The International Seminar on ICT for Education 2009
Yogyakarta State University, Indonesia
13 – 14 February 2009

THE DEVELOPMENT OF AN ADAPTIVE E-LEARNING SYSTEM BASED ON THE LEARNING STYLE DIVERSITY OF VISUAL-AUDITORY- KINESTHETIC

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OUTLINE

- ❑ **Background**
- ❑ **Adaptive Elearning**
- ❑ **Learning Styles**
- ❑ **Development Process**
- ❑ **System Preview**

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Background (1)

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- Empirical studies have shown that individual one-on-one tutoring is the most effective mode of teaching.
- Individual tutoring logistically and financially is impossible for all students in a traditional classroom situation.
- Many computer-based learning systems are available, but the instruction is not individualized to the student needs.

Background (2)

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- There are many e-learning systems, but they provide only the same materials to all students regardless of individual ability.
- The material is still oriented for on-campus homogeneous, well prepared and motivated students.
- However, the students may have very different goals, backgrounds, knowledge levels and learning capabilities.
- Current existing (conventional) e-learning may not fit to all students.

Adaptive e-learning systems (AES)
try to solve these problems by altering
the presentation of material to suit
each individual student

What is an adaptive e-learning system?

- □ AES is a combination of two technologies: intelligent tutoring systems (ITS) and hypermedia systems.

Intelligent Tutoring Systems (ITS)

Hypermedia Systems

Adaptive E-learning System (AES)
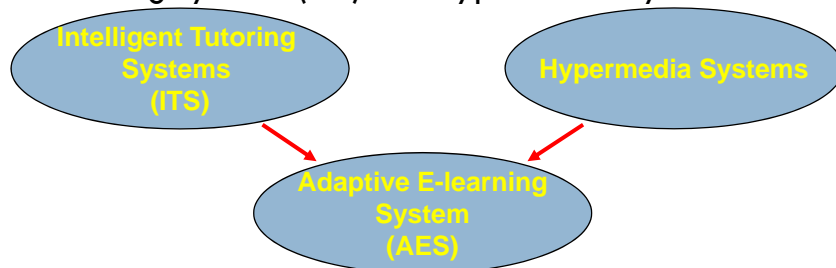
- □ ITS utilises a user model to adapt various visible aspect to particular user.
- □ Hypermedia contains information supported by different media and connected by links.

AES Definition

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□ AES can be defined as all hypertext and hypermedia systems that accommodate some student characteristics into a student model and apply this model to adapt various learning material presentations.

□ AES is used to enhance learning activity in web-based distance learning environment.

Compared to conventional e-learning

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□ AES overcomes some problems of conventional e-learning (web-based instruction), such as:

▪ providing the same information to all students, irrespective of student prior knowledge and learning style.

▪ assuming that all students have a homogenous ability and preference.

Compared to conventional e-learning

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❑ AES extends the advantages of conventional e-learning (web-based instruction) which are:

- classroom and
- platform independence

by offering learners personalised instruction in a distance learning setting.

❑ AES can minimize the "lost in space" problem when using conventional e-learning.

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Why students need AES?

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☐ Every student has different characteristics.

☐ The learning process is complex and is influenced by characteristics such as previous knowledge, learning styles, background, etc.

☐ Students need to use learning material and an order of presentation that depends upon their own characteristics and needs.

☐ AES has the capability to adapt a presentation to an individual's needs.

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Obtaining student characteristics

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- □ System initialises default values.
- □ System provides test to measure knowledge.
- □ System presents questionnaires.
- □ Students edit their own profiles.
- □ System captures the student's navigation history

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Definition of Learning Styles

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- □ The way a student prefers to learn (Bennet, 1979).
- □ The complex manner in which learners most efficiently and most effectively perceive, process, store and recall what they are trying to learn (James and Blank, 1993).
- □ The attitudes and behaviours which determine an individual's preferred way of learning (Honey and Mumford,1992).

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Learning Styles

Preference	Description	Recommended Representation
Auditory	Preference to listen to instructional content	PowerPoint-style presentations with synchronous audio
Visual	Preference to perceive materials as pictures	Diagrams, illustrations, graphs, flowcharts, animations
Kinesthetic	Preference to interact physically with learning material	Interactive multimedia elements: puzzles, drag & drop, fill-ins, small games

Learning Styles

Preference	Description	Recommended Representation
Sequential	Step by step logically to present material, outline the material in order	• Step by step to present material • Constrict links
Global	Large picture before detail, large jump, context of the subject	• Give big picture of the course • Provide all the links

Learning Mode

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- ☐ Visual – Global
- ☐ Auditory – Global
- ☐ Kinesthetic – Global
- ☐ Visual – Sequential
- ☐ Auditory – Sequential
- ☐ Kinesthetic – Sequential

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Development Process

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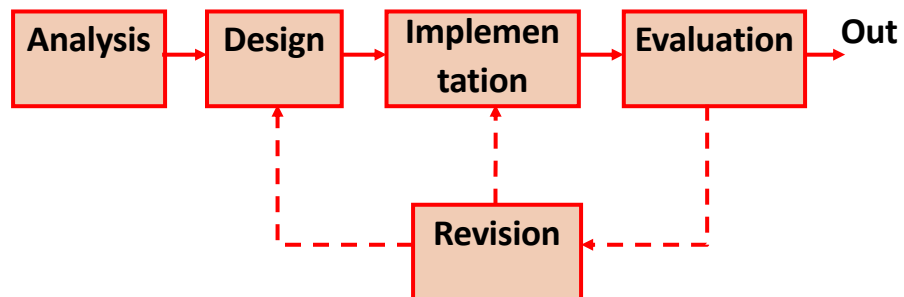
Analysis → Design → Implementation → Evaluation → Out

Revision

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System Analysis

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- ☐ The final product of this development would be a model of adaptive e-learning system based on the student's learning styles diversity.
- ☐ The system will identify the student's learning styles tendency through a set of questionnaire.
- ☐ The questionnaire scores will be used by the system as a basis to provide the student a presentation of learning materials differently.
- ☐ The possibilities of learning mode are visual, auditory, and kinesthetic combined with sequential and global.

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Architecture of the AES

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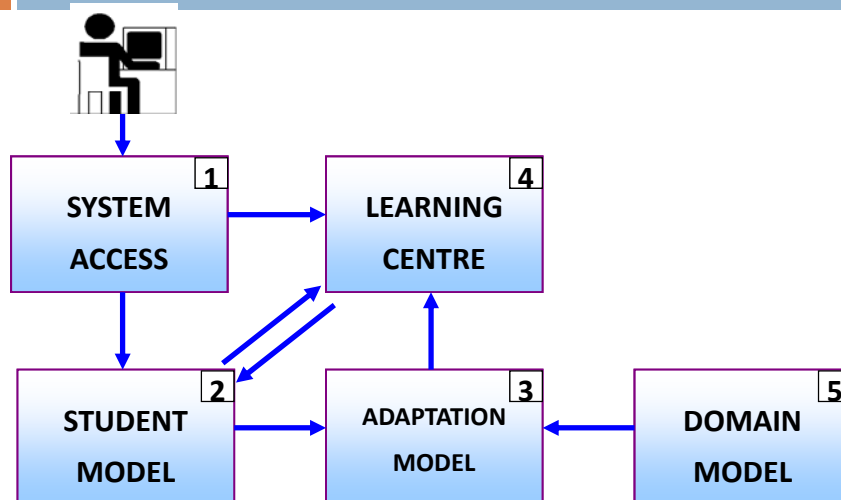
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Implementation using LMS of Moodle

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☐ Customizing Moodle

◻ Blocks
- blocks
  - adaptive
  - adaptive_activity_modules
  - adaptive_calendar_upcoming
  - adaptive_recent_activity

◻ Course Format
- course
  - format

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Implementation using LMS of Moodle

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☐ Customizing Moodle

◻ Modul

- mod
  - assignment
    - adaptive
  - chat
  - choice
  - data
  - forum
  - glossary
  - hotpot
  - journal
  - label
  - lesson
  - quiz
    - adaptive
  - resource
    - adaptive

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Teacher View

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Format ⓘ	Adaptive format ▾
Number of weeks/topics	7 ▾
Course start date ⓘ	10 ▾ January ▾ 2009 ▾
Hidden sections ⓘ	Hidden sections are shown in collapsed form ▾
News items to show ⓘ	5 ▾

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Teacher View

1 ✍ |Common| ➕|

📄 **Materi umum** → ⬍ ✍ ✕ 👁
ⓘ Add a resource... ▾ ⓘ Add an a...

2 ✍ |Visual - Global| ➕

📄 **Materi Visual-Global** → ⬍ ✍ ✕ 👁
ⓘ Add a resource... ▾ ⓘ Add an a...

3 ✍ |Auditory - Global| **Change style** Close
Common
Visual - Global
📄 **Materi Auditory Glob** Auditory - Global
Kinaesthetic - Global
▾ ⓘ Add an a...
Visual - Sequential
Auditory - Sequential
4 ✍ |Kinaesthetic - Glob Kinaesthetic -
Sequential
📄 **Materi Kinestetik Glo**
▾ ⓘ Add an a...

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Teacher View

Teacher View

Adaptive Learning Settings

Settings

Quiz Score Limit | 5 |

Save changes

List of Styles

- Style Group 1
    - Visual
    - Auditory
    - Kinaesthetic
- Style Group 2
    - Global
    - Sequential

Student View

Adaptive 3

You are logged in as Herman Student (Logout)

Adaptive ▶ CF101 ▶ Questionnaire

Questionnaire Completed

Result

Style Group 1

Visual	: 0
Auditory	: 2
Kinaesthetic	: 1

Style Group 2

Global	: 2
Sequential	: 0

Due to your questionnaire result, you will take this course in **Auditory - Global** format.

[>>]

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Student View

Adaptive 3

You are logged in as Herman Student (Logout)

Adaptive ▶ CF101

People ⊟
🔳 Participants

Activities ⊟
🔳 Forums
☑ Quizzes
🔳 Resources

Search Forums ⊟
[Go]
Advanced search ⓪

Administration ⊟
🔳 Grades
🔳 Profile

Topic outline

🔳 News forum

1 🔳 Materi umum ☐

2 🔳 Materi Auditory Global ☐

Latest News ⊟
(No news has been posted yet)

List Of Activities ⊟
🔳 Forums
☑ Quizzes
🔳 Resources

Upcoming Schedules ⊟
There are no upcoming events

Adaptive Learning ⊟
You are viewing:
Auditory - Global
Profile

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Student View

Adaptive 3
You are logged in as Herman Student (Logout)

Adaptive ▶ CF101 ▶ Profile

Profile | Questionnaire History | Quiz History | Logs

Completed	Result	Style
17 January 2009 20:40:52	• Style Group 1 　○ Visual ： 0 　○ Auditory ： 0 　○ Kinaesthetic ： 2 • Style Group 2 　○ Global ： 1 　○ Sequential ： 2	Kinaesthetic - Sequential
17 January 2009 20:49:43	• Style Group 1 　○ Visual ： 1 　○ Auditory ： 1 　○ Kinaesthetic ： 0 • Style Group 2 　○ Global ： 1 　○ Sequential ： 1	Visual - Global

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On The Net

Adaptive Elearning - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.elearningadaptive.com/ | Google | Video:79

Adaptive Elearning

Home | Daftar | Login

Anda saat ini belum login (Login)

Adaptive Elearning adalah sistem elearning yang mampu mengadaptasi tampilan materi pembelajarannya sesuai dengan karakteristik peserta didik. Melalui elearning ini diharapkan para peserta didik dapat belajar secara optimal karena mereka mendapatkan materi pembelajaran sesuai dengan yang dibutuhkan.

Materi yang disajikan dalam elearning ini tergantung dari kecenderungan gaya belajar peserta didik. Setelah peserta didik login dan memilih mata pelajaran, mereka akan mengisi kuesioner sehingga sistem akan mengidentifikasi bagaimana kecenderungan mereka. Kecenderungan gaya belajar dikategorikan menjadi tiga, yakni Visual, Auditory, dan Kinestetik.

Skor hasil kuesioner akan menentukan apakah seorang peserta didik akan mendapatkan materi pembelajaran dengan orientasi Visual, Auditory atau Kinestetik. Dengan demikian dia akan mempelajari materi sesuai dengan kecenderungan gaya belajarnya.

Available Courses

Struktur Data

Resources
Flowchart Guru
Flowchart Siswa

Links
Elearning Jogja
E-learning UNY
Personal Website
Personal Blog

Online Users
(last 5 minutes)
Herman D Surjono
Admin User

2008©hermands

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Done

Conclusion

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- The result would be a model of adaptive e-learning system based on the student's learning styles diversity.
- The system will identify the student's learning styles tendency through a set of questionnaire.
- The questionnaire scores will be used by the system as a basis to provide the student a presentation of learning materials differently.
- The system is implemented by customizing the LMS of Moodle.

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THANK YOU

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