Design and Development of E-Learning Contents and Online Activities

By:
Dr Muhammad Sabri Sahrir
(DALL, KIRKHS, IIUM)

Workshop material for CELPAD E-Learning Course
11th NOVEMBER 2011

http://www.iium.edu.my
1- Introduction

2- Definitions
   a) Design and Development
   b) E-Learning Contents
   c) Online Activities

3- Phases of Design and Development + Learning Contents + Activities (A model of D&D for the prototype in an online Arabic learning game). - PRACTICAL

4- Conclusions, discussions and suggestions.
Definitions

1- E-Learning? Some definitions:

“E-Learning is the delivery of individualized, comprehensive, dynamic learning content in real time, aiding the development of communities of knowledge, linking learners and practitioners with experts.” – http://www.linezine.com/elearning.htm

“E-Learning refers to the use of Internet technologies to deliver a broad array of solutions that enhance knowledge and performance” - J. Rosenberg

“E-Learning is the use of network technology to design, deliver, select, administer, and extend LEARNING” – Elliot Masie, The Masie Center

“E-Learning is the convergence of learning and the Internet” – Banc of America
1- E-Learning ? Benefits:
   a) Flexibility, Accessibility, Convenience
   b) Cross platform
   c) Low delivery costs
   d) Ease of update
   e) Collaborative learning
   f) Scalability can be delivered to a small or large number of learners with little effort (Anuwar Ali, OUM)

2- Design models:
   a) Constructivist Model
   b) Mental Model
   c) Cognitive Apprenticeship Model (Joliffe, Ritter & Stevens, 2001)
1- A representation of a view on how people learn. It is also the guideline by which an instructional designer creates instruction. Models help us conceptualize a process or system. They simplify the complexities of real situations into sets of generic steps that can be applied in many contexts (Gustafson and Branch, 2001).

2- It is considered to be both a science and an art. A science because it is rooted in learning theories and an art because the designing of instructional materials is a highly creative process. (Moore, Bates & Grundling, 2002, p.71).

3- It synthesizes instructional practice, research, and theory into a methodology for learning development that is systematic (inputs produce outputs which, in turn, become inputs) and systemic since the components have a symbiotic relationship (Edmonds, Branch, and Mukherjee, 1994, p.56).
1- Morrison, Ross, and Kemp Model (Classroom-oriented) – Kemp, 1985
Instructional Design Models

2- Seels and Glasgow Model (Product-oriented) – Seels & Glasgow, 1990
This model is perhaps the **most well known of the systematic design models** and is the standard to which all other ID model (and alternative approaches to design and development of instruction) are compared. (Gustafson and Branch, 2002)
ADDIE is an acronym for Analysis, Design, Development, Implementation, and Evaluation standing for a systematic approach to instructional development synonymous to instructional systems development (ISD) (Molenda, 2003). Dick and Carey (1996) are widely referred as the torchbearers of the ADDIE methodology through their book The Systematic Design of Instruction (Kruse, 2004).
Comparing Instructional Design Models

5- Other ID models:
   a) ASSURE model (Classroom Orientation)
   b) Smith & Ragan (System Orientation)
   c) Developing A Curriculum (DACUM model)
   d) Delphi Technique
   e) Rapid Prototyping model

6- Elements of ID models:
   a) Classroom Orientation
   b) Product Orientation
   c) System Orientation

Further details: http://www.slideshare.net/msquareg/comparing-instructional-design-models
ID models vs ISD models?

1- Instructional Design (ID) models differ from Instructional System Design (ISD) models in that ISD models have a broad scope and typically divide the instruction design process into five phases (van Merriënboer, 1997, pp 2-3): ANALYSIS – DESIGN – DEVELOPMENT- IMPLEMENTATION - EVALUATION

2- In addition, ISD models uses formative evaluations in all the phases and a summative evaluation at the end of the process.

3- Some researchers are not differentiating between ID and ISD. In general, all ID and ISD models consist of these 5 main phases of ADDIE. For example, Seels & Glasgow (1998) define Instructional Design (ID) or Instructional Systems Design (ISD) as “Models of visual or verbal representations of the instructional design process that are used to guide and complete design in many training and educational settings”.

http://www.iium.edu.my
Issues in E-Learning Contents

- Learning theory, pedagogical issues, etc.
- Learner’s needs and background.
- Learning objectives, syllabus and outcomes.
- Learning environment, facilities and readiness.
- Issues of implementation: Roles of learning institutions, supports, teacher’s training, etc.
- Costs of design, development, implementation, maintenance, updating learning content, etc.
- E-learning trainer, webmaster, personnel, etc.
- Integrating, sequencing, updating, maintaining, etc.

http://www.iium.edu.my
Online Learning Activities

1- **Synchronous**: commonly supported by media such as videoconferencing and chat, has the potential to support e-learners in the development of learning communities. Learners and teachers experience synchronous e-learning as more social and avoid frustration by asking and answering questions in **real time**.

2- **Asynchronous**: commonly facilitated by media such as e-mail and discussion boards, supports work relations among learners and with teachers, even when participants **cannot be online at the same time**. Asynchronous e-learning makes it possible for learners to log on to an e-learning environment at any time and download documents or send messages to teachers or peers. Students may spend more time refining their contributions, which are generally considered more thoughtful compared to synchronous communication.

http://www.educause.edu/EDUCAUSE+Quarterly/EDUCAUSEQuarterlyMagazineVolume/AsynchronousandSynchronousELea/163445
Planning Learning Activities
(Issues to be considered)

1- Synchronous and / or Asynchronous mode.
2- E-learning as main platform eg : MEDIU/OUM or supportive platform (LMS, teaching and learning aids, etc.)
3- Facilities available: PC ratio per staff, internet LAN & wireless networks, computer and multimedia lab, multimedia courseware, web-based or non web-based learning materials.
4- Computer skills, awareness, readiness and continuous training courses for staff and/or students, pedagogical issues in e-learning.
5- Organizational support, financial needs, staff in-charged, etc.
6- Planning of e-learning implementation : learning objectives, learning contents, learner’s background, learning outcomes, etc.
7- Arrangement of weeks, lessons, learners, teachers, etc.
8- Traditional generation vs digital immigrants vs digital natives.
A blended learning model for an English Public Speaking course

A blended learning model adult learning


http://www.iium.edu.my
A framework of blended learning or hybrid learning

http://www.cognitivedesignsolutions.com/ELearning/BlendedLearning.htm

http://www.iium.edu.my
A model of D&D for the prototype in an online Arabic learning game

- General Research Framework
- Front-End Analysis Procedures
- Validations of Various Experts (ID & SME)
- Consultations from Various Experts (ID & SME)
- Constructing ‘Design principles’ - Design
- Development of Initial Prototype
- Cyclic and iterative revisions of D&D – changes and improvement of prototype
- Formative evaluation of D&D – experts, lecturers, learners
- Final product – ready to be used

http://www.iium.edu.my
Vocabulary Learning Theory (Nation, 2001)

Multimedia Learning Theory (Mayer, 2001)

Digital Game-Based Learning Theory (Prensky, 2001)

Online Vocabulary Digital Games Learning Theory

Raptivity E-Learning Software

E-Games Prototype 1

Recheck

E-Games Prototype 2

Implementation

Evaluation

ANALYSIS

DESIGN DEVELOPMENT

IMPLEMENTATION

EVALUATION

INPUT

PROCESS

OUTPUT

RESEARCH FRAMEWORK

http://www.iium.edu.my
THEORIES UNDERLYING THE DESIGN

Diagram showing the theories underlying the design, including:
- Teaching Principles
- Goals
- Content & Sequencing
- Format & Presentation
- Monitoring & Assessment
- Environment
- Need
- Cognitive
- Design Principles
- Online Vocabulary Games Learning Theory
- Multimedia Learning Theory (Mayer, 2001)
- Digital Game-Based Learning Theory (Pronsky, 2001)
- Educator's Roles
- Evaluation
- Platform
- Tools
- Characteristics
- Learning Theories
- Elements
- Active Learning
- Perception
Design and Development Process: Front End Analysis

(Adapted from Dabbagh, 2006)

http://www.iium.edu.my
1- ‘Fuzzified Instructional Design Development of Game-like Environments’ or FID\(^2\)GE model (Akilli, 2004)

2- Several frameworks and models have been proposed by researchers in the field of game design (Tan, Ling & Ting, 2007).

3- This Arabic online vocabulary games were built based on 5 levels of games learning which Prensky (2001) refers to as: ”“How,” “What,”“Why,” “Where,” and “When/ Whether” levels at which video and computer games learning occurs (Pivec, Koubek & Dondi, 2004)
### 2 types of DR (Type 1 was selected)

<table>
<thead>
<tr>
<th>Emphasis</th>
<th>Product &amp; Tool Research Or TYPE 1 of DR</th>
<th>Model Research Or TYPE 2 of DR</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Emphasis</strong></td>
<td>Study of specific product or program design, development, &amp;/or evaluation project</td>
<td>Study of design, development, or evaluation processes, tools, or models</td>
</tr>
<tr>
<td><strong>Product</strong></td>
<td>Lessons learned from developing specific products and analyzing the conditions that facilitate their use</td>
<td>New design, development, and evaluation procedures &amp;/or models and conditions that facilitate their use</td>
</tr>
</tbody>
</table>

**CONCLUSION**

**(Richey, Klein & Nelson, 2004)**

http://www.iiuum.edu.my
Formulation of Design Principles

- Selection of type and range of Arabic vocabulary.
- Integration strategy between game-based learning and learning objective and contents.
- Build in facilitative role of learners.
- Build in facilitative role of lecturers.
- Games language support through English translation.
- Employing ‘Play’ and ‘Learn’ concepts.
- Build in a cycle of a learning interaction.
- Learning support through the use of multimedia graphics and animations.
- Formative evaluation in game-based learning; eg. Vocabulary test games.
- Integration of Islamic values and virtue in game-based learning.
- Online supportive tools for searching vocabulary meanings.

http://www.iium.edu.my
Formative Evaluation Framework

(Adapted from Tessmer, 1993)

http://www.iium.edu.my
Characteristics of this Online Game Prototype

- Aimed at elementary Arabic learners in CFSIIUM
- A compendium of 34 games (variety of games, 7 levels of vocabulary difficulties, online supportive tools)
- Functions as a support for Arabic language learning in the classroom/multimedia lab.
  - The lecturer facilitates (facilitator)
  - Learners collaborate (collaborative learning)
  - Has the potential for self instruction (asynchronous)
  - Supportive learning tool for blended/hybrid learning
  - Can be used between 14 weeks of semester

http://www.iium.edu.my
ITERATIVE FORMATIVE EVALUATION (DIFFERENT SESSIONS DURING D&D)

SMALL GROUP EVALUATION

FIELD TEST EVALUATION 1

FIELD TEST EVALUATION 2
INSTRUCTIONS FOR USERS:

- The games were designed for Arabic elementary learners (LQM 1061), science-based learners at Centre for Foundation Studies (CFS), IIUM as an additional game-based learning aid for Arabic language.
- Please choose the games based on 7 levels of vocabulary learning: alphabet, word, synonym, antonym, grammar, phrase and sentence.
- The learners are required to learn the vocabularies in the textbook before playing the chosen games.
- The games are in single-player mode, but the player could play any one of the games collaboratively with their friends.
- The vocabulary test games below were prepared to evaluate learner’s performance after playing all games in this website.

TECHNICAL REQUIREMENT:

- Intel Pentium II Processor or higher
- 64 MB RAM
- 256-color monitor or better
- Internet Explorer 5.5 or above, Netscape 7.1 and 7.2, Firefox 1.0.2 or Safari
- Flash Player 8 or above. Click any of the following buttons to download.

Macromedia Flash Player Version 8 or Adobe Flash Player

Arabic note Pictures, Images and

ASSISTANCE TOOLS AND BUTTONS

Online Translator, Games Glossary, Online Dictionary, Vocabulary Test 1, Vocabulary Test 2

CFS Website Link

Dept. of Arabic Language & Literature, FIBHIS

ITIUM Website Link
Screenshot 2
LINK: www.arabic-games-iium.net
Awards and Recognitions

- Silver medal award (Invention category – Student), in IID-SE 2010, UiTM.

http://www.iium.edu.my
Awards and Recognitions

- Silver medal award (Social sciences and Humanities category), in IRIIE 2011, IIUM.
  (9 – 10 February 2011)
Awards and Recognitions

- Bronze medal award (Open category), in I-Inova 2011, USIM. (14 – 16 October 2011)

http://www.iium.edu.my
1- Muhammad Sabri, Sahrir & Mohd Feham, Md Ghalib, (2009). *Employing a Developmental research approach in the design and development of an online Arabic vocabulary games learning prototype in IIUM.* The 2nd International Conference of Arabic Language and Literature, hosted by Department of Arabic Language and Literature, KIRKHS, International Islamic University Malaysia (IIUM), Kuala Lumpur, 21-23 December.


Research Exhibitions

1. IIUM Research, Invention and Innovation Exhibition - IRIIE (IRIIE 2010)

2. IIUM Research, Invention and Innovation Exhibition - IRIIE (IRIIE 2011)


4. Invention, Innovation and Design – Special Edition (IID-SE, 2010), UiTM

5. Catalogued in the National Grassroot Innovation Databank of Yayasan Inovasi Malaysia (No. 94)

6. Islamic Innovation Expo (I-INOVA 2011), organised by USIM nd MOHE.

http://www.iium.edu.my
Conclusions, Discussions & Suggestions

**COLLABORATIVE RESEARCH**

Design & Development

E-Learning Content

Planning Activities

PROCESS OF D&D

[IIUM TOWARDS RESEARCH UNIVERSITY STATUS](http://www.slideshare.net/sabrigld/design-and-development-of-e-learning-contents-and-online-activities)

[IIUM.edu.my](http://www.iium.edu.my)
End of Presentation

Thanks for your kind attention

Q & A session
References

- ADDIE Timeline, [http://www.nwlink.com/~donclark/history_isd/addie.html#extend](http://www.nwlink.com/~donclark/history_isd/addie.html#extend)
- College Station (2001). *ADDIE instructional design model*. Texas Copyright 2001 © LOT All rights reserved. Published on January 23, 2001. Retrieved from [http://htms\training\handouts\pf_files\addie.doc](http://htms\training\handouts\pf_files\addie.doc)
References (cont.)


