

Determinants of Web-Based E-Training Model to Increase E-Training Effectiveness of Non-Formal Educators in Indonesia

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Abstract

The industrial revolution 4.0 era creates changes in all fields, including education with internet technology usage and the implementation. Electronic training (e-training) as a training medium is one aspect to achieve effective and efficient training goals for educators. This study purpose was to examine the web-based e-training determinant model to increase the e-training effectiveness of professional non-formal educators. It uses quantitative method with survey approach to 120 non formal educators who follow competence improvement training. Data was analyzed by confirmatory factor analysis and Structural Equation Modelling (SEM) using AMOS software. These study findings revealed that e-training model is more effective than face-to-face training. It is probed by the improvement of nonformal educator increase the professional competence. The SEM usage confirms that e-training providers leadership, e-training work climate, e-training learning methods and e-training principles learning indirectly have positive and significant effect on e-training effectiveness mediated by e-training implementation.

Keywords: e-training model, e-training effectiveness, non-formal educator competence

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I. INTRODUCTION

The industrial revolution 4.0 era has created many changes in human life. Marked by digital technology in field of knowledge and technology today, it needs competent human resources. Avoiding development of digital technology will creates human resources that primitive and isolated (Caputo, Cillo, Candelò, & Liu, 2019). The education change can be seen from face to face learning toward internet or online learning. The training by government institutions or private companies is done to improve the competence of educators, employees and companies in places where they work. Online training will make effective and efficient. In addition, it encourages educators to improve competence in accordance with development of knowledge and technology (Andayani, Prastiti, & Larasati, 2014).

The history of online education was started in 1960 at University of Illinois, Chicago, USA. They conducted lectures with a connected computer terminal system where students can access lecture material, and listed the recorded lectures (Peterson's, 2019). Furthermore, online education was conducted in Indonesia in 1999 by University of Indonesia by organizing a historical education system known as the Student Centered e-Learning Environment, well known as SCELE (Agus Setiawan, 2017). Along with times, E-Learning process as transformation in digital learning or training becomes more complex.

E-training is defined as a long-distance training process using Internet or Intranet, providing the knowledge needed for selected subjects or expertise to increase scientific level or to achieve rehabilitation, using computers, sound, video, multimedia, e-book, email, chat and discussion groups (Naoual Ben Amara, 2016). E-training is similar with e-learning in many ways, mainly thing in delivery method and technology usage, but e-training has shorter learning times that specifically designed to achieve specific learning or expertise. Based on this understanding, it can be concluded that e-training is electronic media for education and training activities in order to improve the skills and performance of participants in education and training.

The prime performance of Non-formal Educators can develop the potential of educators and students optimally, consistent with success of non-formal education units to make large contribution to improve of knowledge, attitudes, and skills of students in future. Non-formal educators are the key holders of future development human resources. They must master: (a) science and technology in according to globalization and transformation demands; and (b) a mature, solid and independent personality to reflects the true identity of true educators who have high dedication in developing future thinkers, heirs and future developers, namely non-formal education students.

The fulfilment of human resources in digital era can only be done if a nation has a good attention to world of education. Human resources are very important aspect for survival and development of a country. Human resources can master useful technology to do high quality education to produce high quality products. The technology sophistication level from education actors to do their work is largely determined by quality of the human resources. Education businesses must be able to take advantage of potential of technological advances for learning and development (Hewett, Becker, & Bish, 2019).

Law No. 13 year 2003, article 1 paragraph 9 on employment and training explained the training as the whole activity to give, to obtain, to improve and to develop work competencies, productivity, discipline, attitudes and work ethic at a certain level of skill and expertise in accordance with the levels and qualifications of positions and jobs. The existence of professional and dignified non-formal educators is an absolute requirement to create high quality education. The efforts to encourage the existence of professional educators in according to main task are continuously be trained to improve their competence. The contribution of skilled professionals in educational practice must be addressed in professional roles and positions, and how responsibility and accountability must be illustrated with many technology integration into professional services (Fenwick & Edwards, 2016).

Training can increases knowledge and skills and also develops talent. The analysis results found that training program correlated with higher professional competence (Amaluis, 2014). The center for development of early childhood education and people education in Central Java (PP-PAUD and Dikmas Central Java) are the Technical Implementation Unit of Ministry of Education and Culture with the task to implement the development of models and quality of education to increase the competence of non-formal educators. All components to achieve successful e-training with sustainable e-training have a significant positive effect. However, it does not rule out the possibility of ineffective and inefficient training. This is underlies the researchers to conduct research on Determinant of E-Training Model to increase the Competence of Non-formal Educators (PAUD-Dikmas) in Central Java, Indonesia.

II. METHODS

This study uses a quantitative approach with survey methods. The quantitative approach is carried out by obtaining empirical data to allows researchers to see general trends underlying a person's or group's behavior through numeric data analysis (Amaluis, 2014). Research with numbers or predicted is a quantitative approach (Sugiyono, 2013). There were 187 educators who participated in competency improvement e-training for non-formal educators (PAUD-Dikmas) in Central Java. The samples are determined by non-probability sampling with purposive sampling technique.

The sampling technique does not provide the same opportunity for each element or population to be chosen as a sample and to determine the sample with certain considerations (Creswell, 2014). The samples are determined by Isaac and Michel formula with a 5% error rate for 120 respondents (Isaac, S., & Michael, 1995). The estimation method of Maximum Likelihood (MC) requires a minimum sample of 100 and a maximum of 200 (Imam Ghozali, 2007). Data was obtained collected by questionnaires through Google Form. This study uses a five-point Likert scale instrument to measure attitudes, opinions and perceptions of a person or group of people about social phenomena (Johns, 2010).

This study has six variables, namely: exogenous variables, intervening variables and endogenous variables. There are four exogenous variables are e-training providers leadership, e-training work climate, e-training learning methods, and e-training learning principles. There are one intervening variables, namely the e-training model implementation and one endogenous variable, namely the e-training effectiveness.

The data analysis is analyzed by Structural Equation Modelling (SEM) using AMOS 24.0 statistical software. The first step to examine the measurement model and structural model on exogenous and endogenous variables uses confirmatory factor analysis (CFA). The indicators validity and reliability to measure of latent variables should have factor loading value ≥ 0.5 . The consistency of instrument measurement should have construct reliability ≥ 0.6 . SEM analysis is conducted by assessing the estimation of goodness of fit in research model and hypothesis (Ferdinand, 2002).

III. RESULTS AND DISCUSSION

Validity and Reliability Test

The analysis results for the validity test are shown in table 1.

Table 1. Validity and Reliability Test Result

Variables	Indicators	Standard Loading	Description	Construct Reliability	Variance extract	Description
E-training providers leadership	kp8	0.675	Valid	0.814727061	0.554618509	Reliable
	kp7	0.54	Valid			
	kp6	0.508	Valid			
	kp5	0.617	Valid			
	kp4	0.604	Valid			
	kp3	0.6	Valid			
	kp2	0.545	Valid			
	kp1	0.668	Valid			
E-training Climate	Workikp1	0.675	Valid	0.793590203	0.643046504	Reliable
	ikp2	0.562	Valid			
	ikp3	0.64	Valid			
	ikp4	0.655	Valid			
	ikp5	0.612	Valid			
	ikp6	0.603	Valid			
E-training Education Method	mp1	0.626	Valid	0.770827861	0.565878056	Reliable
	mp2	0.692	Valid			
	mp3	0.518	Valid			
	mp4	0.626	Valid			
	mp5	0.54	Valid			
	mp6	0.588	Valid			
E-training Learning Principles	Learningpb7	0.655	Valid	0.797684335	0.571318675	Reliable
	pb6	0.525	Valid			
	pb5	0.667	Valid			
	pb4	0.505	Valid			
	pb3	0.519	Valid			
	pb2	0.663	Valid			
	pb1	0.657	Valid			
E-Training Implementation Model	ime7	0.769	Valid	0.815766184	0.642535474	Reliable
	ime6	0.522	Valid			
	ime5	0.525	Valid			
	ime4	0.625	Valid			
	ime3	0.608	Valid			
	ime2	0.651	Valid			
	ime1	0.644	Valid			
E-training Effectiveness	kme9	0.674	Valid	0.875637468	0.786955582	Reliable
	kme8	0.663	Valid			
	kme7	0.688	Valid			
	kme6	0.643	Valid			
	kme5	0.629	Valid			
	kme4	0.591	Valid			
	kme3	0.689	Valid			
	kme2	0.772	Valid			
kme1	0.606	Valid				

Table 1 shows standardized loading factors to measure errors from each indicator has a value of ≥ 0.5 . It can be concluded that all variables can be explained from each indicator or valid.

Table 1 also explains that value of construct reliability is above ≥ 0.60 . It means that instrument is reliable. The value of variance extracted shows the construct fulfil the minimum cut-off value requirement of 0.50. It means that indicators used as observed variables can explain the latent variables. Variance Extracted value ≥ 0.05 indicates good convergence (Imam Ghozali, 2007).

Confirmatory Factors Analysis

The goodness of fit test results of confirmatory factor analysis for exogenous variables is shown in table 2.

Table 2. Feasibility Test Results for Exogenous Variable

<i>Goodness of Fit Index</i>	<i>Cut-off Value</i>	<i>Results</i>	<i>Model Evaluation</i>
χ^2 Chi- Square Statistik	df, $\alpha \leq 5\%$	532,116	Good
Probability	$\geq 0,05$	0,056	Good
CMIN/DF	$\leq 2,00$	1,617	Good
GFI	$\geq 0,90$	0,966	Good
AGFI	$\geq 0,90$	0,922	Good
TLI	$\geq 0,90$	0,970	Good
CFI	$\geq 0,90$	0,910	Good
RMSEA	$\leq 0,08$	0,079	Good

Table 2 shows the construct of research model has met the established goodness of fit criteria. The probability value of goodness of fit shows a value of 0.056. This value has met the feasibility testing and categorized as good even though there are some marginal testing values. Solimun (2002) stated that based on parsimony principle, the model has been declared fit if one or two fit criteria for model has been met. The endogenous variable test with confirmatory factor analysis test results for goodness of fit test is shown in table 3.

Table 3. Feasibility Test Results of Endogenous Variable

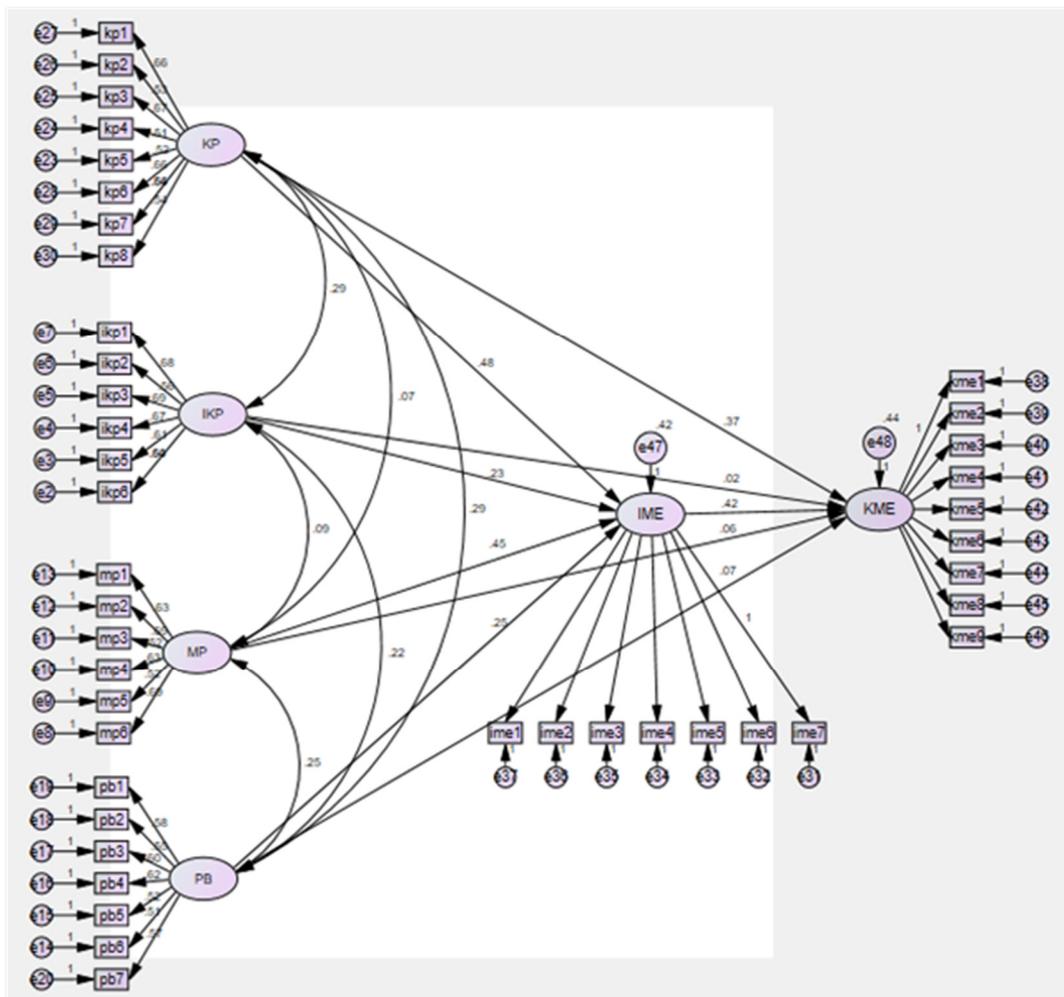
<i>Goodness of Fit Index</i>	<i>Cut-off Value</i>	<i>Results</i>	<i>Model Evaluation</i>
χ^2 Chi- Square Statistik	df, $\alpha \leq 5\%$	195.766	Good
Probability	≥ 0.05	0.052	Good
CMIN/DF	≤ 2.00	1.900	Good
GFI	≥ 0.90	0.930	Good
AGFI	≥ 0.90	0.873	Marginal
TLI	≥ 0.90	0.980	Good
CFI	≥ 0.90	0.928	Good
RMSEA	≤ 0.08	0.041	Good

Table 3 shows that the construct used in confirmatory factor analysis has met the goodness of fit criteria. The probability table on goodness of fit shows a value of 0.052. This value is categorized as marginal, so it can be concluded that model is acceptable and feasible to use.

The data assumptions in SEM modelling are normal multivariate, absence of multicollinearity or singularity and outliers. Imam Ghozali (2007) stated that Maximum Likelihood (ML) estimation technique is more efficient and unbiased if the assumption of multivariate normality is fulfilled, namely at Critical Ratio (CR) > 2.58). The data with normal multivariate data must be normal the univariate. On contrary, if the entire data is normal univariate, it is not a guarantee that it will be normal multivariate which outside the range ± 2.58 . The test results with a value of 1.724 indicate that research data used has met the normality of data. In other words, this data study has been distributed normally. In addition, covariance matrix determinant of sample value is 4.512. This value is far from zero, it means there are no multicollinearity and singularity problems. It has no multivariate outliers in data.

Analysis of Structural Equation Modelling (SEM)

Structural Equation Modelling (SEM) with full model is done after conducting confirmatory factor analysis on exogenous and endogenous variables. Figure 1 shows results of SEM analysis.



Description:

- KP = e-training provider leadership
- IKP = e-training work climate
- MP = e-training method
- PB = e-training principle
- IME = e-training Implementation
- KME = e-training Effectiveness

Figure 1. Results of Structural Equation Modelling (SEM)

The results of feasibility model test or the goodness of fit is shown in table 4.

Table 4. Goodness of Fit of the Model

<i>Goodness of Fit Index</i>	<i>Cut-off Value</i>	Results	Model Evaluation
X^2 Chi- Square Statistik	df. $\alpha \leq 5\%$	2094.356	Good
Probability	≥ 0.05	0.093	Good
CMIN/DF	≤ 2.00	1.843	Good
GFI	≥ 0.90	0.982	Good
AGFI	≥ 0.90	0.950	Good
TLI	≥ 0.90	0.942	Good
CFI	≥ 0.90	0.928	Good
RMSEA	≤ 0.08	0.002	Good

Table 4 shows that model used is acceptable at a significance level of 0.093. It indicates the structural equation model in good category. It means the feasibility test of SEM model has met the requirements.

The next step is hypotheses testing. All hypotheses testing are done by looking at value of Critical Ratio (C.R) of the relationship from SEM analysis, as shown in table 5.

Table 5. Hypotheses Testing of Each Variable

Description		<i>Std Estimate</i>	<i>Estimate</i>	<i>S.E</i>	<i>C.R</i>	<i>P</i>
E_training_implementation	← E-training_providers_leadership	.482	.588	.232	2.534	.011
E_training_implementation	← E_training_work_climate	.232	.759	.650	2.168	.043
E_training_implementation	← E-training_method	.451	1.029	.476	2.161	.031
E_training_implementation	← E_training_learning_principle	.251	.122	.558	2.219	.027
E-training_effectiveness	← E_Training_implementation	.417	.227	.085	2.664	.008
E-training_effectiveness	← E-training_providers_leadership	.371	.246	.124	2.987	.047
E-training_effectiveness	← E_training_work_Climate	.024	.043	.314	2.137	.021
E-training_effectiveness	← E-training_method	.058	.072	.197	2.368	.013
E-training_effectiveness	← E_training_learning_principle	.072	.093	.283	2.329	.042

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Estimation parameters to test the effect of organizer leadership on e-training effectiveness showed a C.R value of 2.987 with a probability of <0.05. It means the organizer leadership variable have a positive and significant effect on e-training effectiveness. Freifeld (2013) stated that leader role in training programs strengthen the participants' skills and knowledge, making participants more effective in strategy and execution.

Estimation parameters to test the effect of work climate in training on e-training effectiveness showed a C.R value of 2.137 with a probability of <0.05. It means the work climate variable has a positive and significant effect on e-training effectiveness. Neomi Kaplan-Mor, Chanan Glezer (2011) stated that ethical work climate is important because training that achieves excellence and high expectations through socially responsible behavior.

Estimation parameters to test the effect of e-training learning methods on e-training effectiveness showed a C.R value of 2.368 with probabilities <0.05. It means the e-training learning methods variable have a positive and significant effect on e-training effectiveness. Abdullah (2011) stated that the most important determinant in e-training method is to adjust the situation and conditions of all e-training components to achieve effective results. The type of e-training method chosen also depends on the program objectives and expected learning outcomes.

Estimation parameters to test the effect of learning principle on e-training effectiveness shows the value of C.R of 2.329 with probabilities <0.05. it means the learning principle variable has a positive and significant effect on e-training effectiveness. Poon Teng Fatt (1993) said that no e-training program can ignore learning needs. Fulfilling the demands of 1990s need a personalized training to harmonize the learning environment with learning styles of students. Creating the best trainee is not an easy task. This is a continuing challenge for trainers to meet the higher demands in future. Therefore, it can be concluded that with e-training, principle of good learning will increase the e-training effectiveness.

E-training model to increase the Competence of Non-formal Educators (PAUD-Dikmas) in Central Java

Estimation parameters to test effect of e-training providers leadership on e-training effectiveness through the e-training model implementations showed a C.R value of 2.534 with a probability value of 0.011 <0.05. So it can be concluded that e-training provider leadership indirectly has a positive and significant effect on e-training effectiveness mediated by e-training model implementation. Freifeld (2013) stated that leader's role in e-training programs to strengthen participants' skills and knowledge, makes participants more effective in strategy and execution. Therefore, it can be concluded that good e-training provider leadership in e-training will also increase the e-training effectiveness.

Estimation parameters to test the effect of work climate on e-training effectiveness through the e-training model implementations show a C.R value of 2.168 with a probability value of 0.043 <0.05. It means the work climate variable indirectly has a positive and significant effect on e-training effectiveness mediated by e-training model implementation. Anu Singh Lather (2009) stated that success of e-training program is determined from a work climate e-training perspective because it helps in achieving an effective e-training program. Therefore, it can be concluded that in e-training, good work climate e-training will also increase the e-training effectiveness.

Estimation parameters to test the effect of e-training learning methods on e-training effectiveness through the e-training model implementations show the value of C.R is 2.161 with a probability value of 0.031 <0.05. It means the variables e-training learning methods variable indirectly have a positive and significant effect on e-training effectiveness mediated by e-training model implementation. Neomi Kaplan-Mor, Chanan Glezer (2011) provided new insights on how an organization can utilize e-training methods effectively to achieve better operational excellence in training. Therefore, it can be concluded that with e-training, good e-training learning methods will increase the e-training effectiveness.

Estimation parameters to test the effect of learning principle on e-training effectiveness through the e-training model implementation show a C.R value of 2.219 with a probability value of 0.027 <0.05. It means the learning

principle indirectly has a positive and significant effect on e-training effectiveness mediated by e-training model implementation. Poon Teng Fatt (1993) said that no e-training program can ignore learning needs. In fulfilling the 1990s demands, all we need is personalized training based on learning environment of trainee. Creating best trainee is not an easy task. This is a continuing challenge for trainers to meet the higher demands in future. Therefore, principle of good learning will increase the e-training effectiveness.

The estimation parameter to test effect of e-training model implementation on e-training effectiveness shows a C.R value of 2.664 with a probability <0.05 . So it can be concluded that e-training model implementation has a positive and significant effect on e-training effectiveness. Ramayah, Ahmad, & Hong (2012) states that e-training has an effect on cost effectiveness, flexibility, comfort, consistency of content throughout the organization. This study offers valuable insights for top management and IT managers related to factors affecting the effectiveness of e-training. Organizations can recognize the benefits brought by e-training, namely cost effectiveness, flexibility, convenience, consistency of content throughout the organization. Many do not recognize the critical factors that influence the success of e-training implementation.

IV. CONCLUSION

This empirical study found that e-training model was more effective than face-to-face training based on an increase in professional competence of non-formal educators. The SEM procedures usage has confirmed that hypothetical model of leadership, e-training providers, work climate in e-training, e-training learning methods, e-training principles of e-training participants indirectly have a positive and significant effect on e-training effectiveness mediated by e-training implementation. The e-training model has the effect of attracting attention and giving rise to motivation of non-formal educators who take part in training to improve educator competence. This provides a strong justification that e-training model implementation variable not only stand as exogenous variables and as estimators of e-training effectiveness variables, but also as intervening variables to mediate the exogenous variables. This research should be replicated in other educational environments, as public and private formal education educators, so that e-training models can be developed to improve the professionalism of Indonesian educators to face competitive global world in future.

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