as categorised valid, and 8) the aspect

of implementing training has an average score 0.85 as categorised valid, as shown in Graphic 1.

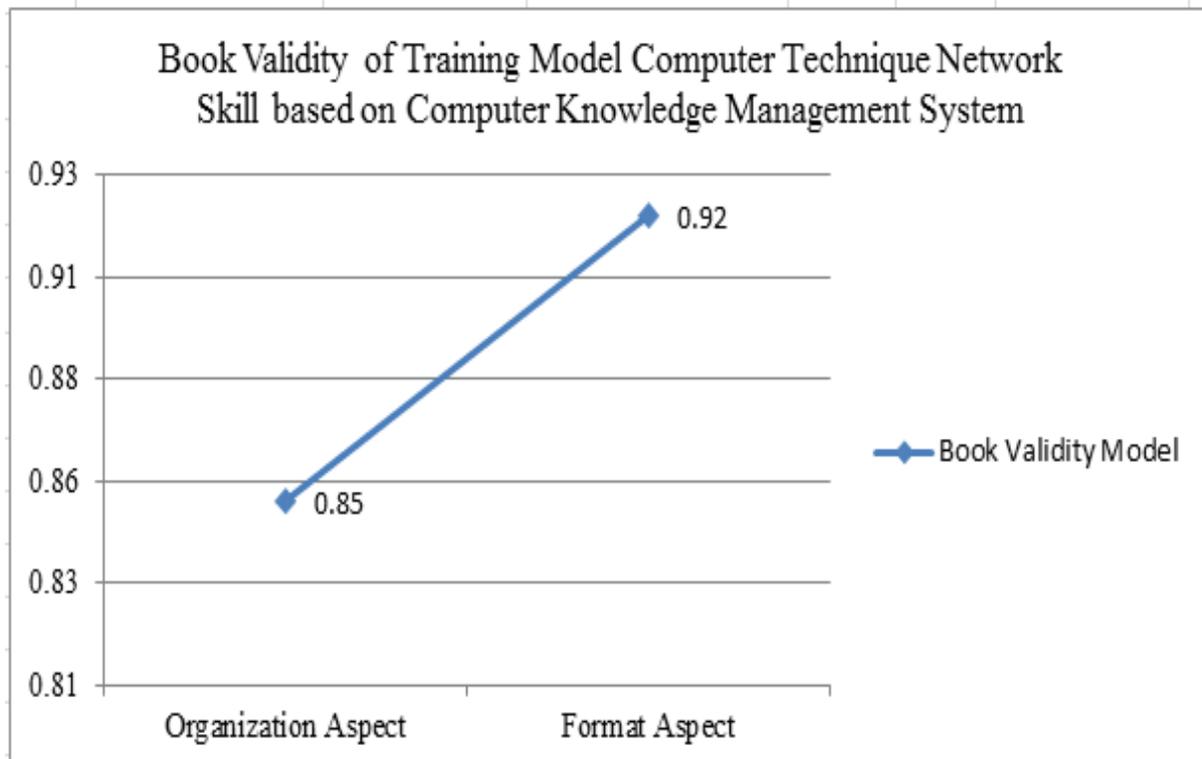
Graphic 1. Validity of Training Model Computer Technique Network Skills based on Computer Knowledge Management System.



b) Book Validity of Training Model Computer Technique Network Skills based on Computer Knowledge Management System.

The result of validity testing of the book of Training Model Computer Technique Network Skills based on Computer Knowledge Management System is as follows: 1) the organisation aspect has an average score 0.85 as categorised valid, 2) the format aspect has average score 0.92 as categorised valid, as shown in Graphic 2.

Graphic 2. Book Validity of Training Model Computer Technique Network Skills based on Computer Knowledge Management System.

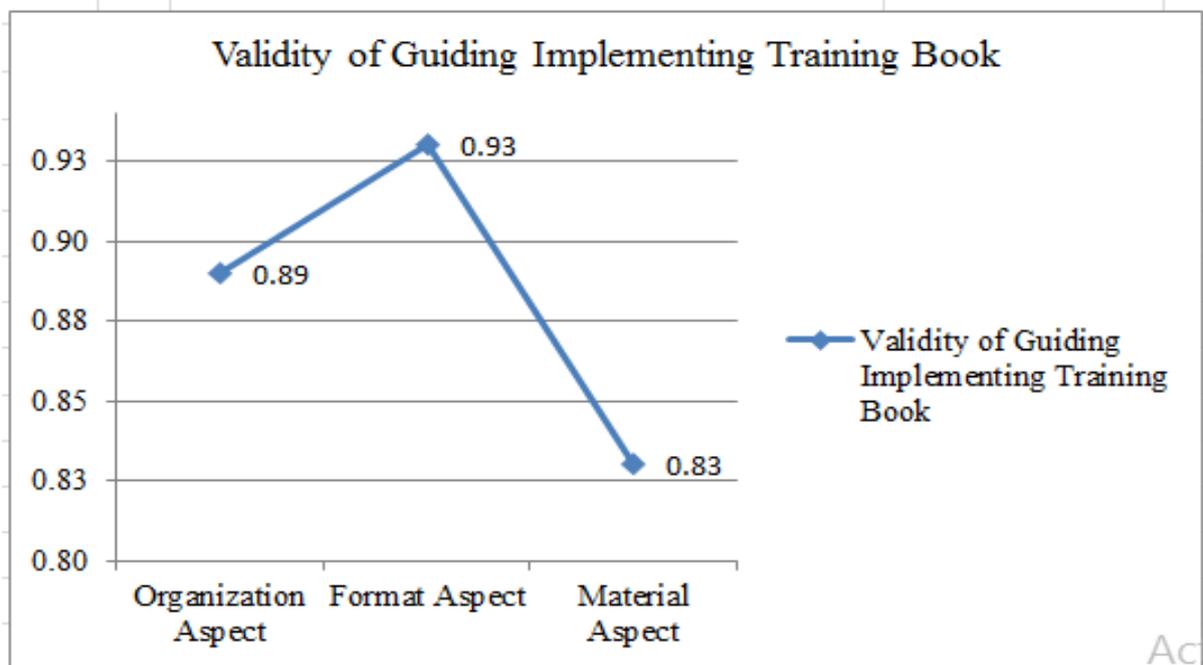


It can be said that the Book Validity of the Training Model Computer Technique Network Skills based on the Computer Knowledge Management System has been developed and stated valid by all assessment aspects.

a) Validity of guiding implementing training book

The result of validity of the guiding implementing training book is validated by validator as follows: 1) the organisation aspect has an average score 0.89 as categorised valid, 2) the format aspect has an average score 0.93 as categorised valid, 3) the material aspect has an average score 0.83 as categorised valid. It can be seen as shown in Graphic 3.

Graphic 3. Validity of Guiding Implementing Training Book

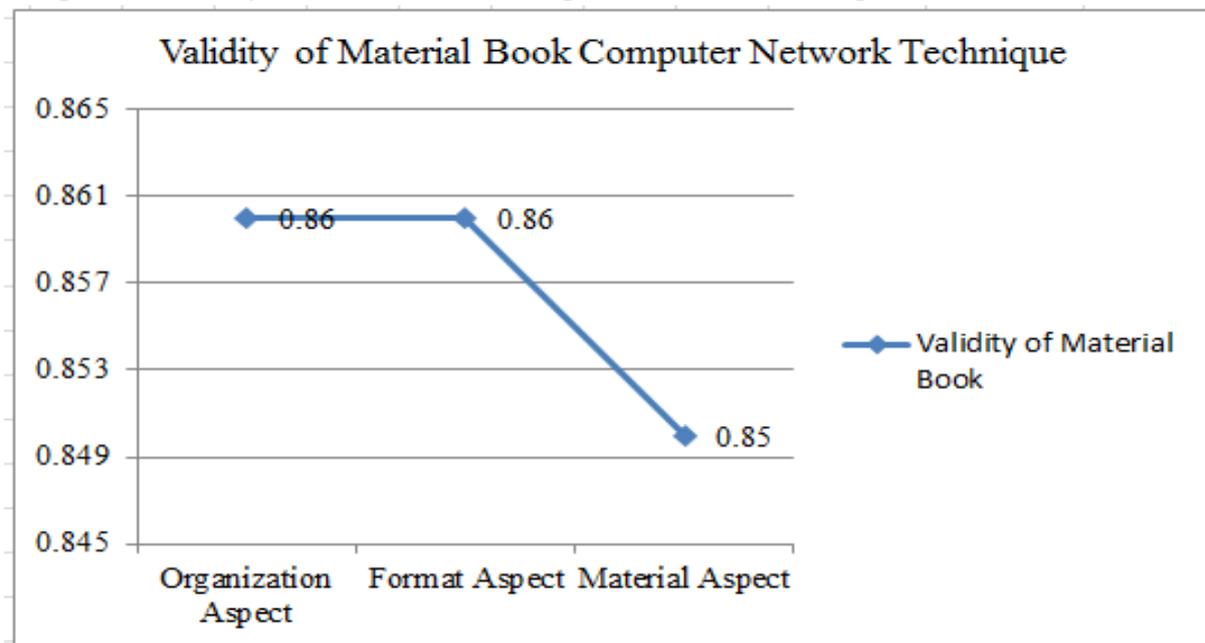


It can be said that the guiding implementing training book has been developed and stated valid from all aspects of assessment.

b) Validity of material book computer network technique

The result of validity testing of the material book computer of network technique is as follows: 1) the organisation aspect has an average score 0.86 as categorised valid, 2) the format aspect has an average score 0.86 as categorised valid, 3) the material aspect has an average score 0.85 as categorised valid, as shown in Graphic 4.

Graphic 4. Validity of Material Book Computer Network Technique

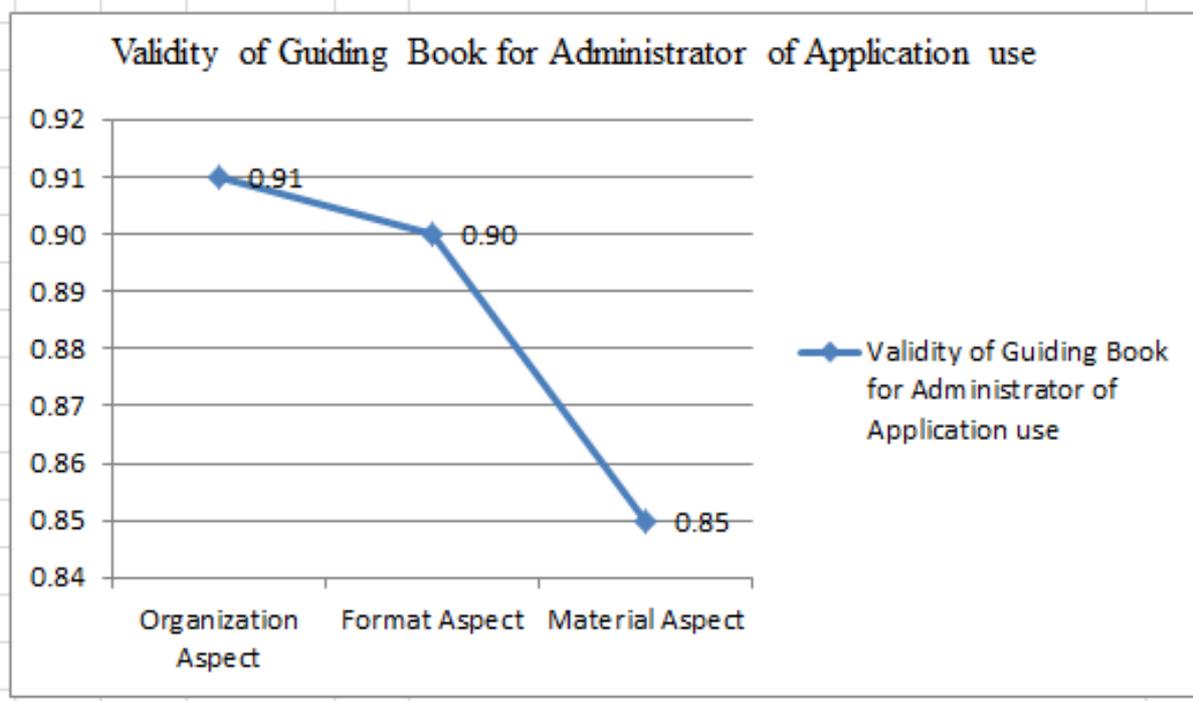


It can be said that the material book of computer network technique has been developed and stated as valid form in all aspects of assessment.

c) Validity of Guiding Book for Administrator of Application Use

The result of validity testing on the guiding book of application use for administrators is as follows: 1) the organisation aspect has average score 0.91 as categorised valid, 2) the format aspect has an average score 0.90 as categorised valid, and 3) the material aspect has an average score 0.85 as categorised valid, as can be seen in Graphic 5.

Graphic 5. Validity of Guiding Book for Administrator of Application Use

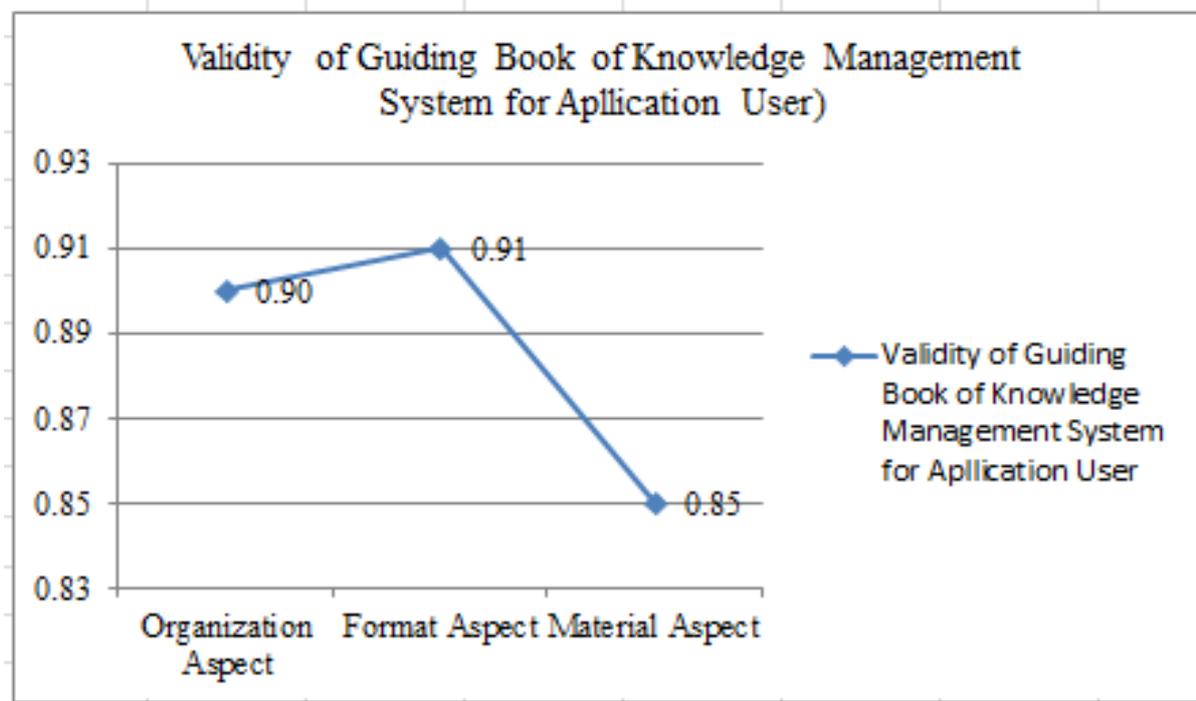


It can be said that the guiding book of application use for administrators has been developed and stated as valid from all aspects of assessment.

d) Guiding book for application user

The result of validity testing towards the guiding book for application users is as follows: 1) the aspect organisation has an average score 0.90 as categorised valid, 2) the format aspect has an average score 0.91 as categorised valid, and 3) the material aspect has an average score 0.85 as categorised valid, as can be seen in Graphic 6.

Graphic 6. Validity of guiding book for application user

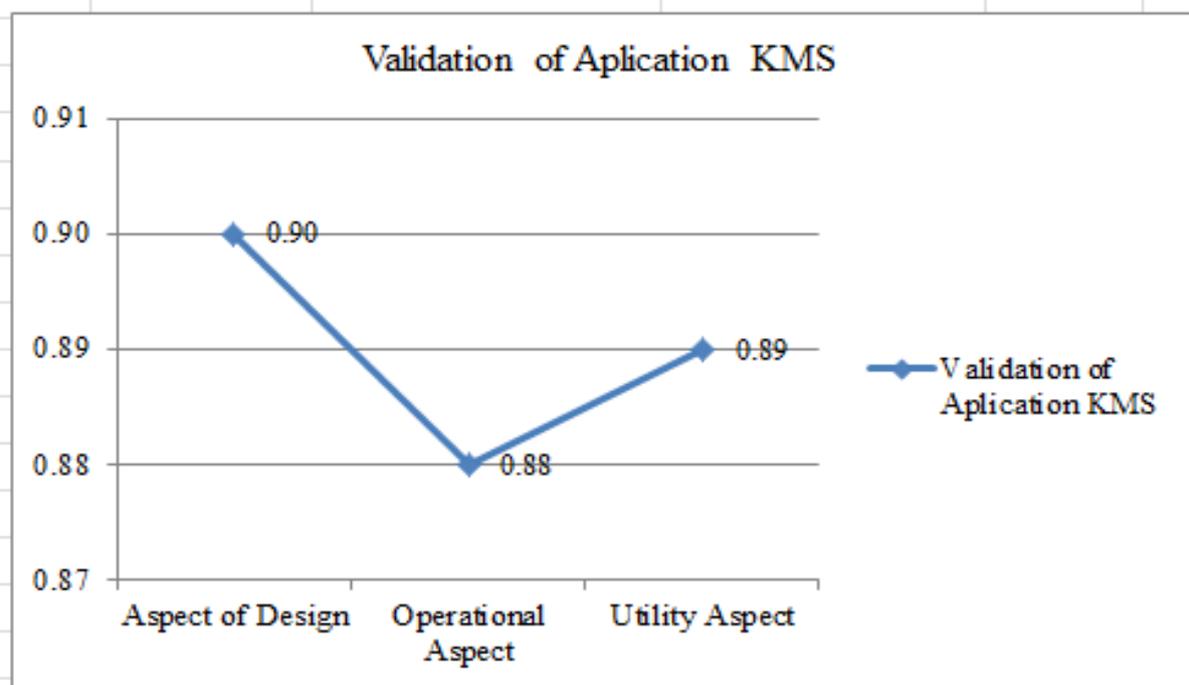


It can be said that the guiding for application users has been developed and stated valid from all aspects of assessment.

e) Media application of *Knowledge Management System*

The validity testing showed that the knowledge management system is as follows: 1) the design aspect has an average score 0.90 as categorised valid, 2) the operating aspect has an average score 0.88 as categorised valid, and 3) the useful aspect has an average score 0.89 as categorised valid, as can be seen in Graphic 7.

Graphic 7. Validity of Knowledge Management System application



It can be concluded that the knowledge management system has been developed and considered valid from all aspects of measurement.

Conclusions

Based on the explanation above, it can be concluded that the training based on the Knowledge Management System is part of continuous professional development. The research has resulted in a Skills Training Model of Computer Network Techniques Based on a Knowledge Management System with the syntax: a) Introduction, b) Demonstration, c) Discussion, d) Implementation of B-KMS Training, e) Training Evaluation, generating validity of the training model based on the Knowledge Management System.



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