Modeling the E-Learning Content Designed for the University Students

Qasim Mahdi Haref

Department of Computer Engineering Technologies, Imam Kadhum College (IMC), Iraq
qasimmahdi@alkadhum-col.edu.iq

Abstract: With the evolvement of internet and maturation of e-learning method; attention is ever increasing towards development of e-content that achieves the required educational goals set by tutors. The importance of e-content development is now recognized as a major factor of e-learning design. To create a proper electronic learning content to various social strata (especially tutors); the e-content should be designed in a manner that is centrally focused on learners; effective; easily accessible; flexible; and in "user friendly" electronic content. This article are going to solve a problem, which is designing and adapting the e-learning content to solve educational content design Inability in attract the attention of students to the educational material, that makes a lack of desire to learn, fully comprehend of educational content is not be as expected, also not taking into account the individual variability of student, finally, student is recipient not participant. In order to attack the main problem, we discussed some of the important factors that spread over the various dimensions of e-learning environment. We have also explored those factors that significantly render the e-content fruitful; accessible and flexible. Those factors fall into four categories: Management-related factors, Technological factors, Pedagogical factors, User interface. Based on that, we have introduced a detailed approach to design the learning content and proposed design model that can be applied to effectively design the content, Where presents the econtent in a flexible; accessible and meaningful manner. This model was applied, assessed and the results were recorded and matched to the educational goals intended as well as, we have successfully design a model to adapt the learning content in education by a questionnaire applied on a group of students that was both concerned and involved in the e-learning process

Keywords: E-content design, E-learning content.

Introduction

Setting the goals, strategies, and different teaching methods necessary to achieve goals, as well as, documents specific learning objectives, assessment instruments, exercises, and content. The overall system contains four elements: that's Administrator, Student, Black board and Course. The E-course displays at university web site on the Black Board, students, Instructor, and Administrator choice the courses in this semester and register in it to have an account. They can view the E-course from anywhere at any time; also view a sample of the course and instruction information, choice of the time for lecture and instructor. Check the attendance of the student through registration information, and know the student in this course. Updating and validation of course is enabling to do in this system**. (1)** Each element has an ID and Password to be able to access to the system and course, this account information could be processed by administrator and instructor through operations such as create, delete, and update. About assessment: can emplace assessment and get a mark, also update and create it when it need by instructor, then students can log the system to take the assessment and get mark as feedback of the assessment process**. (2)** About the course, both of instructor and admin can control the course that is loaded to the system by many operations such as load or create, update, and delete. Students and instructors can display the course and pages of course, then navigate the overall objects what and when they need, so they can play both video and sound, show animations, go to next and back page, and go to home page and other functions. The communications also has allocation; the system allows communication between the Instructor and student through the procedure of question and answer. In this system not anybody can log in and enter to the system but there is an ID and a password that is given from admin to Student and instructor so it is security system. The system can do what user wants and needs and its enable to use from any actor at any time, so it's availability and flexibility system, This system can view all components of system that user need it. **(3)** This system is user-friendly. More characteristics, activities, and features the learner and tutor can benefit from it will be illustrated in the implementation phase section when talking about the Model learning management system and what offers of possibilities to achieve the desired goal.

Structure Design

The design contains two parts, the first one is information about the course, and the second is course chapters/modules. The first part contains these items: course information, tutor information, syllabus, and references. **(4)** The second one contains two chapters/modules form the Artificial Intelligence course. Each module divided as follows:

• Introduction (contains the module objectives).

• Module's sections.

• Summary.

• Exercises (practice if any).

Designing the graphical user interface

Based on the golden rules the design should be as follows:

1. Strive for consistency:

• Information, the names and arrangement of menus, the size, shape, font and color of icons are consistent throughout the design; also make a homogenous environment with the overall design. **(5)**

2. Offer informative feedback

• Each action that the user performs will get result in some type of feedback from the computer – Ex. When the user takes an exam and finishes it the result will be displayed

3. Design dialogs to yield closure

• Users need to feel that they can explore options and take actions that can be canceled easily

• If they make an error, they can cancel the action

• Should include cancel buttons on all dialog boxes- Ex. When the user takes an exam he/she can cancel it, the exam contains cancel button. **(6)**

4. Reduce short-term memory load

• People have short-term memory limitations

• People remember only about little chunks of information at a time.

Ex. doesn't need to ask the learner to remember everything. Also the design contains Header, menus, and content area. We will start from home page; home page contains several functions which will explained to each object alone. **(7)**
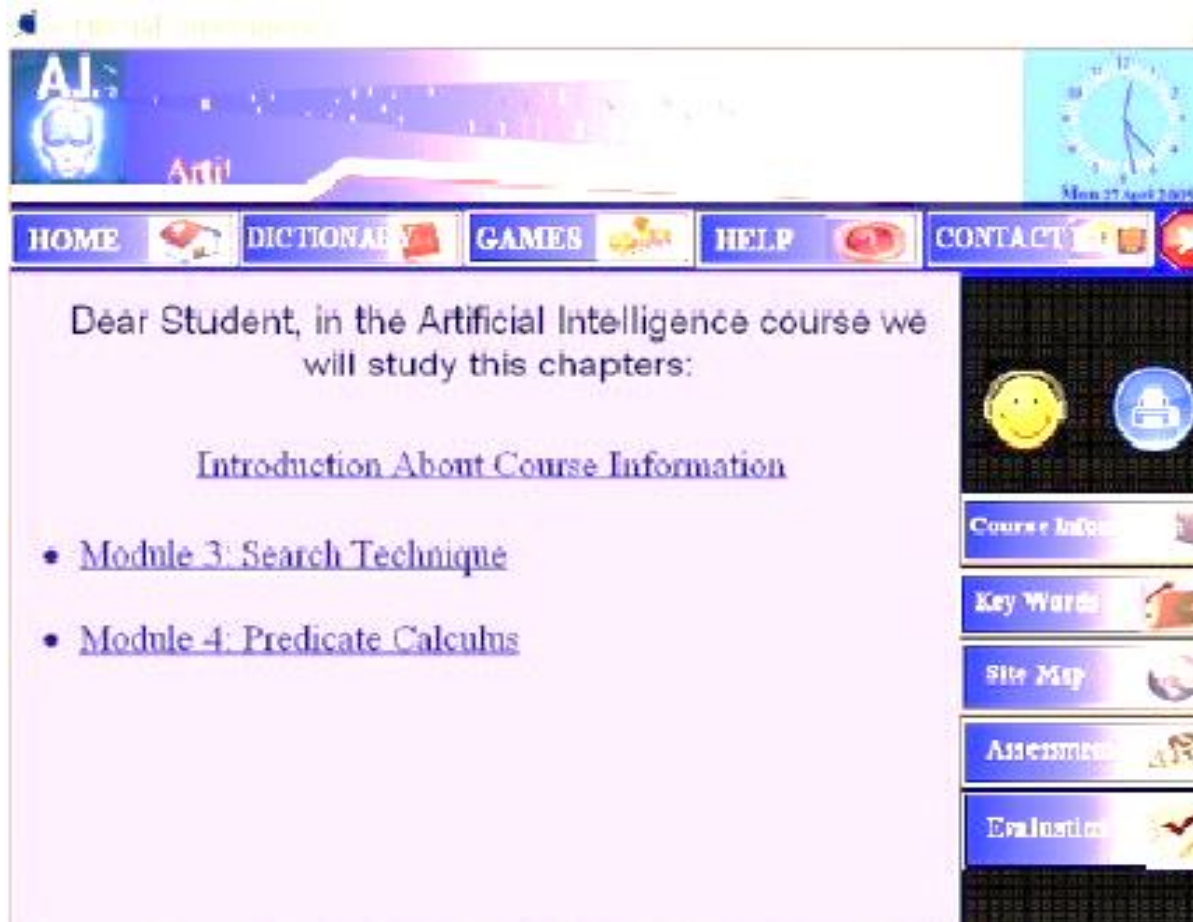

Figure 1 Graphical User Interface for Design

At the top of site banner that represent the title of course -AI- and on the right side you will see the time and date, under the banner a panel which contains a group of buttons that perform a particular function.

• The Home button linked to the first page in the course.

• The Dictionary button linked to the Dictionary page that translates the word from several languages to several languages by Google translation. **(8)**

• The Games button linked to games page and contains several games to support some of AI concepts.

• The Help button linked to help wizard.

• The contact us button linked to contact information about designers.

• The Exit button closes the application.

Figure 2: Main Menu

In the right side we have a menu which represents a group of buttons each one has a particular function: **(9)**

• Course Information button linked to the page and contains information about the course, we will explain it later.

• Key words button linked to pages and contain the key words in the whole course sorted by alphabetic, we will explain it later.

• Site map button linked to the page and contains a table of content for a whole course (modules, sections, and pages), we will explain it later.

• Assessment button linked to the pages and contains an exam after complete the course in the multiple choice and true/false form.

• Evaluation button linked to the pages and contains questions about the usability in the course design in the multiple choice form.
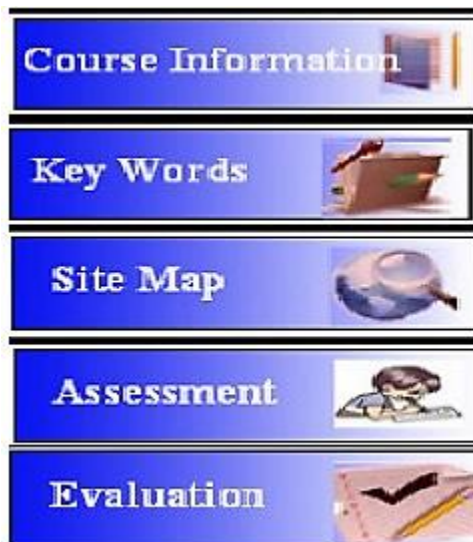

Figure 3: Right Menu

There are some of buttons in the top menus which need illustration:

Dictionary button linked to page that represent the translation method which you can click to perform the process. Games button linked to page contains a group of games designed to support the AI concepts, you can start playing by clicking any link (note: you should be online). The right menu again contains buttons which need explanation:

The Course Information button linked to the pages and contains information about the course, as well as, these pages which have a menu representing the course information parts:

• Course Information button linked to the page and contains the course name, pre-request, department, course description, aims, and learning outcomes.

• Syllabus button linked to the page contains contents outline.

• Tutor Information button linked to the page contains information about the tutor's name, phone, fax, mail, and office number and hours.

• References button linked to the page and contain the recourses and references (Text book and support material) that the content referred to it.
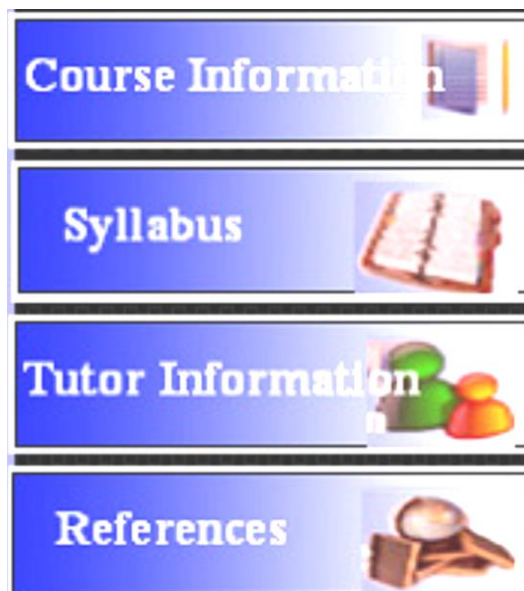

Figure 4: Course Information Menu

The key words button linked to the pages contain key words sorted by alphabetical order for the whole course to help student access easily the particular subject that he is interested in.

Letter	Words	Module #	Section #	Page #
	Data base standard form	4	4	3
	Deep	3	3	1, 4
	Demonstrating the equivalence	4	2	13
	Depth	3	6	4,5,8,10
	Depth first search	3	4	1
		3	3	1, 3
	Descendant	3	3	1
D	Deterministic	3	6	3
	Directed graph	3	1	4
	Disadvantage	3	1	2
		3	3	4
		3	2	5
	Disjunction	4	2	5,6,10
		4	3	11
		4	4	4
	Domain knowledge	3	6	10

Side panel letters:
D
A
B
C
C
D
E
F+ G+H
I +K +L
M + N
O + P

Figure 5: Key Word Page of Course

Site map button linked to the page contains a content table shows the course partition (modules, sections, and lessons) and you can also access any of them just by clicking.

Site map tree:
- Flash Intro
- Home page
- + Course Information
- + Module 3:Search Technique
- + Module 4:Predicate Calculus
- + Exam result
- + Games
- + Contact Us
- + Dictionary
- + key words
- − Site Map
  - Site Map
- + Assessment
- + Survey 1

Figure 6: Site Map of Course

Assessment button linked to the pages and contain an exam at the end of course to assessment and test the student to absorb the educational content in the end of

course, these questions are represented in the form of multiple-choice and true/false.

Figure 7: Assessment Forms

The course has been divided as follows: Module – Sections – Lessons, so each module has sections and each section has lessons. In each section we have the objectives form this section, then, introduction, after that lessons, then summary, and exercises. In the home page we display the links for the modules which allow students to move to the module that they want by clicking. (**10**)

Figure 8: Links of the Modules in the Course

Implementation phase:

The phase of the designed course is delivered or distributed to the students group. Also, ensure the devices have the appropriate access to the design and that users are provided with logins and passwords to access if necessary. Check that there is enough seating and comfortable temperature, proper lighting etc. also, ensure there is plenty of technical support. **(11)** Also, provide teacher users manuals guides for trouble-shooting. Lectora program can publish the course to HTML, Lectora exe file, and to CDRom or to CorseMill. After we publish the html course or as Lectora exe file, we load it to Blackboard which is the delivery environment or learning management system to our course. There is another way we can deliver the content design that is through other learning management system (LMS), which is Moodle, Moodle is a package of programs for produced courses on the Internet and web sites. Moodle is acronym for Modular Object-Oriented Dynamic Learning Environment. Moodle is a package of programs for produced course on the internet; it considers an open source course management system, as well as, learning management system and can be used on any computer and any operating system. Moodle website provides features for Moodle's users such as central point of information, discussion, and collaboration among them, and always evolving to meet user's needs. During the design on the Moodle can provide many services: promote the collaboration through blogs, messaging, participant lists, …etc, and activities like forum, glossaries, wikis, assignment, quizzes,…etc, suitable for supplementing face-to face learning, provide full database abstraction, also have strong securities throughout, as well as, the ability for categorized and searched the course. With respect to management side, Moodle interest with the site management, User management, and Course management as follows: **(12)**

Site management: Moodle's site is managed by an administrator who has the authority to modify the site, customize the themes (color, font, layout …etc) to be appropriate for local use and needs. Site is also distinguish oneself with possibility to add additional tools, such as adding activity modules to Moodle, as well as, Possibility of adding and editing the languages packs which contains more than 70 languages. User management: to reduce the role of admin were taken the user (tutor and learner) into account where some of authentication assigned to user like create and manage his/her account, build an on-line profile, specify own time-zone, choose the language used for the Moodle interface, as well as, the enrolment process …etc, all of these roles with keep the security. Course management: each course has coordinator or full tutor has a full control over all setting of a course

359

with restricting other tutor, as well as, each course contains different activities placed on a flexible array that contribute to enrich the educational process. These activities are: **(13)**

Forums: discussion area contains author's files attached, contribute to increase the communication between the learner's themselves and between the learner and tutor.

Glossaries: allows participant to create and maintain a list of definitions, like a dictionary and can be searched, imported, and exported. Where this process is carry out under the control of instructor before publishing.

Wikis: consider as a web page that anyone can modify, add to or delete, also, supports the collaborative learning and restoring the old version from the authored collectively documents.

Assignment: allow the students to enhance their understanding and examine their comprehended, as well as, provide feedback to tutor for learner's results, assignment that uploaded by learners specified with due date and maximum grade and show the amount of learner to tutor. Multiple files can be uploaded for assignment.

Quizzes: it is questions bank placed by tutor for re-using in quizzes, it is easy to categorization access and can provide auto-grading for questions. Types of question are: **(14)**

Multiple choice, true/false, short answer, matching, random, numerical, embedded. Answer and descriptive text, graphics and passage of text. And can accept any file format and type.

Survey: on-line built-in survey with feedback provided to students. Resources: supporting the display of all types and format of e-content and managed them.

Lessons: series of pages presented in more than style to students who can navigate these pages easily and doing some activities. Also, Moodle enables the communication between tutor and learners and full user tracking.

Conclusion:

Although e- content design reaches to advance stages, it can improve and support the learning process if we effectively handle the e content design and adaptation issues. In our thesis, we have introduced a top-down content design approach that guarantees an effective displaying and downloading of the learning content. The approach focuses on splitting the learning content into small learning objects each with objectives or sub objectives. Each learning object must be available in several forms which are: text, audio, video, animation, and image. We found these learning objects assist the learner in attract their attention to the educational material, that makes a lack of desire to learn, Achieve fully comprehend of educational content as expected, also taking into account the individual variability of learner, and learner is participant not recipient . In our work, we interest in design learning objects in a way that ensure achieving the previous objectives Taking into account all the characteristics of learning objects in terms of size and clarity . Finally, the learning objects organized according to an instructional design model, they should be related to each other in a tree hierarchy structure and they must be adapted to achieve the learner satisfaction and learning objectives. Furthermore, while implementing the model, we found that the desire of students to follow the model some of the important factors that spread over the various dimensions of e-learning content. We have also explored those factors that significantly render the e-content fruitful; accessible and flexible. Those factors fall into four categories and based on these factor we generate four assumption, These assumptions have been adopted in the design of the model cause capture these elements of the reasons that contribute to solving the educational problems in the case were taken into consideration and taken into account :

1- Management-related assumption.

2- Technological assumption.

3- Pedagogical assumption.

4- User interface assumption.

The proposed model was tested through the design of artificial intelligence course based on this model and questionnaire was applied on a group of students that was both concerned and involved in the e-learning process.

References:

[1] Advanced Distributed Learning Initiative, Sharable Content Object Reference Model, Version 1.2, (2001).

[2] Ardito, C.; Costabile, M. F.; De Marsico, M.; Lanzilotti, R.; Levialdi, S.; Roselli, T.; Rossano, V.: An approach to usability evaluation of e learning applications, Universal Access in the Information Society, Vol. 4, No. 3, 2006.

[3] Brown, A.; Voltz, B.: "Elements of Effective e-Learning Design", Proc.of International Review of Research in Open and Distance Learning, (2005)

[4] Chyung, Y.: "Learning Object-Based e-Learning: Content Design, Methods, and Tools", the e-learning Guild's, e-magazine, (2007)

[5] Downes, S.; Mourad, M.; Piccariello, H.; Robson, R.: "Digital Rights Management in Elearning Problem Statement and Terms of Reference", Proc. of the Internationa Conference Association for the Advancement of Computing in Education (AACE), (2003).

[6] Hall, B.; Snider, A. "Glossary: The hottest buzz words in the industry", ESchreiber, D., A.;Berge, Z., L., (2000).

[7] Institute for Interactive Technologies, "E-Learning Concepts and Techniques", Ebook, Bloomsburg University of Pennsylvania, USA (2005).62

[8] LOM. Draft Standard for Learning Object Metadata IEEE P1484.12/D4.1 IEEE, (2000).

[9] Omwenga, E.I, Waema, T.M, Eisendrath, G.P.C, Libotton, A, Structured Econtent Development Framework, (2005)

[10] Reeves, Barry .Instructional design for online courseware for vocational education and training, 2001

[11] Shiratuddin, N., Hassan, S., & Landoni, M. . A Usability Study for Promoting eContent in Higher Education. p 113) (2003)

[12] Spector, J., M., "The Legacy of Robert M. Gagne", pp.107-124, ERIC Clearinghouse on Information and Technology, Syracuse, (2000).

[13] Trifonova, A.; Ronchetti, M.: "Hoarding Content in M-Learning Context", PhD thesis, University of Trento, Italy, (2006).

[14] Urdan, T. A.; Weggen C. C.: "Corporate e-learning: Exploring a new frontier", WR Hambrecht & Co, (2000).