

The Development Of Innovative Dick-Carey Training Model To Improve Biology Teachers Performance In Applying Ict At Public Senior High Schools In Semarang City

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Abstract

New atmosphere in school education needs severe teachers' performance so that they aren't out of date in applying ICT for the sake of education. The application of ICT in education will only be slogans and rhetoric if there is no serious and intensive effort. How about the teachers? Nobody will start except teachers. The research problems: (1) how is the development model of the public Senior High Schools teachers performance to apply the provided ICT? (2) How is the grand design of the developed training ICT? (3) How is the effectiveness of the development result-model?. The research findings: (1) There are two models of the public Senior High Schools teachers performance founding used at schools. They are from Educational Communication and Information Technology Development Board of Education Service and the Education Quality Certification Institution of Central Java province, which both models haven't conducted well-organized training yet, (2) The developed ICT training model design is the Innovative Dick-Carey (IDC) model which is developed by combining Dick-Carey, From the Educational Communication and Information Technology Development Board, and form the the Education Quality Certification Institution models, so that it has high value of effectiveness, (3) The final result is the IDC model whose the effectiveness has been proved. It is suggested that every school should provide educational infrastructures which can give more chances to ICT to be implemented in learning process.

Key words: Development, ICT, Innovative-Dick Carey, teachers' performance, training model.

INTRODUCTION

It's a dilemma, that at first, a side of education process at a certain education unit is expected to be interactive, inspired, fun, challenging, well-motivated to the students to actively participate and share opinion, creativity, and built the studying independence based on their talents, interest, physical and psychological

development. However, the learning process conducted by teachers nowadays is still exterminating the students' potencies. The learning process are going monotonously and boring instead of going as the initial expectation. Secondly, our education system is still far away from the touch of information and communication technology. There are lots of schools which have become the *clients* of ICT, but the question is; have they optimally applied it?. A common *syndrome* in our education system is "Smart enough to provide the equipment, but stutter in taking care and using it". Third, the paradigm of our education in schools is stagnant. Even though the education system has changed, from centralization to decentralization, the management system are still same as the previous ones. School leadership is like feudalist as a little affluent. The education operators, who serve, are now asking to be served. The education execution is still waiting for the orders from the leader, without any creativity or innovation. Schools get lots of equipment and facilities *dropping*, but they never want to study how to use those things. Therefore, it's not a weird thing that there are many of television subsidized program that was aim for accessing TV-education still stagnant at their places, even packed still. Fourth, teacher empowering program is still walking at its place. Digital era has come into all life aspects in this country. Virtual words can provide an up-date, exciting, and actual information. However, how many teachers have tried to access them in the sake of education? From this point, in this modern era, it's a big mistake if a teacher thinks that he is the only source of information.

In the writer's opinion, ICT can be optimized if the teachers as the front guard of our education system are literate of modern technology. The teachers are at least expected to be able to operate the ICT so that the students can *enjoy* the teaching media with full of emotion and outlook.

In line with ICT development, our government through the National Education Ministry insists on including ICT materials to the new curriculum; KTSP 2006 for all school levels, where the computer as a ICT major component, has a very urgent role and position in the school education system as a one of integrated learning media.

Based on the above description, it can be inferred the high inspiration of society and government spirit to increase the education quality in every school, level, major department, as written in vision, mission, and ICT purposes integrated in the

education processes. However, is that spirit has been followed by the schools and teachers readiness to implement ICT in their class activities? Besides, is there any qualified learning training and models to reach that aims?

From the problem background above, we can identify the research problem; How is the training model which is developed and its effectiveness?. Specifically, this research is aim to describe the training model which will be developed and its effectiveness in the effort of improving the teachers' performance in using ICT.

Theoretically, this research can obtain the detail information about the developed training model and its effectiveness in improving teachers performance in applying ICT. Practically, (1) this research result will be a recommendation for General Directory of Educational Human Resource and Education Quality Development; and General Directory of Primary and Secondary Education Management to improve the *Diklat* model in order to increase the teachers' competence, (2) The research result will be also a reference for Semarang Education Service in sub-district or city to implement ICT at the public Senior High Schools in Semarang area, (3) For the public Senior High Schools, the result will be a positive spirit to apply the application of ICT in the learning process as the government suggestion, and become a recommendation to provide the needed equipment such as: School website and blog development regulation to accommodate inspiration and expression of the school members, (4) for the principal and supervisor, the result will be a reference to train teachers to apply ICT, (5) For teachers, the result will open the new knowledge and add their practical skill in implementing ICT, (6) For students, the result will add their knowledge to access the *on-line* sources of study, so that they will find the broader and easier materials, (7) For the researcher, the result will be e very important experience to explore knowledge.

Education and Training which are shortened as “Diklat” morphologically derived from the word ”Education” and “Training”, which the “Education” itself has the following meaning:

System of training and instruction (especially of children and young people in schools, colleges, etc) designed to give knowledge and development skills; knowledge, abilities, and the development of characters and mental power that result such training: fields of study dealing how to teach (Oxford Advance Learners Dictionary, 1980:385)

On the other side, the word “training” based on Indonesian etymology means a process to train an activity or job (KBBI second edition, Balai Pustaka, 1989). In English, the word “training” comes from the word “train” which based on Oxford means *to bring (a person or animal) to a desired standard of efficiency, behavior, etc. by instruction and practice. (Oxford Advance Learner’s Dictionary, 1989: 1360)*. Gomes (1997) in Rusman (2006) recommended that *Diklat* is an effort to reform a certain job achievement which becomes his responsibility, which must be planned in a certain way in order to gain organization purposes and the workers as individual.

The success of Education institution in conducting a *Diklat* for its personnel must connected to the applied management so that in the practical level, the *Diklat* involves the management functions such as: planning, executing, supervising, and evaluating.

Based on Handoko (1999) in Wahira (2012:42), education management is a continuous process which is done by education institution by conducting its functional management, which has influential effort and supervising, so that all education organization performance can be achieved as the purposes. Mantja (2008) asserted that education management is a organizational management whose purpose to support the subject learning process and institutional. Education management laid down several management functions whose purposes to effect and define the education purposes.

Information and Communication Technology (ICT), based on Indonesian Wikipedia, Free Encyclopedia in http://id.wikipedia.org/wiki/Teknologi_Informasi_Komunikasi called as a big umbrella of terminology which includes all technical stuffs to process and convey information. ICT covers two aspects; information technology and communication technology.

Information technology includes all aspects related to process, the application of supporting tools, manipulation, and information processing. Whereas communication technology means all things related to all supporting tools to process and transfer the data from one hard ware to another one. From that reason, information technology and communication technology are two aspects that can’t be separated.

As a learning medium, ICT, in any case, can give additional value for the achievement of behavior change of the students as competed as the followings: (1)

there is a direct interaction between the user and individual study material, (2) it can improve the students' interest, (3) it can drive the students to have an independent and continuous study, (4) there is a *feedback* to the students' responses, (5) it can deal with the limit of class condition, room, time, and students' senses, and (6) it can avoid verbalism (Sheel& richey, 1994).

Simply, these are the benefits of ICT utilization in learning process, such as; (1) to present and demonstrate an audio record or video of activities, (2) for virtual experiment activity, (3) for virtual classes where the students are driven to study independently based on web, where the students will get *online* materials, task, and test.

RESEARCH MODEL

The research used *Research and Development* (R&D) method. In R&D, the researcher examines the object to get new product and then examines the effectiveness of that new product (Sugiyono, 2009:427). It used descriptive qualitative research because the research will describe objectively the facts in the implementation of ICT during the learning process in Semarang city.

The research was conducted at the public Senior High Schools in Semarang city. The subjects of the research are 16 biology teachers of the public Senior High Schools in Semarang city.

The data gathering technique used observation method and questionnaire (primary method) and documentation study as well as interview (supplementary method). The data analysis technique used presentage description and descriptive qualitative technique. The effectiveness test of developed model draft used *single one shot case study* experiment design (Sugiyono, 2009) and completed with t-test.

RESULTS AND DISCUSSION

Based on the data gained through questionnaires, observation and interviews with some competent parties such as principals, teachers, and laboratory assistants in some of the public Senior High Schools in Semarang city, the results can be described as follows:

- 1) There are two models of factual coaching on the public Senior High Schools teacher's performance in the filed. They are the model from the Educational

Communication and Information Technology Development Board, and form the the Education Quality Certification Institution models

2) The Educational Communication and Information Technology Development Board; and The Education Quality Certification Institution models can see the following charts for further.

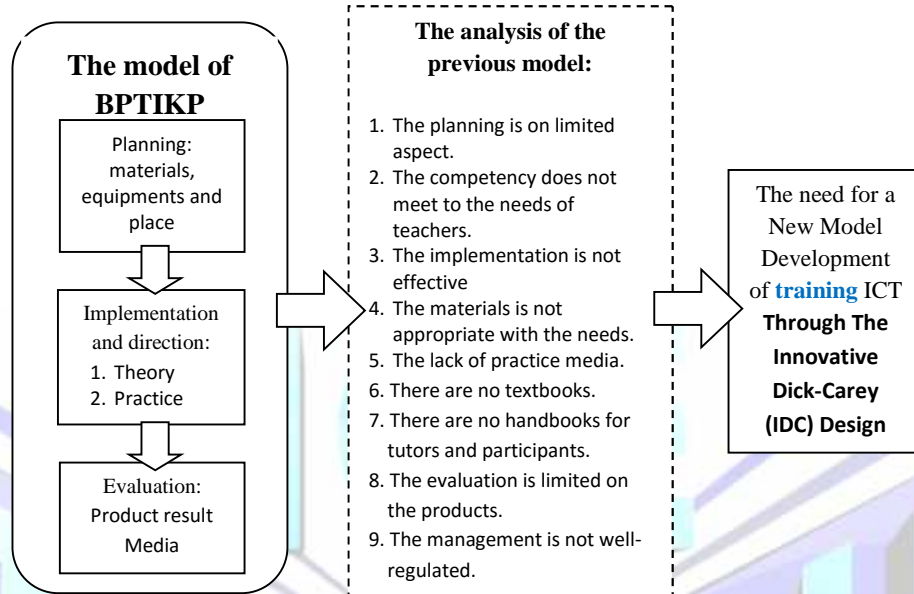


Chart 1: The Educational Communication and Information Technology Development Board Model, Central of Java Province

The Educational Communication and Information Technology Development Board Model still has a lot of weaknesses. They are (1) the planning is on limited aspect, (2) the competency does not meet the needs of teachers, (3) the implementation is not effective, (4) the materials is not appropriate with the needs, (5) the lack of practice media, (6) There are no textbooks, (7) there are no handbooks for tutors and participants, (8) the evaluation is limited on the products, (9) the management is not well-regulated. The Education Quality Certification Institution models, can be seen in the chart 2 below.

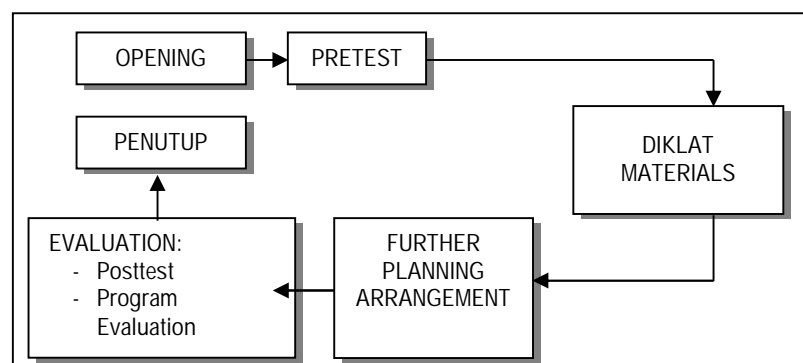


Chart 2: The Education Quality Certification Institution models

Source: Team of *Diklat LPMP*, Guidebook of *DiklatLPMP* (2012:6)

The Education Quality Certification Institution models still has a lot of weaknesses too. They are the management is not well-regulated, the planning is on limited aspect, the competency does not meet the needs of teachers, the materials is not appropriate with the needs, and so on. The theoretical model of Dick-Carey is as follow.

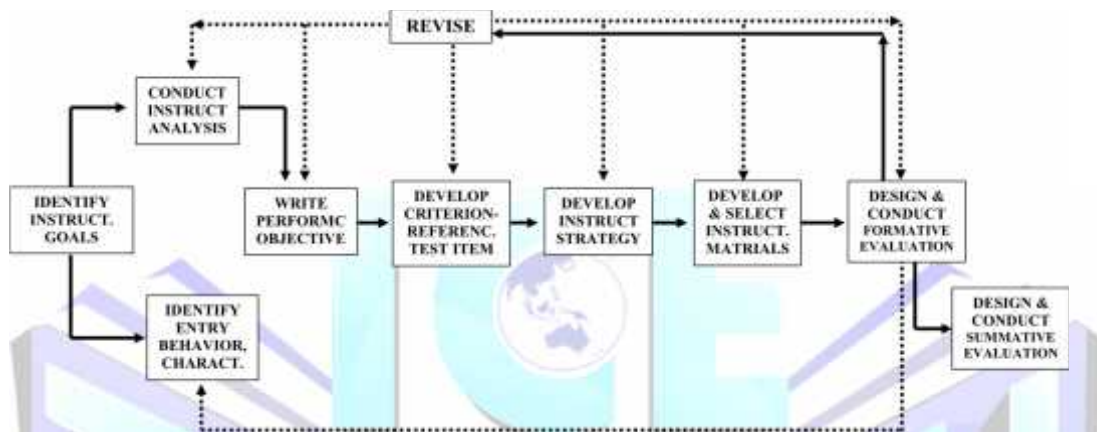


Chart 3: The Model of Dick-Carey, Source: Dick and Carey (1978)

Theoretical model of Dick - Carey is quite a lot of advantages. Among of them is the use of a system approach so that the process occurs in synergistic, systematic and systemic way. In developing this draft of ICT IDC model, the writer adopted for the planning steps. Hopefully, with these 9 internal steps and 1 external step, the planning process can be implemented more focused, goal orientated, and all the components work in synergistic way. Whereas, the integration of the two empirical models (from the Educational Communication and Information Technology Development Board and The Education Quality Certification Institution models, Central Java province) appears in the implementation and evaluation stages.

- 3) Through the standard of developmental research mechanism, it has successfully developed a draft of ICT training model called Innovative Dick-Carey (IDC). IDC is an integration of empirical models of the Educational Communication and Information Technology Development Board and The Education Quality Certification Institution, Central Java Province and also theoretical models of Dick -Carey, as shown in chart 4 below.

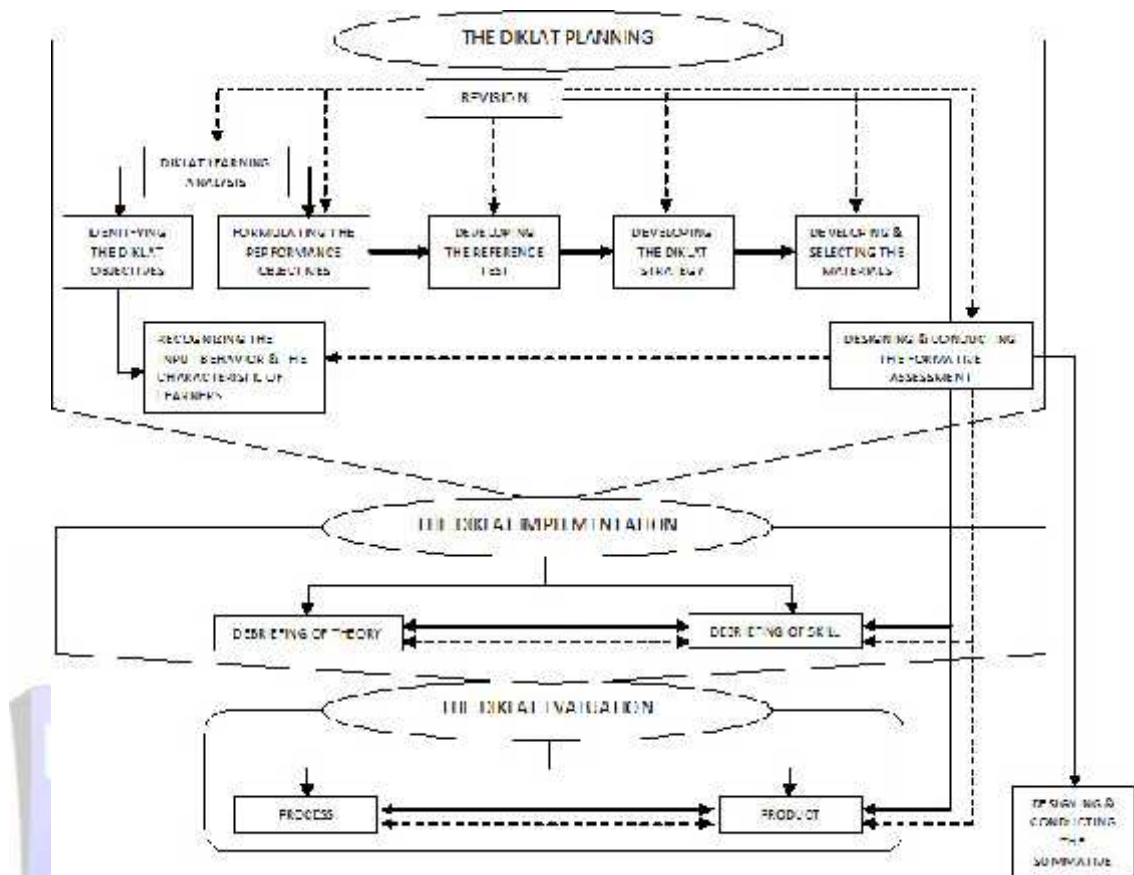


Chart 4: The Draft of ICT Training Model integrated with Innovative Dick-Carey (DCI)
 Source: Adapted from the design model of Kustiono (2012)

With the operational steps:

- a. The planning stage, including internal steps: (1) identifying the purpose of learning, (2) conducting the learning analysis based on the objectives, (3) recognizing the input behavior and the characteristics of learners, (4) formulating the performance objectives, (5) developing the reference benchmark test items, (6) strategy development, (7) developing and selecting the instructional materials, (8) designing and assessing with formative assessment, and (9) revising the development process.
- b. The implementation stage, including the following steps: (1) debriefing the theoretical materials of *Diklat*, and (2) debriefing the standard skills of training.
- c. The evaluation stage, including the following steps: (1) conducting a formative evaluation on the training implementation process, (2) conducting a formative evaluation on the products created in the internal training

processes, (3) following up to the outcomes of Diklat, and (4) conducting the summative evaluation on the products externally.

- 4) The effectiveness of the draft of ICT IDC training model can be described through the results of a limited test in order, including the test results of individual, small group, medium group, and broader group as shown in Table 1 below.

Table 1: The Score Calculation of the Effectiveness of ICT Implementation training with IDC Model on The Test of Individual, Small Group, Medium Group, and Broader Group

No	Testing Stages	Total Mean score/ Percentage	Qualification	Qualification Notes
1.	The test of individual	21,66 (88%)	VE/ VS	Very effective/ satisfying
2.	The test of small group	22,9 (86%)	VE/ VS	Very effective/ satisfying
3.	The test of medium group	23,3 (87%)	VE/ VS	Very effective/ satisfying
4.	The test of broader group	23,12 (87,5%)	VE/ VS	Very effective/ satisfying

From the table above, it can be stated that the total mean score of all assessment aspects and the four stages of test on ICT IDC training model are in very effective/ very satisfying qualification. Therefore, these aspects did not necessary any improvement. However, the training aspects related to teaching materials, textbooks training (TT), Guidebook training (GT), models training, evaluation and targets training, procedures and implementation training still need improvement because the results obtained were not maximum yet.

- 5) The effectiveness seen from the pretest and posttest through the four stages and t-test can be described in the table 2 below.

Table 2: The results of pretest, posttest and the t-test of ICT IDC Training Model on the Test of Individual, Small Group, Medium and Broader Group

Testing Stages	N	Pretest Mean Score (X ₁)	SD Sampel (s ₁)	Posttest Mean Score (X ₂)	SD Sampel (s ₂)	T _{account} Score	Df	T _{tabel}
The test of individual	3	66,7	42,35	84	28	-3,765	4	2,776
The test of small group	5	64,4	8,3	84,6	19,8	-8,52	8	2,306
The test of medium group	10	67	13,1	88,1	25,56	10,72	18	2,101
The test of broader group	14	68,43	15,96	89,29	28,374	11,717	26	2,056

Based on the pretest, the posttest and t-test results of the four test stages on the IDC model showed that: (1) the mean score of the posttest results is higher than the mean score of the pretest. On the other hand, it is 100 % above Minimal

Completeness Criteria (MCC). It means that that the IDC training model is able to influence positively on behavior change of the participants, (2) the mean score between pretest and posttest through the four stages is significant. It means that the implementation of ICT IDC training model is an effective way. It can be seen from the score of t_{account} is higher than t_{table} in the confidence and Df level.

- 6) The Test Result by the Expert Team. The team consists of management expert, ICT expert and media expert on various aspects of IDC training model in line with their skills. With some highly contributive recommendations to the development of the final IDC model, it can be stated that: (a) the quality of management training has reached the qualification score “effective” to “very effective”, (b) the quality of the program and schedule training has reached the qualification score “effective”, (c) the sufficiency of application software and the quality of materials training, textbooks and guidebooks (for instructors/ participants) has reached the average of qualification score until “very sufficient” level. The final model of IDC is an updating of the model draft which can be described in the following chart 5.

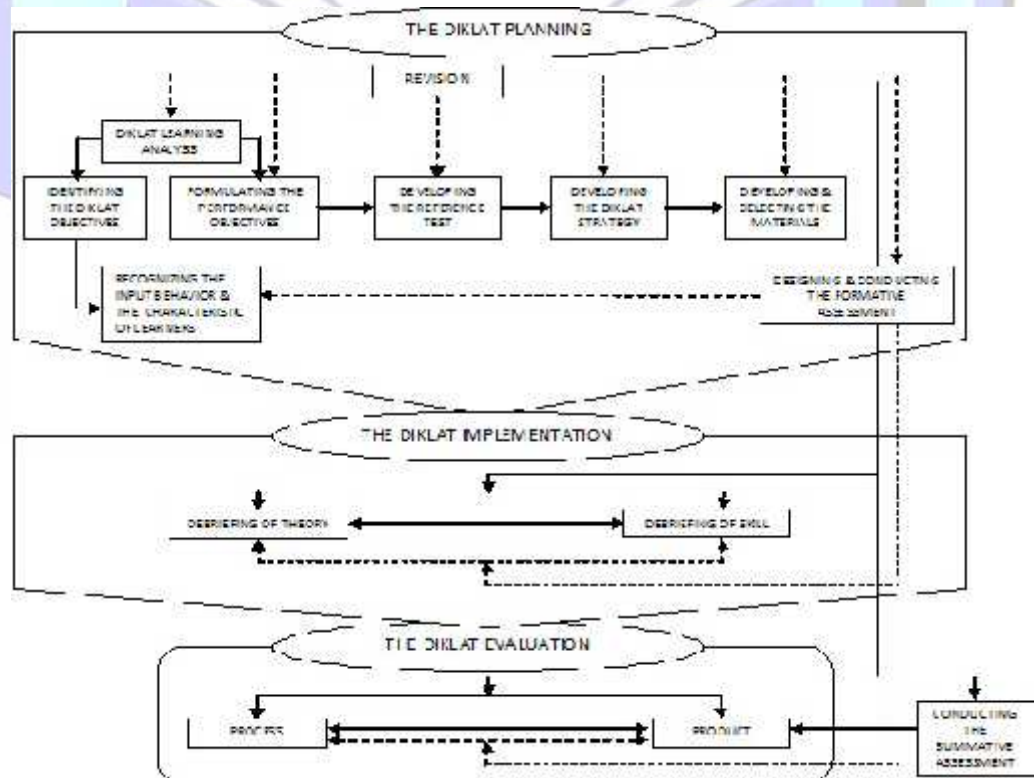


Chart 5: The Final Model of ICT Integrated Training with IDC
Source: Adapted from the Dick - Carey model and FGD Expert Team (2012)

Definitely, the steps are more applicable and systematic. They are:

1. The planning stage, including internal steps: (1) identifying the purpose of learning, (2) conducting the learning analysis based on the objectives, (3) recognizing the input behavior and the characteristics of learners, (4) formulating the performance objectives, (5) developing the reference benchmark test items, (6) strategy development, (7) developing and selecting the instructional materials, (8) designing and assessing with formative assessment, and (9) revising the development process.
2. The implementation stage, including the following steps: (1) conducting pretest and beginning the training activity, (2) debriefing the theoretical materials of training, and (3) debriefing the standard skills of *Diklat* and synchronizing to the theories, (4) conducting posttest as a formative evaluation in achieving competencies training at the end of training proses.
3. The evaluation stage, including the following steps: (1) conducting a formative evaluation on the implementation training process, (2) conducting a formative evaluation on the products created in the internal process of training, (3) following up the out comes by doing some revisions on the failure of activity process in each stage and improving the product quality at the end of the training, and (4) conducting the summative evaluation on the products externally.

CONCLUSIONS

- 1) With the development of mechanisms and standard testing process, the draft of ICT IDC model has been developed by combining the empirical models of the Educational Communication and Information Technology Development Board and The Education Quality Certification Institution models.
- 2) The Educational Communication and Information Technology Development Board and The Education Quality Certification Institution model, and the theoretical model of Dick-Carey which meet to the needs and based on the principles of effective management.
- 3) Through the limited testing, the broader testing, the test of expert and pretest-posttest, it showed that: (a) the final model of *Diklat* ICT IDC is able to influence positively on behavior changes of the participants, (b) There was a significant

difference in the mean score of pretest and posttest. It means that the implementation of final model of ICT IDC training is very effective.

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