Implementation of Interactive Multimedia-Based Learning To Creat ICT Literacy in Education of Computer Science Education Program FPMIPA UPI

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A b s t r a ct

Interactive multimedia-based learning is learning to use computer tools that can be combined with face to face activities. Interactive multimedia can improve learning effectiveness is no longer limited by space and time, anytime and anywhere as long as students have a computer device, the learning process can be done. This activity aims among others to give enlightenment to the world of education through the adaptation of information and communication technology in the learning that occurs accelerating the acquisition of information and learning quality improvement. The impact of this activity is expected to create technology-literate culture among the education community both faculty and students so as to enhance innovation and creativity of the parties involved in the learning college. Interactive multimedia identical with the institution's assets, and competencies of human resources. Renewal of competence can be done among others through interactive multimedia that competence is always giving business value through creativity and innovation of human resources. Competence development process can be carried out within a relatively short and covers a larger number. Interactive multimedia can be done from any location as long as he has a computer device, interactivity is possible independently and in complete visualization. To develop interactive multimedia, required human resources, infrastructure and training settings. Role or roles required in the implementation of interactive multimedia-based learning among others, lecturers and students. Lecturer role filling material, responding to student questions, and assess student work submitted. Students access the material act, discuss, and the tasks required. Infrastructure needed is not too complex includes both a desktop computer or laptop or computer lab. Implementation of interactive multimedia learning done in several stages that are user needs analysis, review multimedia software, software installation, operational training software, and maintenance. Implementation of learning activities will be performed in Education Study Program of Computer Science Education at FPMIPA UPI to Introduction Information and Communication Technology course with 4 (four) study groups. Preliminary results indicate a change in culture with ICT literacy. In learning to use interactive multimedia, there are several obstacles and supporters. Supporting factors such as students and lecturers are good with computers, the availability of computer facilities, high student interest, and a positive response to faculty using interactive multimedia. Inhibiting factor is the specification of a multimedia computer to play less than the maximum so that the interactive multimedia will be slow.

Keywords: *Interactive Multimedia, Information and Communication Technology.*

I. INTRODUCTION

1.1 Background

Many phenomena that occur in nature in the form of multimedia, but in the text books, such phenomenon was modified in a written form that must be changed again by the readers into mental images, it takes imagination, which sometimes felt difficult by students pesetas. Multimedia-based learning is learning to use a computer system equipped with audio, visual and kinetic (mouse). Concepts that are abstract, and difficult to observe that it is hard to reach learners pesetas imagination can appear more concrete and resembles the real world by using visualization.

1.2 Objectives and Targets

1.2.1 Objectives

In particular, this activity aims among others to the following. Packed full of interactive multimedia software for 4 (four) study groups.

  a. The installation of supporting software applications required to support interactive multimedia-based learning.
  b.   Disseminating software interactive multimedia-based learning at the faculty and students to interactive multimedia-based learning to walk.
  c. To evaluate learning outcomes with interactive multimedia.

1.2.2 Targets

Specifically target this activity among others to be as follows. Education Studies

  a. Program Computer Science has an alternative learning model that empowers ICT.
  b. Studies Program Computer Science Education has resources that can empower ICT as a means of modern pembelaajran.
  c. Education Studies Program Computer Science has a culture of modern learning through ICT empowerment.
  d. Education Studies Program Computer Science was able to develop more modern teaching models.
  e. Model learning system is easy to learn and use by lecturers and students. Learning facilities available that can be used anytime, anywhere and by anyone.

1.3 Research Problems

Problems of this activity can be translated into several sub-problems as follows.

  a. How to prepare a study into the community as a multimedia interactive ICT-based learning?
  b. How to prepare human resources for ICT to empower the learning tools?
  c. How did the implementation of interactive multimedia?
  d. How to guard the continuity of interactive multimedia learning?
  e. How the effectiveness of learning with interactive multimedia?

II. LITERATURE STUDY

2.1 Learning Theory

There are several theories put forward about learning, every theory has its own concepts or principles of learning that occurs in pesetas students, learning theory can be categorized to several sections, among others:

1. Theory of behavior (Behavioristic)

According to behavior theory approach, each of stimulation led to a response back. For example in computer-based learning, student interest pesetas to learning caused by the way of delivery of good teaching so that students pay attention pesetas. This theory assumes that students will perpetuate something action, if appropriate reassurance given to students.

2. Constructivism Theory

According to constructivism, learners peseta is no longer considered to be learned from what is given by the professor or the teaching system, but actively educate pesetas establish himself. Constructivism view learning as an active process that occurs in one in building knowledge significant in themselves through interaction with the environment by building linkages between knowledge and knowledge has been under study. Pesetas students "construct" (building) to check his own knowledge with new ideas and approaches based on knowledge and experience of previous students pesetas, apply them to new situations and to integrate new knowledge gained by students pesetas intellectual abilities that have been built before.

3. Cognitive Theory

Cognitive theories related to memory, namely long-term memory and short-term memory. This theory also supports the interactive learning, where students act actively acquiring, structuring and reviewing the knowledge to make it meaningful. To help students acquire knowledge, subject matter presented in the form of visualization that knowledge is better organized and easily understood. Some aspects of cognitive theory is very important in computer-based teaching. These aspects include: observation and penanggapan; memory; understanding active learning; motivation; transfer of learning and the differences between individuals. In order to improve the quality of education, one business can do is to understand how the students learn pesetas, among others:
a. What behaviors indicate that learning has taken place in pesetas educate yourself?
b. How information obtained from the environment is processed in the minds of students so that the peseta's pesetas and then pesetas educates students to develop?
c. How should the information is presented so that students can digest pesetas and remember longer educates pesetas in mind?

2.2 Media In Teaching Learning Process

Every person has different abilities in capturing the information communicated to him. Learning experiences that each person has a very varied, namely:
a. 10% of what is read,
b. 20% of what is heard,
c. 30% of what is seen,
d. 50% of what is seen and heard,
e. 70% of what is said,
f. 90% of what is said and done

From the above description, so that teaching and learning process can work well, students should be encouraged pesetas to utilize all the tools senses. Lecturers tried to display the stimulus (stimulus) that can be processed in various senses. The more sensory organs that are used to receive and process information the more likely the information is understood and retained in memory.

3.3 Computer-Based Interactive Learning

Multimedia is a tool that can create dynamic presentations and interactive graphics that combine text, animation, audio and video. Utilization of computers to create a combined text, graphics, audio, moving images (video and animation) by combining the link (relationship) and tools that allow users to navigate, interact, create and communicate. Multimedia Interactive (MMI) has several characteristics, among others:
a. Content representation (giving satisfaction);
b. Text combines graphics, animation, audio and video;
c. Full color and high resolution;
d. Response and reinforcement learning;
e. Developing principles of self-evaluation;
f. Can be used in classical or individual.

Computers serve as managers in the learning process known as the Computer-managed Instruction (CMI). Utilization of the computer as a teaching assistant in addition known as Computer-Assisted Instruction (CAI) or Computer-Assisted Learning (CAL) is a computer assisted learning as a guide (guide), for example, interactive CDs mathematics, Science, Physics, Biology, and others. While Computer Based Instruction (CBI) is learning to use computers as tools (tool). CAI was developed in several formats, including: tutorials, drill and practice, simulations, games, and discovery.
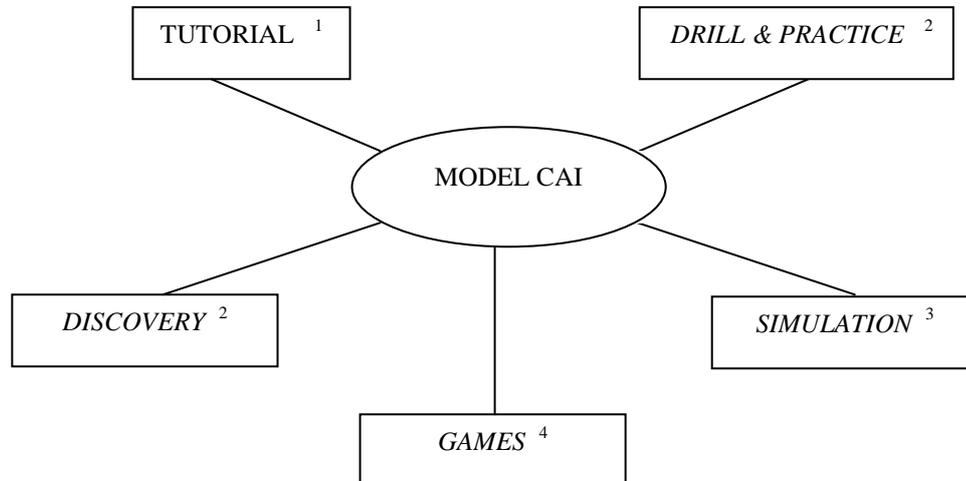

Figure : *Computer Assisted Instruction* (CAI) Model

a. Tutorial
Tutorial teaching program with computers based that imitate the tutor system conducted by professors or instructors. Information or messages presented in the form of a concept of a computer screen with text, pictures, or graphs.

b. Drill and Practice (Exercise)
Computer prepared a series of problems or questions similar to those commonly found in a book or work sheet workbook. One question asked and the answers given by students pesetas then assessed and analyzed and presented before the next question is displayed.

c. Simulation
Simulation program with the help of a computer trying to match the dynamic processes that occur in the real world.

d. Games Educatonal
Game program is well designed to motivate students pesetas, increase knowledge and skills.

III. METHODOLOGY
These activities will be implemented through the stages as follows.
3.1 Preparation
a. Need Assessment
b. Provision of CD learning package
c. Simulations using the CD package of learning

3.2 Implementation
a. Implementation study
b. Provision of learning tasks
c. Evaluation of learning outcomes

3.3 Monitoring and evaluation activities
a. Review and evaluation of interactive multimedia devices
b. Completion of interactive multimedia devices
c. Testing interactive multimedia devices that have been furnished

3.4 Analysis of the impact
a. Skil use the software.
b. The spirit of empowering technologies to support the study process.
c. Optimizing the learning time.
d. Technology-literate culture.

3.5 Reporting
a. Formulation of the report
b. Submission reports

3.6 Utilization Strategy
Here is a role or roles required in the implementation of interactive multimedia:

Table 3.1 Role and Function

Name Of Role	Actions
Lecture	• Designing learning • Filling material • Responding to a question • Evaluating tasks • Giving feedback • Evaluating the learning process
Student	• Following learning • Respond / actively participate; • Studying multimedia • Discussion • Sending tasks • Following evaluation

Infrastructure necessary for interactive multimedia systems can work well is as follows:

Table 3.2 Infrastructure

Kind	Spesification
Personal Computer	• Supports flash applications Capacity 512 MB (and can grow as needed plus)
LCD Projector	• Support presentations
Computer Lab	• Supports flash applications Capacity 512 MB (and can grow as needed plus)
Interactif Multimedia (MMI)	Content representation (giving satisfaction); • Text combines graphics, animation, audio and video; • Full color and high resolution; • Response and reinforcement learning; • Developing principles of self-evaluation; • Can be used in classical or individual.

IV. RESULTS

From the results of a preliminary study of 64 students obtained the following data:

A. Students

1. Students interest of introductory courses in information technology

Table 4.1 Students Against Interest introductory course

Student Interests	Frequencei	Persen (%)
a. Very Interesting	23	35.9
b. Interesting	24	37.5
c. Not interesting	2	3.1
d. Boring	15	23.4
Total	64	100.0

Table 4.2 Reasons Students introductory courses

Alasan Mahasiswa menyukai Mata kuliah Pengantar Teknologi Informasi dan Komunikasi	Frekuensi	Persen (%)
a. Interesting lecture	26	40.6
b. Introductory courses in information technology, many mamfaatnya	8	12.5
c. Challenged	25	39.1
d. Lecturer is good	5	7.8
e. Total	64	100.0

Table 4.3 Reasons Statistical Data Students are not introductory courses

Alasan Mahasiswa tidak menyukai Mata kuliah pengantar teknologi informasi	Frekuensi	Persen (%)
a. College hard	30	46.9
b. His lecturers keler	10	15.6
c. The courses a lot of practice	17	26.6
d. Learning boring	7	10.9
Total	64	100.0

2. Learning Method

Table 4.4 How to Study Students In introductory courses of information *technology*

Student learning strategy	Frekuensi	Persen (%)
a. Memorized	6	9.4
b. Practiced	48	75.0
c. Made note	0	0
d. Understood	10	15.6
Total	64	100.0

Table 4.5 Student Activities in learning

Student Activities	Frequence	Percent (%)
a. Listened to lecturers	12	18.8
b. Practicing	21	32.8
c. Reading books	10	15.6
d. Discussion	21	32.8
Total	64	100.0

Table 4.6 The use method by lecture

Methode	Frequence	Percent (%)
a. Demonstration	6	9.4
b. Discussion	10	15.6
c. Lecture	26	40.6
d. Experiment	22	34.4
Total	64	100.0

3. The Use of Learning Media

Table 4.7 Using Learning Media by Lecture

Learning Media	Frequence	Percent (%)
a. Yes, Always	20	31.3
b. No	24	37.5
c. Rarely	10	15.6
d. Often	10	15.6
Total	64	100.0

Table 4.8 Learning All Media Types Used

Types	Frequence	Percent (%)
a. Computer	58	90.6
b. Picture	4	6.3
c. Tools	0	0
d. Real Object	2	3.1
Total	64	100.0

4. Factors Inhibiting and Supporting

Table 4.9 Availability of computers at home

Availability	Frequence	Percent (%)
a. Very Adequate	18	28.1
b. Adequate	29	45.3
c. Inadequate	8	12.5
d. No facilities	9	14.1
Total	64	100.0

Table 4.10 The ability to use computers.

The ability to use computers	Frequence	Percent (%)
a. Very Good	11	17.2
b. Good	37	57.8
c. No Proficient	16	25.0
d. Can Not	0	0
Total	64	100.0

5. Student Resuls of Study

Table 4.11 Result of Study

Resuls	Frequence	Percent (%)
a. Very Good	16	25.0
b. Good	26	40.6
c. Quite	10	15.6
d. Less	12	18.8
Total	64	100.0

B. Lecture

1. Learning Preparation

Table 4.12 Learning Plan

Reasons	Frequence	Percent (%)
a. To assist in achieving goals	2	50.0
b. An obligation	2	50.0
c. Curriculum demands	0	0.0
d. For credit points	0	0,0
Total	4	100.0

Table 4.13 Resons of Learning Plan

Reasons	Frequence	Percent (%)
a. Media can be petrified students understand the concept of	1	25.0
b. Curriculum demands	3	75.0
c. It's a habit	0	0
d. Must exist in college plan	0	0
Total	4	100.0

2. Use of Methodology and Strategy

Table 4.14 Objectives of Learning Plan

Objectives	Frequence	Percent (%)
a. understand the concepts, principles and strategies	2	50.0
b. memorize lecture	0	0.0
c. answer the question correctly	0	0.0
d. can think creatively	2	50.0
Total	4	100.0

Table 4.15 The Use of Method

Methode	Frequence	Percent (%)
a. Demonstration	1	25.0
b. Discuss	2	50.0
c. Speech	0	0.0
d. Experiment	1	25.0
Total	4	100.0

3. Using of Learning Media
1) Student of Interest and Activities in Learning

Table 4.16 Interest of Multimedia Interactif Learning

Interest	Frequence	Percent (%)
Interesting	22	68.8
Quite Interesting	8	25.0
Uninteresting	2	6.3
Total	32	100.0

Table 4.17 Learning Use Interactif Multimedia

Interactif Multimedia	Frequence	Percent (%)
a. I am more active learning	21	65.6
b. I'm confused	8	25.0
c. I'm more passive	3	9.4
Total	32	100.0

2) Using The Media

Table 4.18 Difficulties Using The Media

Kesulitan menggunakan media	Frequence	Percent (%)
a. I feel no difficulty because the instructions clearly	19	59.4
b. I found it difficult because the instructions are not clear	4	12.5
c. I do not feel hard because they can use a computer	9	28.1
Total	32	100.0

3) Understanding Materials

Table 4.19 Understanding Materials

Pemahaman materi	Frequence	Percent (%)
a. Very Helpful	26	81.3
b. Help	6	18.8
c. Un Helpful		
Total	32	100.0

Table 4.20 Matter Understanding by Multimedia

Understanding	Frequence	Percent (%)
a. Knowing	30	93.8
b. Unknowing	1	3.1
c. Confused	1	3.1
Total	32	100.0

4) View of Media

Table 4.21 View of Media

Tampilan media	Frequence	Percent (%)
a. Well	13	40.6
b. Quite	13	40.6
c. Less	6	18.8
Total	32	100.0

Table 4.22 Multimedia Sound

Sound	Frequence	Percent (%)
a. Well	13	40.6
b. Quite	12	37.5
c. Less	7	21.9
Total	32	100.0

Table 4.23 Presentation of Matter

Presentation	Frequence	Percent (%)
Very Clear	15	46.9
Very Clear	16	50.0
Unclear	1	3.1
Total	32	100.0

5) Using of Media

Table 4.24 Presentation

Presentation	Frequence	Percent (%)
a. Well	2	50.0
b. Quite	2	50.0
Total	4	100.0

Table 4.25 Audio

Audio	Frequence	Percent (%)
a. Well	1	25.0
b. Quite	2	50.0
c. Less	1	25,.0
Total	4	100.0

V. CONCLUSIONS AND RECOMMENDATIONS
5.1 Conclusion
In learning to use interactive multimedia, there are several obstacles and supporters. Supporting factors such as students and lecturers are good with computers, the availability of computer facilities, high student interest, a positive response to faculty using interactive multimedia. Inhibiting factor is the specification of a multimedia computer to play less than the maximum so that the interactive multimedia will be slow.

5.2. Advice
Based on research results related to the benefits paktis peneltian, the author gives suggestions: For the faculty, should create interactive multimedia courses mostly done in the lab, The students should more actively seek other sources of learning that can enhance

understanding of course material, To the policy makers, the author suggests the existence of special attention for learning with multimedia developers by providing adequate facilities and faculty to facilitate menggembangkan and using interactive multimedia, and for researchers who will conduct research with a focus on the same problem, suggested researching and developing interactive multimedia courses other.

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Appendix: Snapshoot Interface MMI