AN ANALYSIS OF INTERNET BASED INFORMATION TECHNOLOGY ADOPTION MODELING IN IMPROVING HUMAN RESOURCES QUALITY

(AN EMPIRICAL STUDY OF STUDENTS AND COLLEGE STUDENTS IN CENTRAL JAVA)

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ABSTRACT

The title of the research is "An analysis of internet based information technology modeling in improving human resources quality (an empirical study of students and college students in Central Java)". The objective of this research is to determine the structural connection model of internet based information technology adoption towards the human resources quality. The population and sample of this research is students and college students in Central Java Province. The methods used in this research are instruments test, descriptive analysis, path diagram model analysis and web based information system planning. The results show that; 1) the contributions of technology investment and top management support were the most dominant in the internet based information technology adoption, 2) the quality of learning media and teachers became a dominant factor in learning system development, 3) internet based information technology adoption affected the human resources quality significantly through the learning system, however, without the learning system the internet based information technology adoption did not affect the human resources quality significantly. Thus, the information technology adoption will be effective to improve the human resources quality if it is framed in a learning system framework, 4) e-learning based learning model had a significant direct effect to the human resources quality, 5) internet based learning system model, i.e. e-learning had more value than the other learning systems in building a more effective interaction between the teacher and the students. Students were able to make a discussion, do the task, answer any question in a test, access the learning material anytime without time and areal limit.

Keywords: information technology, learning system, human resources.

Introduction:
Background:

The use of internet is not a special or distinctive case for some particular circle, such as profession, society, education, and ages circle. Almost all of segments of society were already familiar with the internet. Concomitant with time development and modernization, internet becomes a necessary and fixed activity of human as a society member. Beside as a requirement in profession, knowledge development, news, and entertainment, surfing also becomes an alternative way for people to socialize as a social being. By having only a computer with a LAN connection or bandwith, someone can access the internet easily and freely for 24 hours non-stop a day in mostly all over the world. The internet ease people to get any information and data which cannot be found directly in the daily printed media. The main problem which is often found in education is a resources limitation, physical resources, human resources, as well as information technology based learning resources. Based on the data from National Education Ministry (*Kemendiknas*), there are 95% of Vocational Schools had have computers. However, there are less than 25% of Senior High Schools and 10% of Vocational Schools who were connencted to internet (Mohandas, 2003). According to the background above, the researher choose "An analysis of internet based information technology modeling in improving human resources quality (an empirical study of students and college students in Central Java)" as the title of the research.

Problem Formulation:

a) How is the structural model used to draw the relationship of internet based information technology adoption towards human resources quality?
b) Does an internet based information technology adoption have a significant effect to an iterative and qualified learning system which affects the improvement of human resources quality?
c) What is a good software prototype model to provide a qualified learning information?
d) How is the structural theorist model which describes e-learning prototype relationship toward the learning quality and which affects the human resoures quality?

Literature Review:
Learning System:

The characteristic of traditional learning system is that there is a meeting between the students and the teacher to conduct a teaching and learning process (Ali, 2006:167). This method is still being used nowadays in order to reach the main purpose of teaching and learning. However, this concept still faced some obstacles related to the limitation of place, location and time of the execution as there is an enhancement in teaching and learning activity. The friction of learning system paradigm is started to be visible in knowledge transfer process. Nowadays, the learning process tends to focus on the teaching process, content base, being abstract and it is only for certain group (in this process, the teaching tends to be passive). Along with the development of the knowledge and technology, the process of teaching starts change into the learning process, case base, being contextualize and it is not for certain group only. In such type of learning, the students are required to be more active by optimalizing the learning sources provided.

Internet based Information Technology (TI):

Internet is a set or computer network in the world. In this case, a computer that used to stand alone, nowadays it can be directly connected to the hosts or to others computers. The other definition of internet is all computer network in the world which cointains information and be a medium of data communication. Internet works at a certain protocol. The most populer internet aplication is called the website or the site.

E-learning (electronic-learning) concept:

The ILRT of Bristol University (Surjono, 2007:116) defines e-learning as the use of electronic technology for sending, supporting, and improving the teaching, learning and the assesment process. Udan and Weggen (in Suryono, 2007) call the e-learning as a part of a long-range learningwhile an online learning is a part of e-learning. Besides, the term of e-learning covers some aplications and some processes such as computer-based learning, web-based learning, virtual classroom, etc. Furthermore, an online learning is a part og technology based learning which utilized the internet resource, the internet, and the extranet. In addition, Rosenberg (in Surjono, 2007) defines the e-learning as the utilization of the intenet technology for distributing the learning material, so hat the students can be accessed in everywehere. In the middle of 1980, the long-range learning technology start to move to the computer network used for the teaching and learning process. (Farhad, 2001:118).

Methods:
Research Design:

The reseach design aplies the stuctural model with the causative approach which aims at examining the relationship of information technology adoption variable, learning system toward the human resources quality.

Variable Classification:

The oksogen variable in this research is the information technology adoption (X1), and the endogenous variable of this reasearh consists of learning system (Y1) and the human resources quality (Y2). The learning variable is a variable which is intervening/mediation relationship between the information technology adoption and human resources quality.

The Operational Definition of Structural Model Variable:

The indicators which includes to the exogenous variable are:
The information Technology Adoption (X1) consists of four indicators i.e. 1) the comprehensible level of TI (X_{11}), 2) the top of management support (X_{12}), 3) IT Investigation provided (X_{13}), 4) Governement Support (X_{14}), 5) TI Application and the Internet (X_{15})
The indicators which includes to endogenous variable are:
1) Learning system (Y1), consists of 6 indicators i.e. 1) Educators/ Lecturers Learning Behavour (X_{21}), 2) Behavioural and learning effect of Students (X_{22}), 3) Learning Climate (X_{25}), 6) The Quality Learning System Characteristic (X_{26})
2) The Human Resources Quality (Y_2) consists pf four indicators i.e. 1) Knowledge (Y_{21}), 2) Skilss (Y_{22}), 3) Behaviour (Y_{22})

Population, Sample, Simple size and Sample Selection Technique:

The researh population is all of Junior High Shool/ Junior High School/ Vacational High School students and university students in East Java. The population selection is based on some consideration i.e. 1) students are the biggest population who use the internet.

Instrument Test (Validation and Reliability):

The validation test aims at determining whether the indicators of the conceptual arrangement can measure something should be measured. The research applies the convergent validity which can be scored and the measurament model is developed by making sure that all estimated indicators are valid to measure the dimension and the tested concept.
The reliability test applies the construct reliability which is used to determine the internal existence of a construct indicators. So, the reliability shows the ability level of each indicator in identifiying construct phenomenon (latent factor). Construct reliability is scored by accounting the instrument reliability index used (composite reliability) from SEM model.

The data Collection Procedure:

The data were collected by using observation methode (observe the object directly) and by giving the questionnaire directly and undirectly (by mail). The data collection by using the questionnaire is by survey and mail survey where the researcher came to also sent the questionnaire to the research object i.e. to the schools and universities in the East Java.

Data Analysis Technique:
The descriptive Analysis Technique:

The data analysis by using the desccriptive statistic analysis is the Frequency distribution. Descriptive statistic was used to find out the respondent characteristics who have answered the questionnaire, for example, the respondents who are based on the sex. Descriptive statistic is also used to give the description of the characteristic of respondents' answers, for example the total of respondents who agree with the questionnaire statements.

SEM Model Analysis Technique:

The nect analysis uses the Structural Equation Modelling (SEM) by considering the test of causative relation structure between variables simultaneously and efficiently (Hair, 1998: 167).

Table 1.1: SEM Goodness of Fit Index

Goodness of fit index	Cut-off-Value	Note
Chi-*Square*	It is expected to have a small value	
Probability	≥ 0.05	
CMIN/DF	≤ 2.00	It is accepted if all of the cut-off value are completed.
GFI	≥ 0.90	
AGFI	≥ 0.90	
TLI	≥ 0.95	
CFI	≥ 0.95	
RMSEA	≤ 0.08	

Source : Hair *et al*., (1995:182), Ferdinand (2006:134)

System Design Analysis:

The system development methodology is methods, procedures, concepts, duties, regulations, and postulates which will be used to develop an information system (Jogiyanto: 2005). The researcher will used the some stages to develop the e learning software waterfall model in learning system.

Results:
Respondents General Description:

a) The total of respondents of the research is 203 respondents. There are 35,5% respondents who are high school students (Junior and Senior High School students), and the rest 64,5% of the respondents are college students.
b) The total of the studied educational institutions are 17 institutions. 8,33% of the institutions do not have a school website yet, and 91,5% of them have. The internet technology had been used broadly in most of the educational institutions in Central Java Province.
c) The role of the institutions in IT develompent can be shown by providing IT tool or facility, such as a Hotspot Area.
d) The result shows that there are 40.39% of the respondents have an access to internet in their campus/school, 10,84% for accessing in cybercafé, and 41,38% at home. It shows that internet has been assimilated in the society culture.
e) The result shows that 63,89% of schools and colleges do not have an e-learning website yet. It shows that most of schools and colleges do not optimize the implementation of e-learning system.

Instrument Test Result:

According to Sugiyono (2010: 89), dimension indicator shows a significant validity if it has a bigger Corrected Total Correlation than the product moment correlation value. The result of validity test shows that all of the indicators are valid.
The calculation of instruments realibility used Cronbach's Alpha formulation. The result shows that the *r* value which is more than the required *cut-off* value is 0,6. Thus, it shows that the instruments used by the researcher are reliable.

Descriptive Analysis Results:

a) The indicator of information technology adoption, with its highest average score by 4,15 refers to the indicator of IT application and Internet. It shows that the internet adoption depends on the ability of Internet application/practice.
b) The indicator of learning system, with its highest average score by 4,07 refers to the indicator of learning media quality. It shows that the learning system highly depends to the quality of learning media.
c) The indicator of human resources quality, with its highest average score by 3,97 refers to the indicator of knowledge. It shows that human resources quality highly depends on the knowledge level of the human resources.

Stuctural Model Test Results:

a) ConfirmatoryAnalysis of Exogenous Variable (Information Technology Adoption), shows that IT investment had the biggest contribution to the IT adoption. It shows that the

provision of IT investment, both hardware and software, had a dominant effect to the IT adoption level in students and college students.

b) Confirmatory Analysis of Endogenous Variable (Learning System, Human Resources Quality). Educators' behaviour and knowledge had the biggest contribution to the learning system and human resources quality. It shows that the educators gave a dominant effect to the learning system and the knowledge level of the learners.

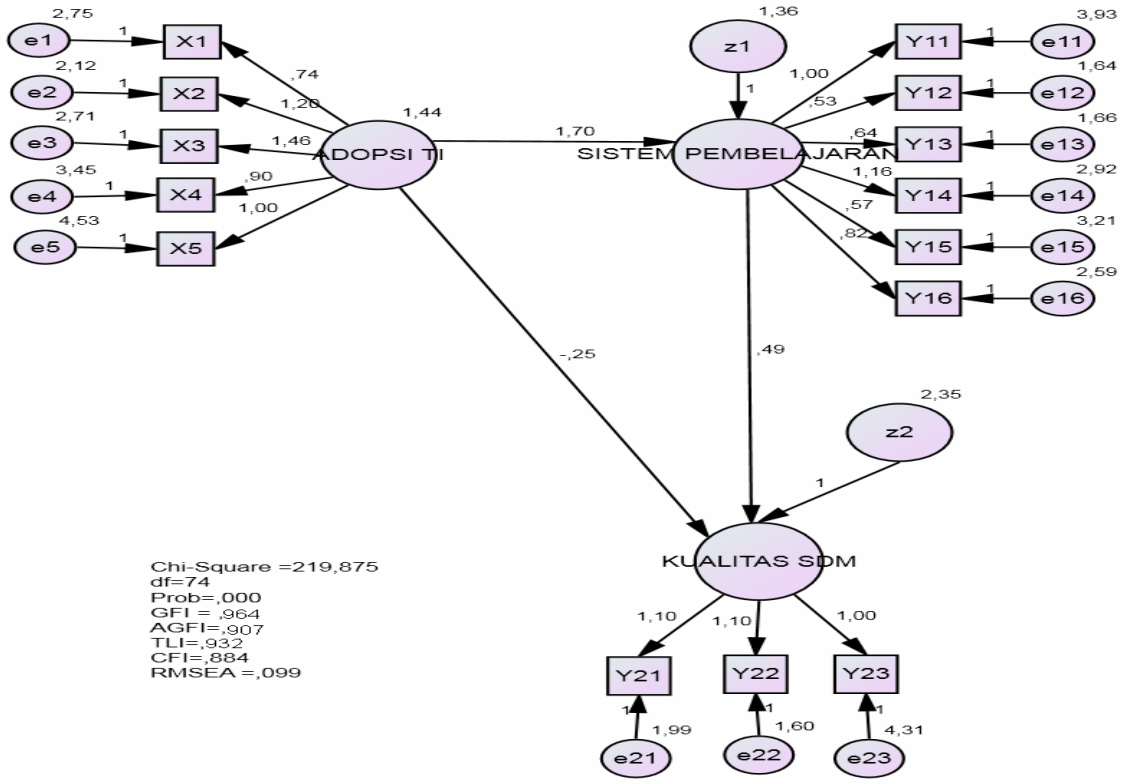
Evaluations of Structural Equation Modelling Assumption:

a) The outlier examination was conducted by implementing the *Mahalonobis distance squared* method. It shows that there is none of the observation number shows *Mahalonobis d-squared* score is lowest than the *Chi-Square* table score (α=0,001;df=74), i.e. 369.025. It means that there is none of the multivariate outlier symptoms found that means that the observation number is congregate in the centroid point.

b) The evaluation of the research data normality is needed to be conducted to detect the observation number behaviour symptomps before conducting the overall SEM model test. The result of the data normality shows that the mulitvariate CR score is 1,744. The score is in the range of -2,58 up to 2,58 as it was required. Thus, the data test shows that it is distributed normally.

Goodness of fit:

1) The Structural model of IT adoption relationship toward the human resources quality through the learning system.



Goodness of fit test through Structural Equation Model:

Criteria	Goodness of Fit	cut-off value	Evaluation Model
Chi-square	219,875	Sekecil-kecilnya	Insufficient
Probability	0,000	≥ 0.05	Insufficient
RMSEA	0,099	≤ 0.08	Insufficient
GFI	0,964	≥ 0.90	Good
AGFI	0,907	≥ 0.90	Good
TLI	0,932	≥ 0.90	Good
CFI	0,884	≥ 0.90	Insufficient

Source: Processed Primary Data of 2012

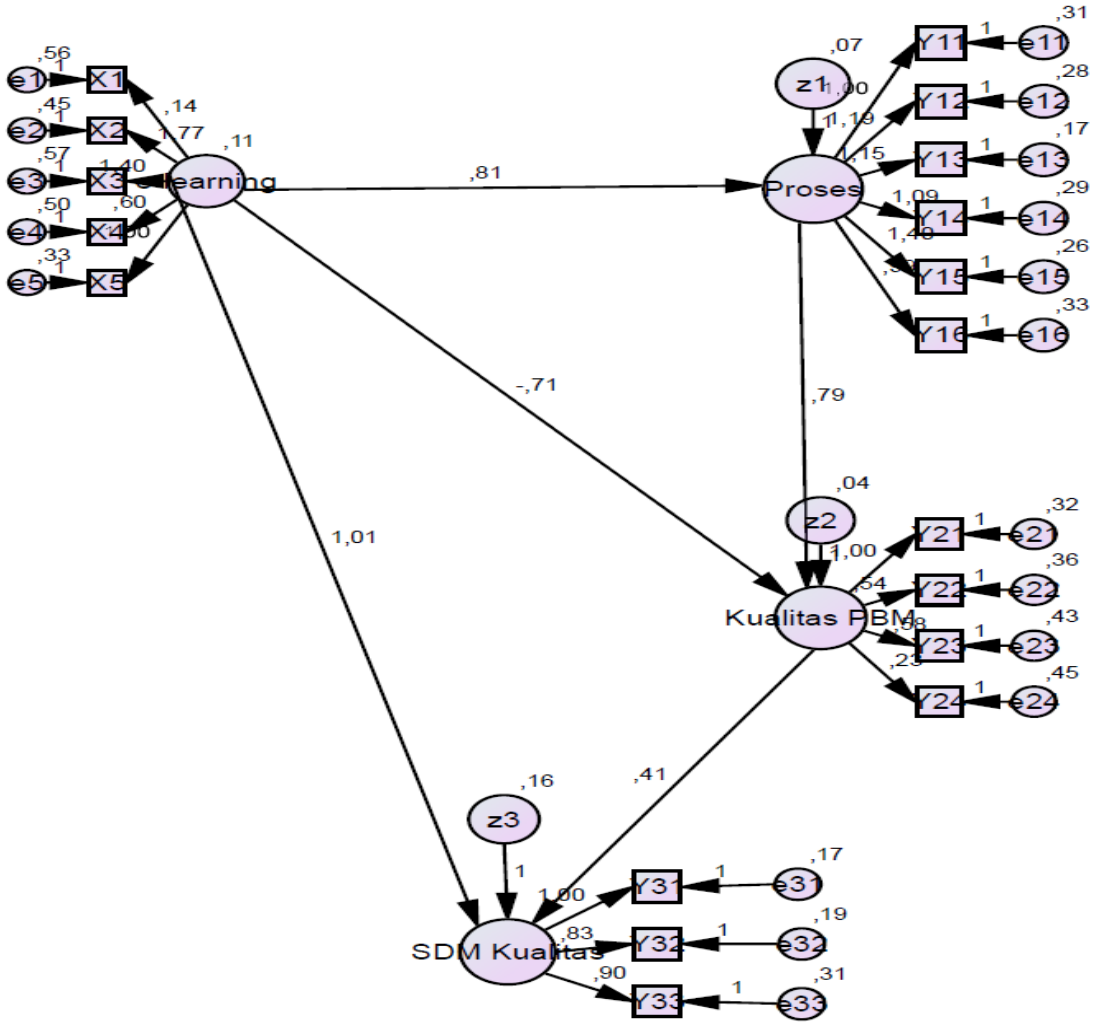
Structural Equation Result:

No	Endogenous Variable	Exogenous Variable	Koef-unstandardized	CR		T Table (α/2=0,025;df=203)	Prob		A	Note
1.	Learning System (Y1)	IT Adoption (X)	1,700	6,146	>	1,968	0,000	<	0,05	S
2.	Human Resources Quality (Y2)	IT Adoption (X)	-0,250	-0,704	<	-1,968	0,482	>	0,05	TS
		Learning System (Y1)	0,490	2,725	>	1,968	0,006	<	0,05	S

The Structural Model test of the relationship between IT adoption and human resources quality:

a) The structural model can be accepted as it fulfills the goodness of fit
b) The model shows that IT adoption had a significant effect to the learning system and human resources quality indirectly.
c) The model shows that the learning system played an effective role to the relationship between the internet based information technology and the quality of human resources.
d) The model directly shows that IT adoption did not affect the human resources quality significantly.

The Structural Model of the relationship between e-learning system and the human resources quality:



Goodness of fit test through Structural Equation Model:

Criteria	Goodness of Fit	cut-off value	Evaluation Model
Chi-square	207,757	At the smallest	Insufficient
Probability	0,000	≥ 0.05	Insufficient
RMSEA	0,076	≤ 0.08	Insufficient
GFI	0,925	≥ 0.90	Good
AGFI	0,869	≥ 0.90	Good
TLI	0,874	≥ 0.90	Good
CFI	0,908	≥ 0.90	Insufficient

Source: Processed Primary Data of 2013

Structural Equation Result:

No.	Endogenous Variable	Exogenous Variable	Koef-unstandardized	Prob		α	Note
1.	Learning Process (Y1)	E-learning Application (X)	0.814	0,000	<	0,05	S
2.	Learning Quality (Y2)	E-learning Application (X)	-0,706	0,223	>	0,05	TS
3.	Human Resouces Quality (Y3)	E-learning Application (X)	1,009	0,000	<	0,05	S
4.	Learning Quality (Y4)	Learning Process(Y1)	0,791	0,028	<	0,05	S
5.	Human Resouces Quality (Y3	Learning Quality (Y2)	0,414	0,239	>	0,05	TS

The Structural Model test of the relationship between e-learning and human resources quality:

a) The structural model can be accepted as it was fulfilled the goodness of fit.
b) The model shows that the e-learning application had a significant positive effect to the learning process but it had no significant effect to the learning quality.
c) The model shows that the e-learning application had a significant positive effect to the human resources quality.
d) These results show that the direct effect is bigger than the indirect one. It means that the learning process and quality were not effective enough as an invtervening in the relationship between the e-learning application and human resources quality.

A good prototype model of e-learning requires as follows:

1) Achievement motivation, 2) Attention to the explication, quality, and work accuracy of the tasks, 3) Being proactive, 4) Customer satisfaction oriented, i.e. students and college students,
5) Relationship establishment, 6) Other people development, 7) Directing ability, 8) Group working, 9) Group leading, 10) Analytical thought, 11) Conceptual thought,
12) Technical/professional/managerial skill. The result of the research shows that a good prototype model is a model which can improve the relationship beteween the educators and the learners.

E-learning prototype model:

The stages in arranging an e-learning prototype are: 1) Activity of study department / program choice, 2) Activity of subjects choice, 3) Activity of meeting choice, 4) Lectures contract signing, GBPP and SAP, 5) e-learning application setting, 6) the setting includes 3 preparations, i.e. hardware, software and brainware (operator), 6) Lecturing online preparation.

Discussion and Conclusions:

1. The contribution of the technology invesment, and top management support are the most dominant in the internet based information technology adoption.

2. The quality of learning media and educators are the dominant factors in the development of the learning system.
3. The internet based information technology adoption had a significant effect to the human resources quality through the learning system. However, if it did not through the learning system, the effect of the information technology adoption is not significant. Thus, it will be effective to improve the human resources quality if it is framed into a learning system framework.
4. E-learning based learning model had a significant direct effect to the human resources quality.
5. Internet based learning system model, i.e. e-learning, had more value than the conventional one in building the interaction between the teachers and the students more effectively. The communication could be conducted without any geographical area and time limitedness. The students could make a discussion, do their tasks, answer the question, and access the learning material anytime without time and areal limitedness.

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