

A FRAMEWORK FOR E-LEARNING AND WEB TEACHING SYSTEM

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ABSTRACT

The aim of this paper is to design and implement a framework for e-learning and web teaching system in delivering (courses, lessons, examples, exercises, exercise solutions, self evaluation test, send and receive report) via web technology and database system. We proposed an e-learning system which is divided into three interfaces (1-Administrator 2-Instructor 3-Student). This system has been developed to provide e-learning solutions over Internet or intranet and represents the new technology of education, significantly improving the learning process especially for universities. In the proposed system we used the following technologies:-

1- HTML (Hypertext Markup Language). 2- SQL Server 2000 (Structured Query Language). 3- ASP (Active Server Page). 4- ADO (ActiveX Data Object).

Proposed system design consists of:-

1- System structure for e-learning system.

2- Flow diagrams for

*(1-Administrator interface 2-Instructor interface
3-Student interface 4-E-learning system)*

3- Flowcharts for implementation

*(1- Administrator interface 2- Instructor interface
3- Student interface).*

4- Database diagram for proposed e-learning system.

Keywords: : E-learning, E-learning web tools, system design

1. INTRODUCTION

E-learning is one of the revolutions that were born through the growth of the new technologies and the Internet and change everyone's way of view about education and the delivery of knowledge. It is used more and more in education as it can deliver knowledge through Internet or intranet [1].

E-learning is a concept which comprises almost anything related to learning in combination with information and communication technology (ICT). E-learning can be defined as follows:

“E-learning is the acquisition and use of knowledge distributed and facilitated primarily by electronic means.” [2].

In general, e-learning is instruction that is delivered electronically via a Web browser through the Internet or an intranet, or through multimedia platforms such as CD-ROM or DVD [3].

Concretely, e-learning is defined as “delivery of learning, training or education program by electronic means involving the use of a computer or electronic

device in some way to provide training, educational or learning material.” [4].

This new method is more efficient and helpful than other methods and it enhances the efficiency of e-learning from the perspective of teaching, learning and administration. The purpose of this work are:

- 1- To increase learning efficiency for students in the university.
- 2- Providing information about the courses.
- 3- Collecting lectures of all instructors about courses and presenting in such a way which is more powerful than lecture in the class by providing videos and lectures presentation.
- 4- Providing exercises, exercise solutions and examples in detail which can not be discussed in class because of time is limited.
- 5- Providing self evaluation test for all courses.
- 6- All students can send report to instructor if they found any difficulty in lecture and all questions and answers can be seen between students and instructors.
- 7- Instructor can record the lessons in videos these videos will be collected and inserted into database.
- 8- To build network that need it to create and offer e-learning.

This paper is organized as follows:

In section 2, e-learning web tools are discussed briefly; In section 3, proposed system structure; In section 4, flow diagrams are described; In section 5, flowcharts for implementation are demonstrated to prove new design; In section 6, database diagram for proposed system structure; In section 7, discussion about e-learning system; In section 8, conclusions are drawn for this paper.

2. E-LEARNING WEB TOOLS

To design e-learning website we need the following technologies:

2.1. HTML (HYPER TEXT MARKUP LANGUAGE)

To create basic page layout and hyperlink architecture for web pages [5].

2.2 MS-SQL SERVER

Is a Structure Query Language for accessing and manipulating database [6].

2.3 ASP (ACTIVE SERVER PAGE)

ASP is a Microsoft technology powerful tool for making dynamic and interactive Web pages [6].

2.4 ADO (ACTIVEX DATA OBJECT)

Is a Microsoft technology used to a programming interface to access data in a database [6].

3. PROPOSED SYSTEM STRUCTURE

The proposed system is built on intranet and Internet. The system consists of three interfaces (administrator, Instructor, Student) administrator manage web server they other can use web clients. Instructor and student use a web browser (Microsoft Internet Explorer) for the web client to access the web server; administrator can use Internet Information Server, ASP (Active Server Pages) and SQL Server database (DB) for the web server. The E-learning DB stores administrator data, Instructor data, Student data and course structure data. The source contents are stored as HTML files, PPT files and any other files for better understanding.

The Active Server Pages script files control the system (Figure 1). A learner gets access to the web server from a web browser. The data flow is controlled by the script files for Active Server Pages. When a learner starts a course, the learner's data in the e-learning database is referenced by the system.

The course structure data such as the number of chapters or lessons, examples, exercises, exercise solutions, self evaluation test, send report to instructor are stored in the e-learning database. The contents itself are stored as the source contents data and are linked from E-learning database.

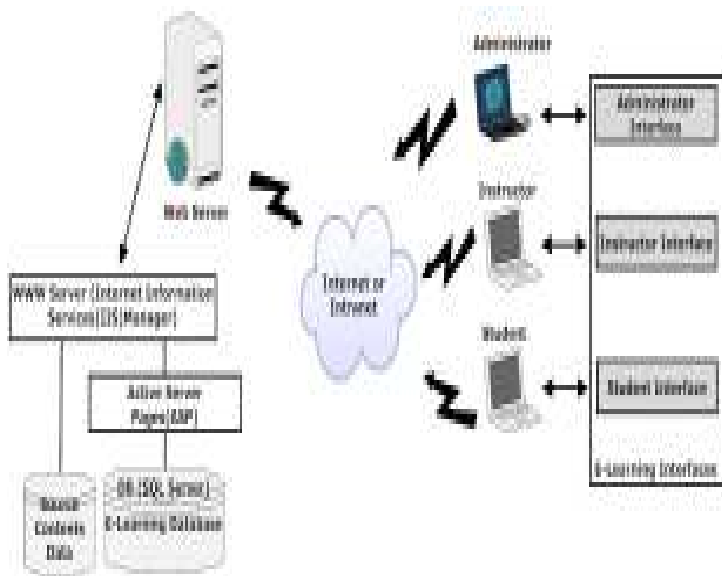


Figure 1: E-learning system structure

4. FLOW DIAGRAMS

It is a very convenient way to describe an e-learning system based on its functions respectively. We defined main functions for e-learning system based on flow diagrams.

4.1. STUDENT FLOW

This diagram describes main functions for students. After login to the e-learning system student can see course materials, lessons, examples, exercises, exercise solutions, self evaluation test and can send report to instructor (Figure 2).

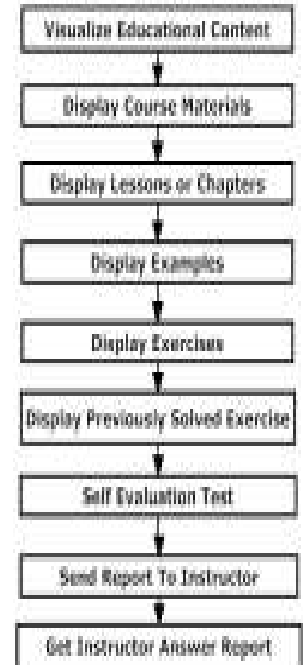


Figure 2: Student flow diagram

4.2. INSTRUCTOR FLOW

This diagram describes main functions for instructor. After login to the e-learning system. The instructor's can see instructor interface that contain evaluate student report, send answer to student, send instructor id and name to administrator, send student id and name to administrator, can prepare quiz exam for students and can access directly to student interface (Figure 3).

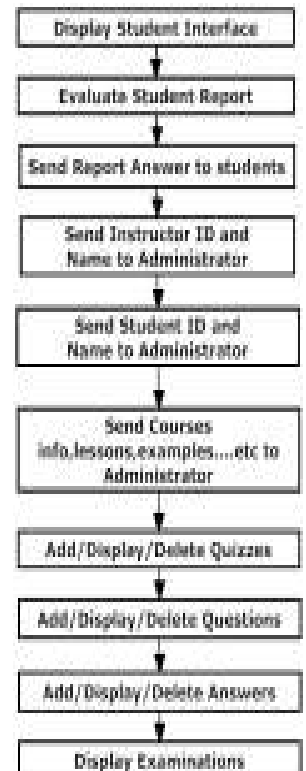


Figure 3: Instructor flow diagram

4.3. ADMINISTRATOR FLOW

This diagram describes main functions for administrator. E-learning system administrator can do the following functions.

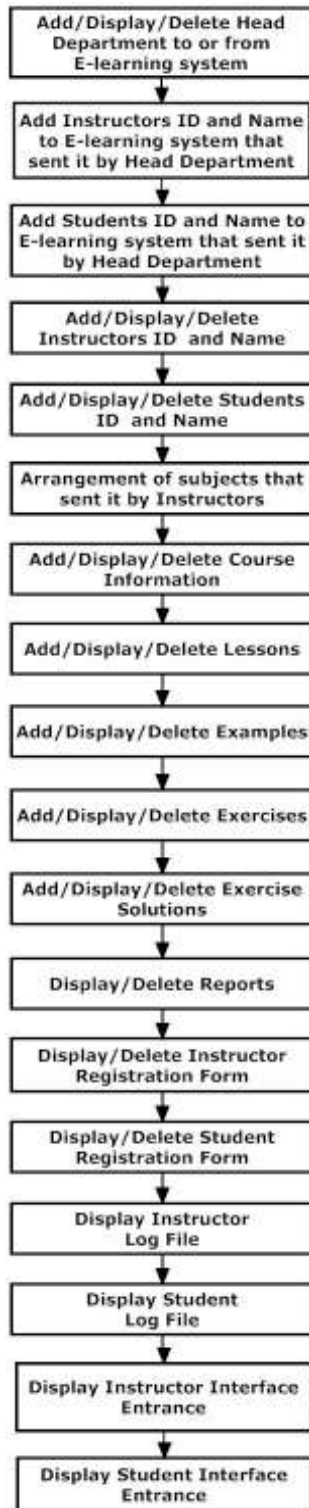


Fig.4 Administrator flow

4.4. E-LEARNING FLOW

In the previous sections, three separate flow diagrams for e-learning system are discussed in details. Now we need to know how these flow diagrams work together so that an effective overall flow diagram for e-learning can be formed.

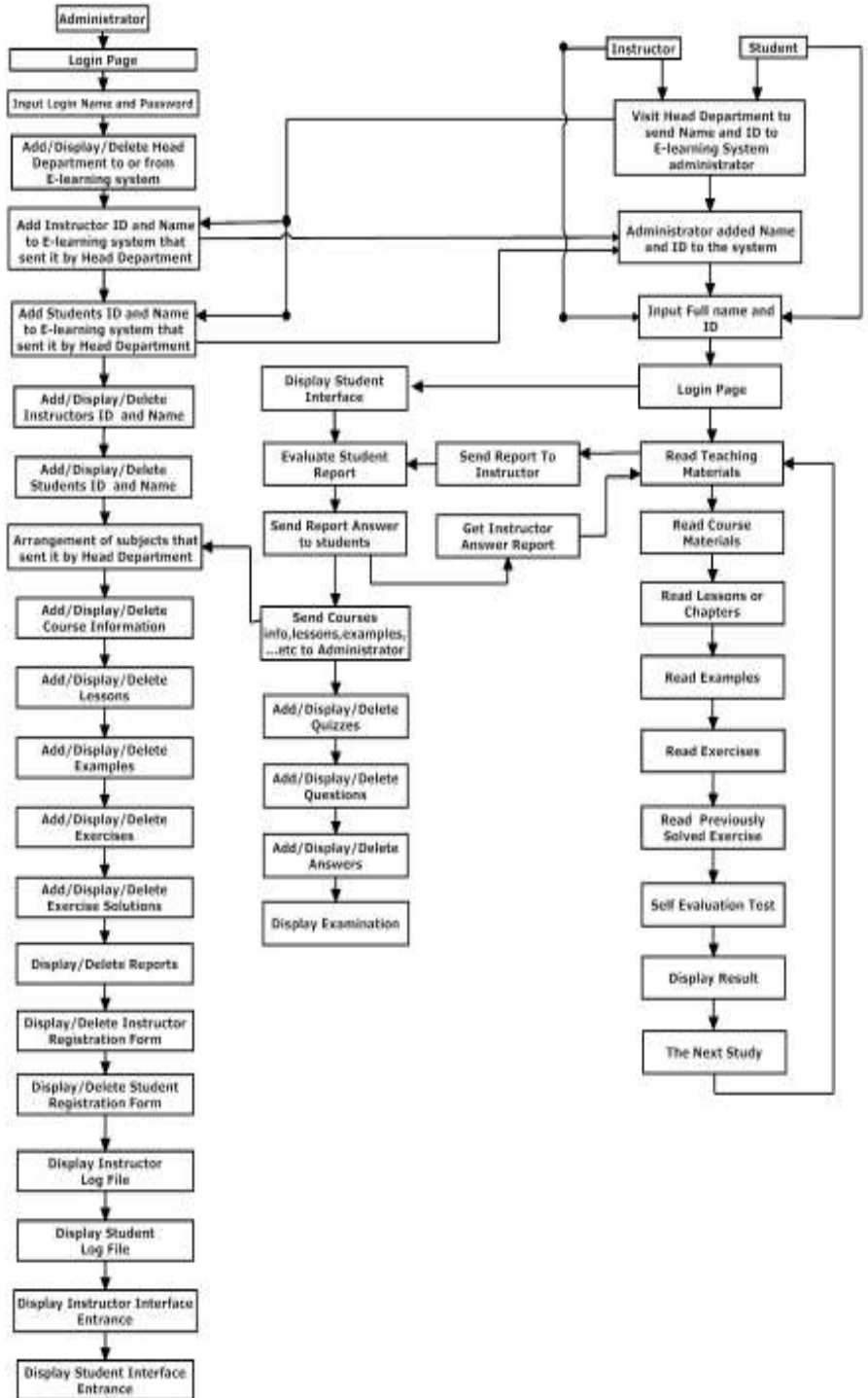


Figure 5: E-learning flow diagram

5. FLOWCHART FOR IMLEMENTATION

5.1. STUDENT INTERFACE FLOWCHART

After implementation main functions for student flow diagram by using mentioned technology tools we designed this flowchart (Figure 6). At the beginning, student can visit head department to add his/her name and id. The head department sends student name and id to administrator. The administrator adds student id and name to e-learning database system.

Student can input name and id, the system check his/her name and id with database if already exist can fill up registration form to choose login name and password at this time the system create cookies for this name to protect student name. If student want to login, input login name and password the system check login name and password with database if correct create session for this name and directly logon to the system. After login student can see main functions for student interface that described in the student flow diagram. If student forget password can answer security question to see his/her password. If student want to change password he/she can do.

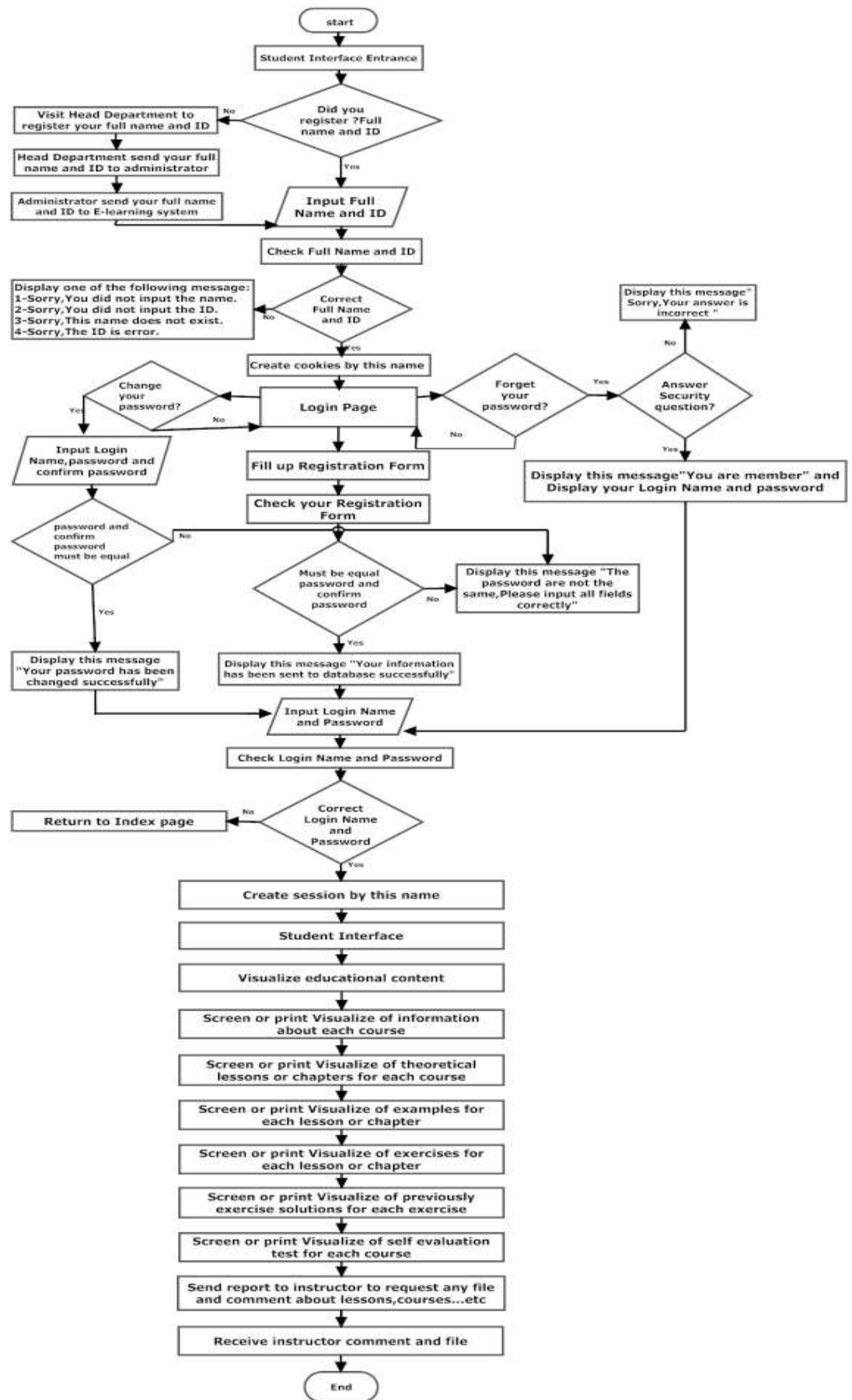
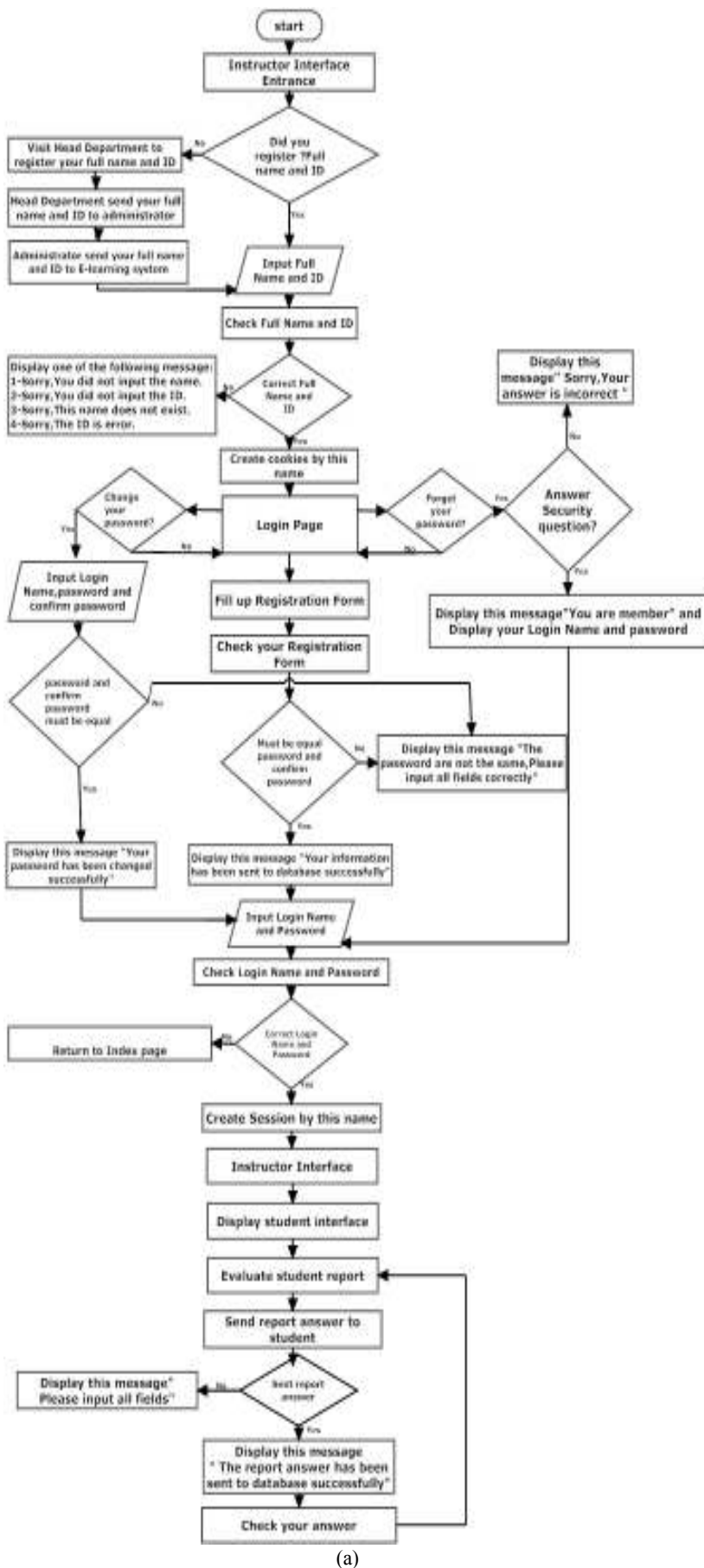
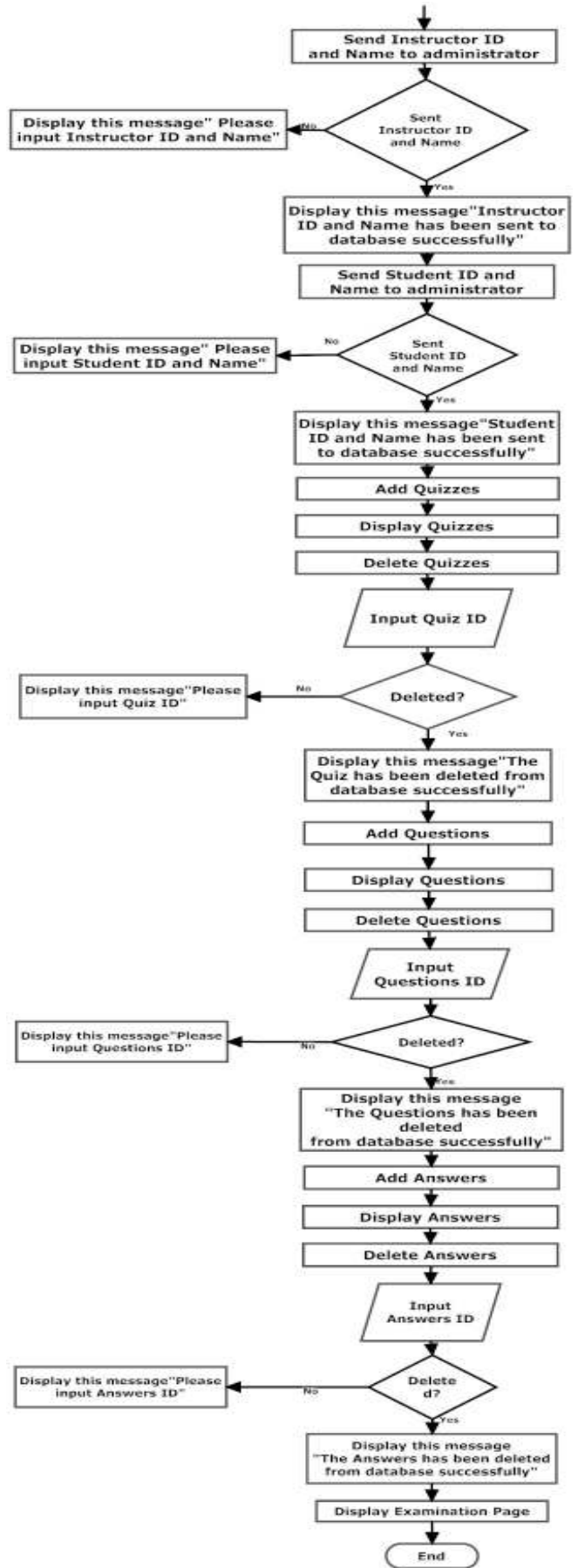


Figure 6: Implementation flowchart for student interface

5.2. INSTRUCTOR INTERFACE FLOWCHART



(a)



(b)

Figure 7: (a) and (b) Implementation flowchart for instructor interface

The flowchart for instructor interface is divided into two parts (a) and (b), at the beginning (a) is started by start symbol and (b) is ended by end symbol.

After implementation main functions for instructor flow diagram by using mentioned technology tools we designed this flowchart (Figure 7). At the beginning, instructor can visit head department to add his/her name and id. The head department sends instructor name and id to administrator. The administrator adds instructor id and name to e-learning database system.

Instructor can input name and id, the system check his/her name and id with database if already exist can fill up registration form to choose login name and password at this time the system create cookies for this name to protect instructor name if does not exist the system display the message for instructor. If instructor wants to login, input login name and password the system check your login name and password with database if correct create session for this name and directly logon to the system. After login instructor can add/display/delete functions for instructor interface that described in the instructor flow diagram. If instructor forget password can answer security question to see his/her password. If student want to change password he/she can do. According to the flowchart to execute any operation the system can display the message about the result operation.

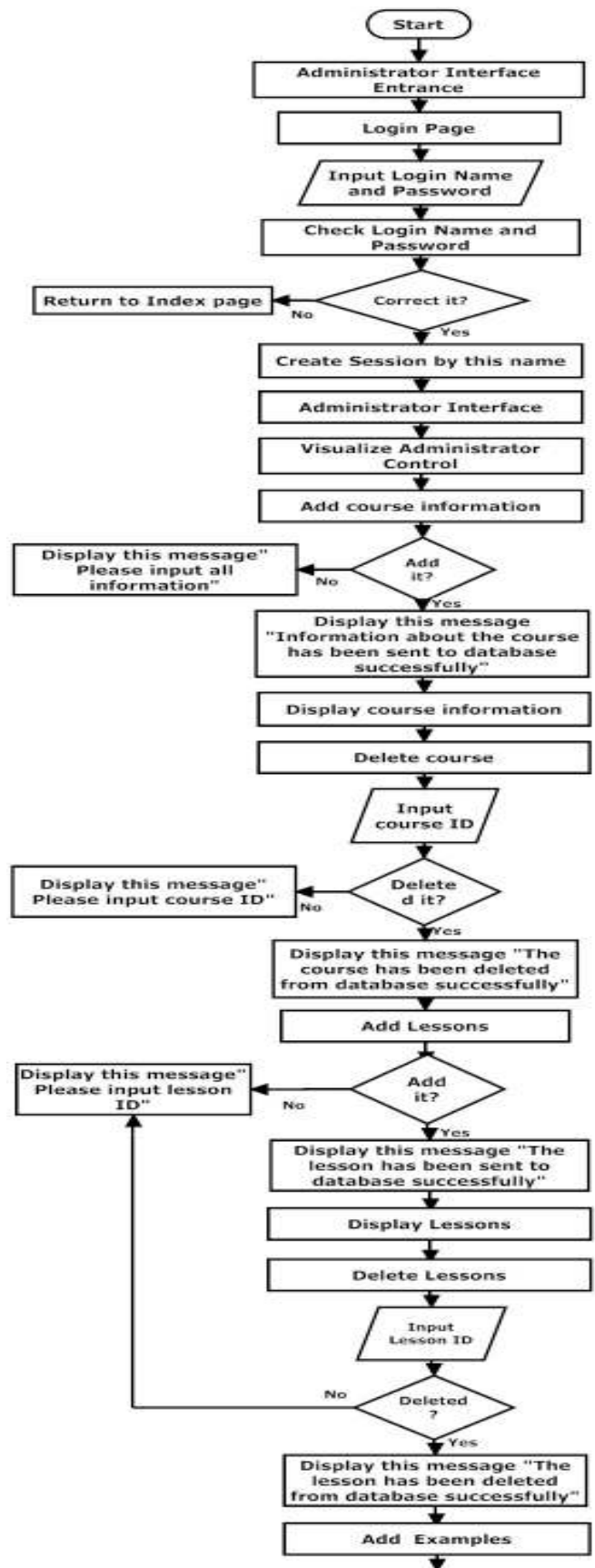
5.3. ADMINISTRATOR INTERFACE FLOWCHART

The flowchart for administrator interface is very big is divided into three parts (a),(b) and (c). Part one is (a) is started by start symbol ,part two (b) is started by decision symbol and part three (c) is ended by end symbol.

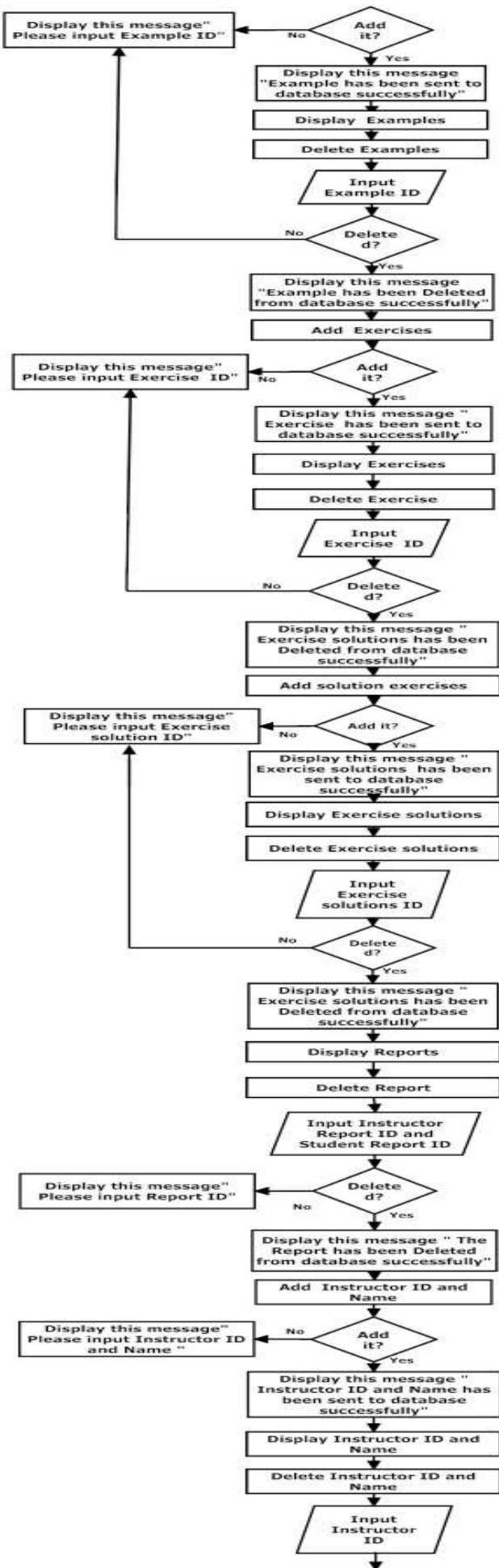
After implementation main functions for administrator flow diagram by using mentioned technology tools we designed this flowchart (Figure 8). At the beginning, administrator enter login name and password if does not exist directly return to the index page if his/her name exist directly logon to the administrator control panel.

First time administrator add head department to e-learning database system because head department can send other instructors id and name ,students id and name to administrator but the other instructors can not. According to the main functions for administrator flow, administrator can do everything such as add/display/delete for the following (courses, lessons, examples, exercises, exercise solutions, instructors id and name, students id and name) and administrator can see log files for instructors and students.

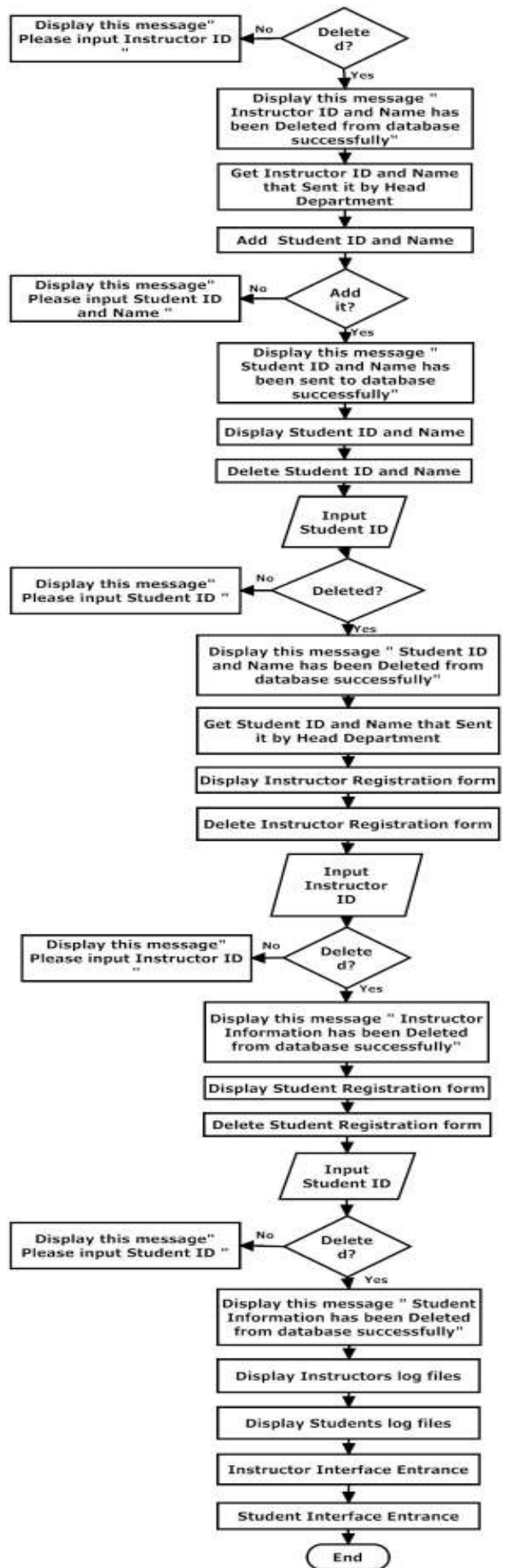
According to the flowchart to execute any operation the system can display the message about the result operation.



(a)
Figure 8: (a), (b), and (c) Implementation flowchart for administrator interface



(b)



(c)

6. DATABASE DIAGRAM FOR PROPOSED E-LEARNING SYSTEM

In this diagram we designed tables and relational tables that make up e-learning database system. E-learning database contain data about administrator interface, instructor interface and student interface.

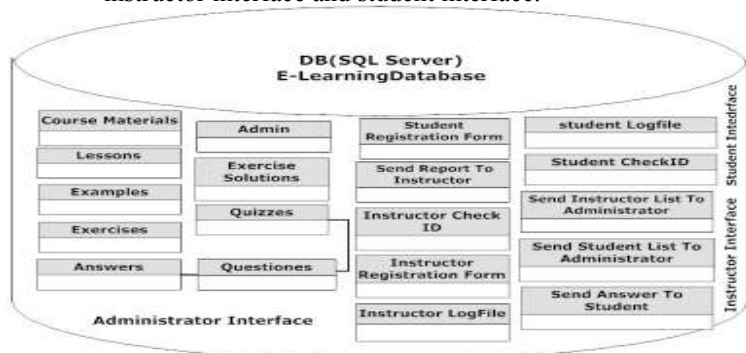


Figure 9: Database diagram for proposed e-learning system.
Table 1: Describes information about DB tables.

Table name	Description
Course materials	Contain data about courses.
Lessons	Contain data about lessons.
Examples	Contain data about examples.
Exercises	Contain data about exercises.
Exercise solution	Contain data about solutions.
Admin	Contain data about administrator.
Quizzes	Contain data about quizzes.
Questions	Contain data about questions.
Answers	Contain data about answers.
Student registration form	Contain data about students.
Send report to instructor	Contain data about student report
Student log file	Contain stored information about students.
Student check id	Contain student id
Instructor check id	Contain instructor id
Instructor registration form	Contain data about instructors.
Instructor log file	Contain stored information about instructors.
Send instructor list to administrator	Contain data about those instructors; they want to add to the system.
Send student list to administrator	Contain data about those students; they want to add to the system.
Send answer to student	Contain data about student answer that sent it by instructor.

7. DISCUSSION

In this paper, we proposed an e-learning system in order to increase learner's efficiency by stimulating learner's motivation and collecting lectures of all instructors are inserted to the system and providing extra information about the lectures like videos, presentation files or any other files and providing some interactive functions. The proposed system has three interfaces: administrator interface, instructor interface and student interface. We

verified the system performance by using some questionnaires and experiments. The proposed system was evaluated with good scores for learner's motivation and interactive functions. Improvement of teaching materials is also necessary to stimulate learner's motivation.

8. CONCLUSION AND FUTURE WORK

It can be concluding that e-learning is especially important as a learning environment to facilitate and to improve the process of learning, centering it over the student's needs. In this paper illustrates how flow diagrams and flowcharts are based e-learning system works for teaching, learning, and administrating and system development. In the proposed system design, three basic flow diagrams work together to present dynamic e-learning activities. The evaluation of this improvement is significant by student's feedback and average score for the course. It is obvious that e-learning system can provide a better strategy and understanding for teaching, learning, administration and system development. We believe that e-learning will become one of most important means for future education, especially for the university. In the future work, we want to deal with the following:

- 1- E-learning system security.
- 2- Providing a ranking function for instructors to improve their teaching efficiency.
- 3- Design and implement of asynchronous e-learning systems with the use of Java technology.
- 4- Towards from e-learning to m-learning.
- 5- Marketing for e-learning system.

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