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A Web-Based Portfolio Model as The Students' Final Assignment: Dealing with the Development of Higher Education Trend

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Abstract. This study aims to develop a web-based portfolio model. The model developed in this study could reveal the effectiveness of the new model in experiments conducted at research respondents in the department of curriculum and educational technology FIP Unnes. In particular, the further research objectives to be achieved through this development of research, namely: (1) Describing the process of implementing a portfolio in a web-based model; (2) Assessing the effectiveness of web-based portfolio model for the final task, especially in Web-Based Learning courses. This type of research is the development of research Borg and Gall (2008: 589) says *"educational research and development (R & D) is a process used to develop and validate educational production".* The series of research and development carried out starting with exploration and conceptual studies, followed by testing and evaluation, and also implementation. For the data analysis, the technique used is simple descriptive analysis, analysis of learning completeness, which then followed by prerequisite test for normality and homogeneity to do T - test. Based on the data analysis, it was concluded that: (1) a web-based portfolio model can be applied to learning process in higher education; (2) The effectiveness of web-based portfolio model with field data from the respondents of large group trial participants (field trial), the number of respondents who reached mastery learning (a score of 60 and above) were 24 people (92.3%) in which it indicates that the web-based portfolio model is effective. The conclusion of this study is that a web-based portfolio model is effective. The implications of the research development of this model, the next researcher is expected to be able to use the guideline of the development model based on the research that has already been conducted to be developed on other subjects.

INTRODUCTION

Indonesia needs human resources in sufficient quantity and quality as the main supporter in its development. To meet the needs of human resources, education has a very important role. Based on the function and purpose of national education, it is clear that education at every level must be organized systematically to achieve those goals. Based on several studies, it was found that a person's success is not determined solely by knowledge and technical abilities *(hard skills)*, but rather by the ability to manage themselves and others *(soft skills)* Cronin, M.W. & Cronin, K.A. J. Comput (1992 Only about 20 percent of success is determined by the hard skills and the remaining 80 percent is determined by the soft skills. Even the most successful people in the world can be succeeding more because of their soft skills than hard skill. This suggests that the quality of education of students is very important to be enhanced. Learning to follow the trend of the world is a learning that is flexible, accessible anywhere, and accommodates all the needs of teaching materials, even for the interaction which can be done online, Ritzhaupt (2008).

Based on the above ideas, higher education requires innovation in information technology which is related with learning. So that learning can be more meaningful or valuable, lecturers are able to use the methods that can foster creative ideas from students which resulting a meaningful portfolio product. This approach will help students to understand and discover knowledge in depth *(ultimate meaning)* by Anderson (2001).

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The purpose of this study is to develop a web-based portfolio model. This model can be used widely for learning, especially in higher education at the present time. The identified process and the effectiveness of the model can be used as reference for lecturers in applying the model into the learning.

FRAMEWORK OF THINKING

Web-based portfolio model is needed to support the teaching and learning process as expected by oner (2016). The need in lecturing process of higher education is quite high, the process of receiving lectures still needs a portfolio that is expected to improve the output quality of learning.

The majority of learning process applied in college today still use the conventional method and there is no web-based learning mode yet to be used in the learning proccess as a form of applying student portfolios. This is what makes students less motivated to follow the learning which is resulting the low product of practice-based courses. So that in the daily learning in school students only got the material transformation but not the learning experiences that are actually more meaningful. Through the portfolio, it is expected to perform experiment in order to understand the material more deeply and producing a product of web-based courses as the result.

Seeing such conditions, the researchers are developing an alternative way to resolve the problems of learning. The further action is designing appropriate final task model which is useful for students on an ongoing basis, so that students will be motivated to follow the learning from the beginning. As the result, the maximum success of learning can be achieved. Alternative learning model of the product portfolio will be developed into a portfolio model of students' final task. The portfolio model development is adapted from a model developed by Dick and Carrey, while the learning model is developed based on the development procedure adapted from development model byDick And Carrey according toBorg and Gall (2008).

RESEARCH METHOD

Research Approach

This study used the research and development approach. Borg and Gall (2008: 589) says "educational research and development (R & D) is a process used to develop and validate educational production". The series of research and development carried out starting with exploration and conceptual studies, followed by testing, evaluation, and implementation. The step of the second year onwards shall refer to the results of the previous step and so that it eventually gained a new educational product.

Data Source

The source of the research data include:

1. Informant, Lecturer of Curriculum and Educational Technology of Semarang State University and active college students.
2. Events, the events of the trial test process of the developed learning model.
3. Document, which is a type of written information, including syllabi, lesson plans, modules, teaching materials available, the model developed, and the data of the lecturers and learners.

Development Model

The researchers adopted a development model of Dick and Carrey because this model is appropriate to be applied to the development of learning media. As for the development phase, the researchers used stages presented by Borg and Borg, they are:

1. Identifying the learning common goal.
2. Carrying out the learning analysis.
3. Identifying the students behaviour of feedback and characteristics.
4. Formulating the performance goal.
5. Developing standard reference test items.
6. Developing learning strategy.

7. Developing and selecting learning material.
8. Designing and implementing formative evaluation.
9. Revising the learning material.
10. Designing and implementing summative evaluation.

Product Design

Product resulted from the web-based portfolio model which later will be tested on the learning of curriculum and educational technology students in two designs, namely:

1. The draft guidelines portfolio model for students
2. The draft guidelines model for the lecturers guidelines.

Research Procedure

Pada Basically, the steps of this research and development can be broadly summarized into three main steps. ***First,*** performing a preliminary study and exploration of learning in higher education today. In more detail this preliminary study include: (a) Describing the implementation of learning in general; (b) Describing the dependability of existing learning model with the results of research in the field of learning that includes portfolio; (c) Describing the obstacles that occur in the implementation of web-based portfolio model and the lecturers solution in overcoming the poblems (d) Describing the procedures of the web-based portfolio model development developed from this research. ***Second,*** describing the process of implementing a web-based portfolio model includes: (a) Describing the procedure of web-based portfolio model development; (b) Developing Semester Lesson Plan that was developed from a web-based portfolio model; (c) Developing teaching material developed from a model portfolio of web-based and (d) Identifying the advantages and disadvantages of web-based portfolio model developed from this study. ***Third,*** examining the effectiveness of web-based portfolio model including: (a) Analyzing the effectiveness of web-based portfolio model; (b) Analyzing the effectiveness of the teaching materials developed from web-based portfolio model and (c) Explaining the lecturers and students perception toward web-based portfolio model.

From the preliminary study developed a model draft as in Figure 1 below:

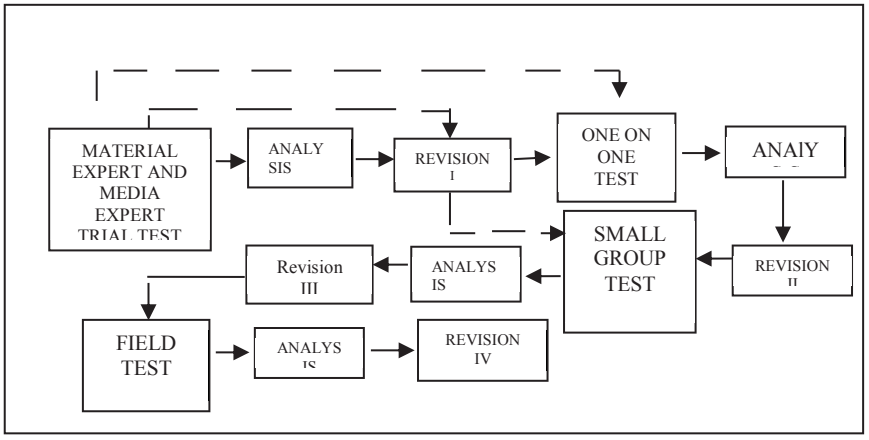

FIGURE 1. The plot of development procedure

RESEARCH RESULT

The objective of the initial research to make guidelines for the next research goal is to describe the process of implementing a web-based portfolio model which includes: (a) Describing the procedure of developing web-based portfolio model; (b) Developing a semester leasson plan developed from a web-based portfolio model; (c)

Developing teaching material developed from a web-based portfolio model and (d) Identifying the advantages and disadvantages of web-based portfolio model developed from this research.

PRELIMINARY DESIGN MODEL

1. Stages of Development Model

In accordance with the steps described in the previous chapter, this development stage of this model begins with a preliminary study. *Focus Group Discussion* becomes the first step in concluding the input, experts' feedback and evaluation from expert users.

In the initial design of the model, the researchers designed a learning device of web-based portfolio model as follows:

a. Stage of RPS Development

Based on preliminary research conducted by researchers before developing a web-based portfolio model, descriptive data about ongoing learning conditions has been obtained which then followed by performing the initial design draft of RPS.

In order to keep the implementation of the activities of teaching materials design implementation take place properly, RPS has been compiled. RPS format developed by the next researchers disclosed in the FGD with the experts consisting of three lecturers of web-based learning from Semarang State University. RPS components identified are graduate learning achievement, learning achievement courses, description of courses, weekly meetings, expected capability, the study material (Subject Matter), Learning methods, Time, Evaluation, Criteria / indicator, and Credits.

b. Stage of Teaching Material Development

Teaching materials developed contained learning materials which content is customized by the limitation rule in preparing the material on teaching materials.

c. Stage of Portfolio Guidelines Development

The development stage is based on RPS adopted as an initial guideline which includes the entire learning process. Through this learning process, the development of portfolio is delivered, producing a web-based learning portfolio as the product of the students' final task. The next researchers develop portfolio guidelines as supporting web-based learning courses. Components of the portfolio should already contain an animation, illustrations, video illustrations, creative text, and voice narration.

d. Stage of Portfolio Assessment Guidelines Making

Researchers developed portfolio assessment guidelines to calculate the students' achievement score in this model. The assessment method of the learning achievement uses an average score assessing guide..

2. Stages of Expert Evaluation

The evaluation stage is conducted by experts in their respective professions that can be justified as a professional. The evaluation stage is performed three times in line with the scale trials conducted in developing the web-based portfolio model. Here is a recapitulation of the evaluation of the expert *(expert judgment)*.

The expert evaluation result of the web-based portfolio model from the first to the third stage evaluation showing various developments. The first stage total average result is 3.6, the second stage total average is 3.69, the third stage total average is 4. Variation of the evaluation results are closely related to the differences of the number of respondents who gave the assessment, as well as the differences of the respondents' characteristics.

FIRST STAGE TEST RESULT (ONE ON ONE TEST)

After the experts validate the model, then it was tested for the first time to obtain data on students' understanding of the portfolio and students learning achievement data as follows:

1. Data results of students' understanding of the portfolio model in the first test

Data of the students' understanding in this study were obtained from a questionnaire distributed to the students. The questionnaire score data were grouped into two categories: high comprehension and low comprehension. The group was classified based on the average score of the students in the class. If the score is lower than the average, it would be classified to the low comprehension group, while if the score is higher than the average would be in the high comprehension group. By using these criteria, from 10 students consisting of 5 students of experimental group

and 5 students of a control group, there are 8 student achieved higher scores and the other two achieved lower scores than the average.

From the above table it can be seen that the group of students that used web-based portfolio model of learning in the experimental class, 4 out of 5 students got higher comprehension with a percentage of 80% and the rest 1 student got lower comprehension scores with a percentage of 20%. While in the control group, 3 out of 5 students got higher scores with a percentage of 60%, and the rest 2 students got lower comprehension scores with a percentage of 40%.

2. Data of the First Test Learning Achievement

Learning achievement data of the control group was based on the analysis of the learning achievement ie n = 5, the highest score = 60, the lowest score = 20, mean = 40, standard deviation = 15.81. Learning achievement data of the experimental group was based on the analysis of the Learning Achievement n = 5, the highest score = 75, the lowest score = 55, mean = 67, standard deviation = 7.5.

3. Data of Students Opinion Questionnaire

Based on analysis of student opinion questionnaire n = 10, choosing difficult answer = 2 students, choosing the easy answer = 1 student, the mean of control group = 24, the mean of experimental group = 31.4.

MODEL REVISION

Model revision was conducted as a result of the experts' validation process and initial trials by identifying the instruments submitted to the experts as well as the users of this model directly. Subsequently revision was done to correct the flaws of the model according to the advice written on the questionnaire.

SECOND TEST RESULT (LIMITED SCALE TEST)

Researchers conducted the second phase of testing to get information of the understanding of the portfolio and the Learning Achievement data, which is the material understanding achieved by the students after the revision and experts validation, some components of the instruments submitted to retrieve the data will be described below, report as follows:

1. The data results of students' understanding of the portfolio model in the second test

Comprehension scores data of the control group was taken from the analysis of the comprehension scores n = 15, the highest score = 125, the lowest score = 116, mean = 121.9 standard deviation = 2.57. Comprehension scores data of the experimental group was taken from the analysis of the comprehension scores n = 15, the highest score = 130, the lowest score = 122, mean = 126, standard deviation = 2.54.

2. Learning Achievement on the Second Test

Learning Achievement Data of the control group was taken from the analysis of the learning achievement n = 15, the highest score = 65, the lowest score = 20, mean = 43.3 standard deviation = 10.8. Learning Achievement data of the experimental group was taken from the analysis of the Learning Achievement n = 15, the highest score = 75, the lowest score = 40, mean = 60.3, standard deviation = 11.09.

THIRD TEST RESULT (BROAD SCALE TEST)

1. Data of Students Comprehension on Portfolio Model on the Third Test

Comprehension Scores Data of the control group was taken from the analysis of the comprehension scores n = 26, highest score = 125, the lowest score = 114, mean = 121.6 standard deviation = 2.9. Comprehension scores data of the experimental group was taken from the analysis of the comprehension scores n = 26, the highest score = 132, the lowest score = 122, mean = 126.4 standard deviation = 2,3.

2. Learning Achievement Data on the Third Test

Learning Achievement Data of the control group was taken from the analysis of the learning achievement n = 26, highest score = 65, the lowest score = 20, mean = 45 standard deviation = 10.1. Learning Achievement Data of the experimental group was taken from the analysis of the Learning Achievement n = 26, highest score = 80, the lowest score = 40, mean = 60.1 standard deviation = 10.8.

THE MODEL EFFECTIVENESS

1. Normality Test of Students Preliminary Capabilities

To test the normality of the initial capabilities of students using Kolmogorov-Smirnov test which details can be seen in the Table 1;

TABLE 1. Kolmogorov-Smirnov Normality Test

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
control	.136	26	.200*	.951	26	.247
ekxeriment	.141	26	.194	.939	26	.126

a. Lilliefors Significance Correction

*. This is a lower bound of the true significance.

According to the table of normality above it can be concluded that the *p-value* or significant of the control group = 0.200 and the *p-value* of the experimental group = 0.194, both *p-value* and significancy of the two groups are greater than α = 0.05. So Ho was accepted with the data conclusions that derived from a normally distributed population.

2. Homogeneity Test

To test the similarity of the initial capability value Levene's Test was used. The details can be seen in the Table 2;

TABLE 2. Homogeneity Initial Value

Test of Homogeneity of Variances			
Students learning achievement			
Levene Statistic	df1	df2	Sig.
.004	1	50	.948

Based on the above table it can be seen the value of Levene statistic 0.948 > from α = 0.05. It can be concluded that the two groups come from the same variant.

3. Model Effectiveness Model (T-test)

Learning Achievemnt Data of Web-based portfolio model trial test

To test the difference in student achievement scores between the control and experimental group, the T-test was used. The details can be seen in the Table 3;

TABLE 3. Paired Samples Test

Paired Samples Test								
	Paired Differences							
				95% Confidence Interval of the Difference				
	Mean	Std. Dev	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
NA_CONTROL NA_EXPERIMENT	-.687	7.172	1.2679	-.273	1.8985	-.542	31	.592

Based on Table 3 can be explained that the distribution of t with value $t_{1-\frac{1}{2}\alpha} = 2$ with dk=(26+26-2)=50 and significance level 5%. While the t-test calculation results obtained t = -0,592 so $-t_{1-\frac{1}{2}\alpha} < t < t_{1-\frac{1}{2}\alpha} = -2 < -0{,}592 < 2$. Thus can be concluded that Ho is accepted and there is no initial knowledge difference between the students of experimental group and the control group.

a. Learning Achievement Data of the Model Trial Test

In the implementation of the development of web-based portfolio model obtained *post-test* data scores between the control and the experimental group which was obtained after studying each treatment.

Berdasarkan Based on the score, the average post test scores of the control group was 45 and the average post test score of the experimental group was 60.1. The effectiveness of the web-based portfolio model can be seen by performing T-test. The T-test is used to see if there is a significant values difference achieved by the students who used and did not use the web-based model portfolio . T- test results data for the effectiveness web-based portfolio model is presented in Table 4.

TABLE 4. T-test Calculation Result for the Effectiveness of the Web-based Portfolio Model

Data	T_{count}	$t_{table\ (0.05:52)}$	Test Decision (H^o)
Web-based portfolio model	3.24	2.05	H^o rejected

Source: T-test Calculation Data

Tabel 4 shows that $t_{count} > t_{table\ (0.05:53)}$. So it can be concluded that there was a difference achievement between control and experiment group.

Based on the above analysis, it is concluded that there are differences in the average score of the *post-test* value of the group using web-based portfolio model which was higher (60.1) than the group that did not use the web-based portfolio model (45).

To see the effectiveness of the product, an analysis of student learning completeness was performed. Based on the analysis, from the students participating in a large group trial (field trial), the number of students who achieved mastery learning (a score of 60 and above) was 24 people (92.3%). It can be concluded that the use of web-based portfolio model in field trials already meet the category of "very good" and eligible to be used in web-based learning in FIP Unnes.

IMPROVING MODEL

After going through the process of development, started from the focus group discussion (FGD), the first test (one-on-one test), the second test (a limited scale test) to the trial stage III (broad scale test), and the web-based portfolion model has undergone a lot of revisions. Completion of the next model is performed after completing all of the tests; the test is complete if the Learing Achievement had been taken for the data to be analized. The revised web-based portfolio web refers to seven measures (Dick, Carey & Carey, 2009) and a learning step refers to Permendiknas No. 41, 2006 with the making of comprehensive learning syntax. This model produces products such as:

1. Learning Tool Component

Learning support in the form of web-based learning portfolio models components including: (a) RPS with attachments: problems summaries, questions item, answer sheets, (b) teaching materials of web-based learning media.

2. Collecting Data Instrument

Some instruments used in this study are a portfolio comprehension instruments, learning achievement test instruments, student opinion instrument, and expert validation instrument.

3. Learning Evaluation Model Guidelines

Based on inputs from several experts, evaluation guidelines outlined as follows. Guidelines for the evaluation become a part of the evaluation guide with scoring instrument label. Guidelines for scoring are generalized for all of

web-based portfolio model components. Simplification and generalisation of assessent standard are using basic mean total score, whether learning outcome score, components score and evaluation attachment as or the mean total scores obtained in the evaluation to determine the learning outcomes that is in the end of each meeting.

DISCUSSION OF THE MODEL (THE FINAL STUDY)

Web-based portfolio model in web-based learning is one instructional model that is quite simple in its execution, but the information revealed is complete enough, so it can be an alternative to be used for universities to apply this model on their web-based learning courses. Evaluation of web-based portfolio model has been tested qualitatively in which the result shows that the implementation of this model is quite practical, objective and efficient. The result of quantitative test using T-test analysis also shows that this web-based portfolio model is effective or appropriate to reveal the achievement of learning through web-based learning courses at the college level, because the model is statistically supported by field data, both in terms of the structural models and the measurement models. The web-based portfolio model is supported with the fairly brief but complete evaluation guideline, so this web-based portfolio model will more easily be implemented.

1. Characteristics of a web-based portfolio Model

There are several characteristics of a web-based portfolio model that differentiates it from other models. The characteristics are completely described below.

- The model is used for learning, especially on web-based learning courses.
- The use of this model does not depend on the context of the formal curriculum.
- The use of this model does not depend on any particular teaching approach implemented by the lecturer.
- The model improves the outcomes of the web-based learning comprehensively (evaluating process and also an output of web-based learning courses).
- This model can be used as a diagnostic evaluation to find and map the various aspects in the web-based learning course (the process and output) that needs to be improved.
- This model is open for further development.

2. The advantages of web-based portfolio Model

Compared with other models of learning, the web-based portfolio model has the following advantages.

- More comprehensive, because the object of evaluation is not limited to student learning output alone, but also includes an evaluation of the process of the web-based learning courses. Assessment of the output of web-based learning courses include an assessment of affective, cognitive and psychomotor obtained from the more complete evaluation especially of the web-based learning courses.
- This model is relatively simple in implementation without compromising the completeness of the information required in the learning activities.
- The use of web-based portfolio model is relatively less complex, so the implementation succes of this model in universities is quite high.
- This model can be used without being bound by a particular competence.
- This model is effectively used by colleges without disrupting the existing learning processes.
- This model supports the implementation of the college curriculum, especially the courses relate to the aim of the web-based learning courses in a well and fun way.

3. The Limitation of Web-based Portfolio Model

Web-based portfolio model, in addition of the advantages, it also lacks in some points as follows:

- The evaluation process has not involved an independent appraiser (independent appraisal) from the external party, for it is relying only on the internal assessment (internal appraisal) so the level of objectivity of the assessment results is likely to be less objective.
- Instruments of the indication aspects, the cognitive achievement test aspects, and the language aspects were not improving for these aspects were already available since the web-based learning courses exist.
- The feasibility test of the information of the output model has not been held. It means the information derived from the results data of the web-based portfolio model has not been tested empirically by the user or the beneficiaries of this model to be used as a basis for decision-making, policy formulation and either preparation of the next web-based learning course by the lecturers.

CONCLUSION

Research development of a web based portfolio model as students final assignment which is tested on the web-based learning course of Curriculum and Educational Technology Department, Semarang State University is done starting from the preparation of the design model, the development of a model for the learning process and learning output of Web-Based Learning, preparation of guidelines for the implementation model and the implementation model to determine the effectiveness of the developed model. Based on the analysis of data, this model can provide information for universities, either in terms of content, scope, format and the presentation timing. It also beneficial to the learning of Web-Based Learning at the college level. This model has two basic components: process and learning output of Web-Based Learning. The learning process of Web-Based Learning consists of four subcomponents, namely: a) the performance of Web-Based Learning Lecturer in the classroom, b) Web-Based Learning Lecturer personality, c) the behavior of students, and d) facilities, instructional media of Web-Based Learning. The learning output of Web-Based Learning includes three subcomponents, namely cognitive, affective, and psychomotor.

Based on the explanation in the previous paragraph, this model is able to be used as an alternative for the institution chief, Lecturer of Web-Based Learning courses, and institution to improve learning achievement in the output of the portfolio. This model can be further developed with the involvement of an independent appraiser, by integrating such assessments into the model. This model is very simple so the implication success by the user is quite high.

REFERENCES

1. Anderson, Lorin W., dkk. 2001. A Taxonomy for Learning Teaching and Assesseing: A Revesion of Bloom's Taxonomy of Educational Obectives. New York: Longman.
2. Borg and Gall. 2008. Eight Edition Educational Research : An Introduction. Pearson : Boston
3. Cronin, M.W. & Cronin, K.A. 1992. J. Comput. High. Educ. March. 3: 53.
4. Darmiyati Zuchdi. 2008. Humanisasi Pendidikan. Jakarta: Bumi Aksara
5. Daniel Muijs & David Reynolds. 2008. Effective Teaching: Teori dan Aplikasi. (Edisi Terjemahan oleh Helly Prajitno Soetjipto dan Sri Mulyatini Soetjipto). Yogyakarta: Pustaka Pelajar
6. Dick, Walter, Lau Carey, & James O. Carey. 2001. The Systematic Design of Instructions. New York: Longman.
7. Morison, Gary R., Steven M. Ross, Jerold E. Kemp. 2001. Designing Effective Instruction. New York: John Wiley & Sons, Inc.
8. Nunuk Suryani.2011. Implementasi Model Pembelajaran Kolaboratif Untuk Meningkatkan Ketrampilan Sosial Siswa.Jurnal Inovasi Pendidikan UNY
9. Oner, D. & Adadan, E. 2016. Journal of Computing in High Education August 2016, Volume 28, Issue 2, pp 236–260.
10. Permen 41 tahun 2006.
11. Ritzhaupt, A.D., Singh, O., Seyferth, T. et al. 2008 J. Comput. High. Educ. 19: 47 March 2008, Volume 19, Issue 2, pp 47–71
12. Roblyer, M.D., Jack Edward, dan Mary Anne Havriluk. 1997. Integrating Educational Technology into Teaching. New Jersey: Prentice-Hall.Inc.
13. Sudjana. 1996. Metoda Statistika. Tarsito. Bandung.
14. Toeti Soekamto dan Udin Saripuddin Winataputra.1996. Teori Belajar dan Model-Model Pembelajaran. Jakarta: Pusat Antar Universitas-Depdikbud.