

Integrating ICT to Improve Teachers Professional Competence of State Vocational High School in Medan

Sanggam Pardede

State University of Padang, West Sumatera-Indonesia

Sanggam2005@yahoo.com

ABSTRACT

This research aims to discover the impact of integrating Information and Communication Technology (ICT) to improve teachers professional competence of which the intervening variables were independent learning motivation, innovative attitude, and training with a quantitative descriptive using path analysis as the survey method. The sampling selection utilized a proportional stratified random sampling technique, with the total sample of 243 teachers from the total population of 659 teachers from 12 SVHS.

In partial and together, the direct and indirect impact of the exogenous variables were: (1) There has been direct impact of independent learning motivation, innovative attitude and training partially or together toward the ICT integration, (2) There have been direct and indirect impact of independent learning motivation, innovative attitude and training partially or together toward teacher professional competence, (3) There has been direct impact of ICT integration toward teacher professional competence, (4) There has been direct impact of independent learning motivation, innovative attitude, training and ICT integration as collected variables toward teacher professional competence.

Keywords: Professional competence, ICT integration, independent learning motivation, innovative attitude and training.

Introduction

Teacher professionalism should not be limited to the transfer of materials and teach memorization to the student, but the present teachers should have creativity in exploring the latest learning resources and give alternative solution to the student in fulfilling the learning needs based on the current condition. To balance the rapid development of science and technology in today's period, teachers should continuously learn apart his/her responsibility as teachers by reading books and browsing the internet, and attending seminars on education.

The teacher professional competence can be seen from the score results of the national teachers' pre competence test in 2012, with the average national score stood at 42.25 whereas the average score in North Sumatra Province was 37.4 (Ministry of National Education, 2012). In this case, through

pre observation that was conducted by the researcher on 12 SVHS in Medan, the average comments of teachers that the social interaction with students did not have to be conducted in depth manner. During the instructional process, teachers of SVHS ini Medan used more textbooks, without any innovation being applied to the learning materials based on the curriculum spectrum which caused difficulties for students in having comprehensive understanding on one learning material at SVHS. Otherwise, the instructional planning and conducting of learning materials were being conducted based on the principal's program. Teachers did not have the opportunity to develop their ideas.

Without putting a side other factors that causes the low improvement of teachers professional competence at SVHS in Medan, therefore the researcher considers the importance of having a research on the impact of ICT integration to improve teachers professional competence, from the perspective of independent learning motivation, innovative attitude and training.

Problems Statement

The problem statement of this research can be stated as follows:

1. To what extent the independent learning motivation, innovative attitude, and training impact directly toward ICT integration?
2. How independent learning motivation, innovative attitude, and training impact directly or indirectly toward the teacher professional competence?
3. How the ICT integration impact toward the improvement of teacher professional competence?
4. To what extent independent learning motivation, innovative attitude, training and ICT integration as a collaboration directly impact toward the teacher professional competence?

Review of Literature

According to DBE3 (2010:3-5) defines teacher professional competence covers three main dimensions, which are basic professional competence as the basic competence that teachers have to perform their function. Reflection and action competence are the competences owned by teachers in order to review what has been taught and what set of improvement that needs to be done to obtain the maximum result in the next teaching-learning process. Development competence refers to one set of effort in searching latest innovation in the objective to achieve the required competence, while the professional development aims to improve communication among the members of teachers in improving the teachers' responsibilities the duties of teaching including the management of the organization profession.

OECD (2001:84) said that ICT as a combination of manufacturing and services industries that captured transmit and display data and information electronically. While Anderson and Glen

(2003:15) explain that ICT is technologies that are used for accessing, gathering, manipulating and presenting or communicating information. The technology could include hardware, software applications, and connectivity. Aligned with this, Pernia (2008:13) says there are three dimensions of ICT integration to the teacher professional development they are knowledge, skill, and attitude.

Knowles (1970) in (Houde, 2006:90) in his theory about adult learning or andragogy develops two propositions in adults learning: (1) adults are aware of their learning needs and (2) adults direct themselves to learn. As the needs of adults are oriented to independent learning, so the driving force to learn for adults is dominated by the intrinsic motive that emerges from the inner personnel, although extrinsic motive is not less important to push the willingness to learn for the adults. In connection with the intrinsic and the extrinsic motive of Kamp (2011:12) identify the source of independent learning motivation which involves social relationship, external expectations, social welfare, personal advancement, escape/stimulation, and cognitive interest.

Innovative attitude is the accumulation of a person's behaviour which is related with the tendency to act on innovation, or as Jong, Kemp & Snel (2001:13) has defined that innovative attitude is the actual form of a person's ability to produce ideas and work with those ideas in developing the product, service, work process which in this case can be summarized as ICT integration. The criteria that is necessary to be reviewed is innovative attitude aligned with Kolbe & Kolbe (2009:66) explained as dynamynd hierarchy model covering Three Parts of Mind: Affection, Cognition, and action.

Hamalik (2001:10) defines "Training is a management function that should be continuously conducted in the attempt to develop resources in organization". Further more, the impact of training to people, Kirkpatrick (1994) had mentioned this in USOPM (2011:114-118) stated that this should be conducted effectively and in a comprehensive manner covering four dimensions that could evaluate the benefit of training. They are Reaction, Learning, Behaviour, and Result.

From the previously discussed theories, the ICT integration can be implemented if the teacher's character (independent learning motivation, innovative attitude and training) can be developed. It means that, a teacher who has been able to integrate ICT successfully will be motivated to continuously develop and find new things to the ICT integration. Mean that, those teachers will always improve the innovative attitude to every changes that will influence the improvement of professional competence.

Materials and Methodology

This research is a combination of descriptive research and causal relationship using the quantitative approach with ex post facto. The population of this research was 659 teachers of SVHS in Medan. Many of sample members were taken based on the Krejcie table (IPDET, 2007:8) with alpha 0.05 and the sample size of the total population were 243 teachers out of 659 teachers. The sample selection used proportionate stratified random sampling.

To find the causal relations of exogenous and endogenous variables in this research, path analysis was being wereutilized. Path analysis also supported the conceptualization of problems or complex hypothesis test of this research. The model used was structural equation model. Path analysis was used with consideration of normal correlation analysis would not be capable to fully explain as to how exogenous variables (X1,X2,X3,Y) impacts one on another or towards the improvement of teacher professional competence (Z).

Research Findings and Discussions

The result of basic descriptive analysis of this research can be presented in Table 1.

Table 1. The Basic Descriptive Analysis of Variabel (n=243)

Variabel	Mean	Avarage Ideal	Result
Independent Learning Motivation	185.80	150	Sufficient
Innovative Attitude	186.33	144	Sufficient
Training	187.37	150	Sufficient
Teacher Professional Competence	188.25	150	Sufficient
ICT Integration	189.47	150	Sufficient

The substructure-1 analysis was the analysis of the impact of exogenous variable of independent learning motivation, innovative attitude and training toward ICT integration as endogeneous variable. The X1 test toward Y resulted in path value of $\beta=0.701$, t value=14.644 with the $\text{sig}=0.000<0.05$ meaning that X1 has a significant contribution toward Y. The X2 test toward Y, resulted in path value of $\beta=0.162$, t value=3.754 and with the $\text{sig}=0.000<0.05$, meaning that X2 had a significant contribution towards Y. The X3 test toward Y resulted in the path value of $\beta=0.087$, t value=2.108, with the $\text{sig}=0.036<0.05$, meaning that X3 had a significant contribution towards Y.

The substructure-2 analysis was the analysis of the impact of exogenous variable of independent learning motivation, innovative attitude, training, and the ICT integration toward teacher professional competence as endogeneous variable. The X1, X2, X3 and Y test towards Z showed that the value of $F_{\text{count}}=297.690$ with the $\text{sig}=0.00<0.05$, meaning that exogenous variables X1,X2,X3 and Y had a significant contribution together on endogenous variable Z. How major is the impact could be known from the value of $R^2=0.838$ or 83.3 % of variable Z value was impacted by variable X1,X2,X3 and Y. Meanwhile the remaining of 16.7% was impacted by other variables outside this research with the total coefficient ($\rho_{2\varepsilon}$)=0.4086

The X1 test toward Z resulted in path value of $\beta=0.299$, t value=5.101 with the $\text{sig}=0.00<0.05$, meaning X1 had a significant contribution on variable Z. The X2 test toward Z resulted in path value of $\beta=0.142$, t value=3.598 with the $\text{sig}=0.00<0.05$, meaning that variable X2 had a significant contribution on variable Z. The X3 test toward Z resulted in path value of $\beta=0.095$, t value=2.570 with the $\text{sig}=0.011<0.05$, meaning that variable X3 had a significant contribution on

variable Z. The Y test toward Z resulted in path value of $\beta=0.458$, t value=7.787 with the $\text{sig}=0.011<0.05$, meaning that variable Y had a significant contribution toward variable Z.

The indirect impact of independent learning motivation (X1) toward teacher professional competence (Z) through ICT integration (Y) is 0.321. The indirect effect of innovative attitude variable (X2) toward teacher professional competence (Z) through ICT integration (Y) is 0.074. The indirect effect on training variable (X3) toward teacher professional competence (Z) through ICT integration (Y) is 0.321.

Thus, the overall impact of causal impact of exogenous variable X1,X2,X3,Y toward endogenous variables Z can be explained with the following structural model:

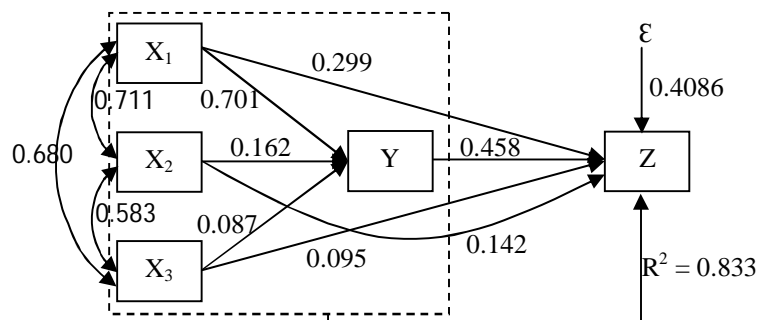


Figure 1. Empirical Causal Correlation Model Variables X1, X2, X3, and Y on Z

Conclusions

Based on the research findings of ICT integration toward improve teacher professional competence, it can be concluded that 49.14% of the ICT integration was determined by independent learning motivation; 2.62% by the innovative attitude; 0.76% by training. 8.94% of teacher professional competence was determined by independent learning motivation; 2.01% by innovative attitude, 0.90 by training, and 20.97% by ICT integration.

Furthermore, 10.30% of teacher professional competence is determined by independent learning motivation through ICT integration; 0.547% by innovative attitude through ICT integration; and 0.16% by trainings through ICT integration. Meanwhile teacher professional competence was determined by independent learning motivation, innovative attitude, training and ICT integration altogether is 83.30%.

Recommendations

Based on the research findings, key recommendations are as follows:

1. In the effort of improving SVHS teacher professional competence, it's necessary for the teacher to understand the importance of ICT integration in the teaching-learning process.

2. Teachers should always be able to conduct self improvisation towards the changes that occur in education either it is the national education reformation or global reformation that cannot be predicted earlier. Even so, the government and stakeholders in education should sustain their support to the teachers for them to be able to adopt those changes.
3. Trainings provided for the teachers should accommodate the current needs and demands aligned with the teaching materials potential and to be given to the teachers should be in accordance with the demand of the present needs and the potential of teaching materials and the students.
4. The government has the responsibility to control on the availability of ICT infrastructure for schools especially VHS/TVET of which in principles should have applied ICT in their work practice.

Reference

- Anderson, J. and Glen. A. (2003). *Building Capacity of Teachers*. Bangkok: Unesco
- Decentralized Basic Education-3. (2010). *Professionalism of Teaching*. Jakarta : DBE3
- Jong De, Kemp & Snel. (2001). *Determinants of Innovative Ability*. Zoetermeer: EIM Business
- Kamp Mathias. (2011). *Facilitation Skills And Methods Of Adult Education*. Kampala: Konrad-Adenauer-Stiftung
- Houde, Joseph. (2006). "Andragogy and Motivation". Paper Presented at *the Academy of Human Resource Development International Conference*, Columbus, OH, Feb 22-26
- Hamalik Oemar. (2001). *Teacher Training Based on Competence*. Jakarta: Bumi Aksara
- Kolbe Kathy & Kolbe David. (2009). *Leadership Analytics : The Science of Team Performance*. Scottsdale: Kolbe Corp.
- Organisation for Economic Co-operation and Development. (2001). *Technology and Industry Scoreboard*. France: OECD Publications Service
- Pernia Elena. (2008). *Strategy Framework for Promoting ICT Literacy*. Bangkok: Unesco
- United States Office of Personnel Management. (2011). *Training Evaluation Field Guide*. Washington: Executive Resources & Employee Development