

**DESIGN OF E-SCHOOL SYSTEM: A CASE  
STUDY OF IRAQI SCHOOL IN KUALA  
LUMPUR- MALAYSIA FOR DISTANCE  
EDUCATION PURPOSE**

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**Abstract:-**

Problem statement: As educational technology becomes more prevalent in higher education, teaching is no longer restricted to face-to-face (F2F) instruction. For university courses, the combination of e-learning technology and F2F teaching has increased accessibility, flexibility, and choices for students-lecturers interactivity. So e-Learning could be included in the curricula and learning strategies to assist in the implementation of the learner and is not confined to the classroom. Educational web-based learning has many advantages over traditional techniques (Barnett, 1996), as cited in(Pang, Wah, Keong & Mohamed, 2005).There are many primary and secondary students in Iraqi school in Kuala Lumpur- Malaysia Those students who live in the other States away from Kuala Lumpur could not communicate with the daily educational curriculum of this school, because of the distance between Kuala Lumpur and other states in Malaysia. In Iraqi school in Kuala Lumpur, the students who live outside of Kuala Lumpur register themselves at the beginning of the school year. They will be given all the materials (books, notes, etc) needed to the year for them to study on their own for the year. There is no interaction with the educational curriculum on a daily basis due to the distance, and not enough teachers. Students will only come at the end of the school year to perform the final examination. In the research case study, availability problems come into sight because the students need the teacher on a daily basis to give them the

lectures, and assessments for them to understand the lessons properly. By designing of this web site it will allow these students to communicate on a daily basis with the educational curriculum. That will represent a solution to this problem. The efficiency of interaction is one of the most important things for the students who register in this school. These challenges are increasingly need to develop e-school system, "anywhere, anytime," that student's can access to these websites. The accessibility of admissions offices, libraries, computer labs, counseling and tutoring centers, and other student services increases in importance (Burgstahler, 2008). **Cause:** There is no efficient interaction and communication between the students and Iraqi school in Kuala Lumpur. **Effect:** if students did not communicate with the education curriculum for Iraqi school in Kuala Lumpur that leads to low levels of academic and scientific for these students, which will lead to difficulty the students in passing the final exams and thus lead to the student's failure in this year. That will leads to the small number of students who want to register at the school in the past to future, which will lead to a few low-level scientific for this school.

**Key words:** E-School educational systems, web-based systems, interactive applications

## INTRODUCTION

Information communication technology offers new possibilities for improving existing education system .Distance education method carries numerous possibilities in every organization of education process from almost unlimited, time and space, communication possibilities to learning methods. Having that in mind, it is important to find the best possible provision of new methods and sufficiently in according to the conditions and needs, incorporate in education system. Moreover, information and communication technology is

essential part of modern education, notably because of numerous possibilities and advantage which that technology brings to education, as well as for better achievement of setup education goals (Vuksanovic, Zovko-Cihlar & Boras, 2007).

The history of communication technologies includes mail, telegraph, telephone and the internet. However, the internet is the latest in a long succession of communication technologies (Odlyzko, 2001). These communications technologies have played an important

role in providing facilities to people in different aspects of life. The spread of the internet was the biggest role in the process of progress and thus to be deployed a lot of sites on the internet as well to achieve greater interaction between users and owners of these sites, whether personal, governmental sites or organizations, etc. One of these technologies is E-learning.

In this research project we have introduced the web-based "E-School" system, which can be used with any school courses. The proposed system has the following functionalities and features:

**Knowledge evaluation:** Students can evaluate their understanding levels and teachers can track the activities of their students and can guide them to reach the pre-determined objectives of the courses.

**Question generation:** Teachers can store many types of questions like multiple choices, true/false and fill in the blanks.

**Communication:** The system has a communication tool that allows students and teachers to interact together and discuss their activities.

**Course management:** The system is highly flexible and doesn't necessitate any programming skills from its potential users. Thus, teachers can add, delete and update their course materials at any moment through the web.

**Student information database:** The system allows the schools to create an information database that stores for all student.

### METHODS

**System overview:** The scenarios are description of the system as seen by a user. It is a non-formal way of describing the system and is helpful in gaining insight to which behavior and functionality the system should offer (Egeberg, 2006). The following scenarios describe how manager, teacher and student would use (E-School) system. The system is divided into three applications, called manager, teacher and student application. As shown in Fig. 1.

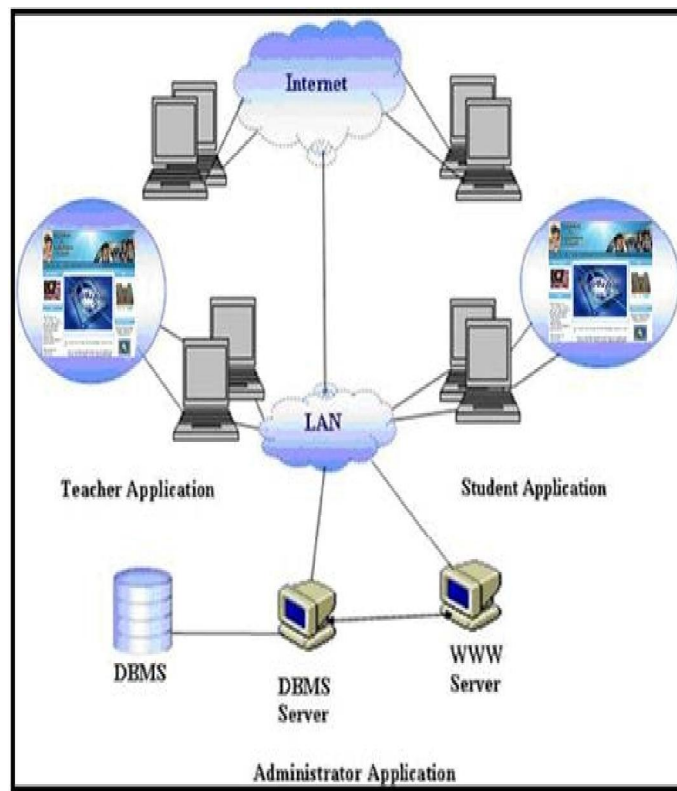


Fig. 1: System overview

**The manager application:** This application

provides the school manager with simple tools to manage the information of the E-School system. The following are some features provided by the manager application:

- Manager of school needs to login first.
- Activate/Inactivate the system.
- Manager of school can manage all students information (Add, Update, Delete and Search).
- Manager of school can manage announcements (View, Add, Send and Delete).
- Administer the basic information of the system such as: Levels data, subjects or courses data, classes' data, teacher's data and students' data.
- Manager of school can search about teachers and students by Name of them.

**The teacher application:** This application provides the teachers with various tools to construct the system services. The following are some features provided by the teacher application:

- Teacher needs to login first.
- Change account password.
- Teacher can manage announcements (View, Add, Send and Delete).
- Teacher can search about students by MatricNo and Name.
- Manage (add, update, upload classes, delete and display).

**The student application:** This application provides the students with interactive tools to use the services of the system. The following are some features provided by the student application:

- Student needs to login first.
- Change account password.
- Download assignments, classes, revision documents, previous exams and other files that are uploaded by the teachers.
- Student can view announcement.
- Student can send online question.
- Student can search about teachers and other students by use the Name.

**Research Design Methodology:** Design Research is the research methodology used in this study is an accepted among many researchers in Information System.

According to (Vaishnavi & Kuechler, 2004), the design research methodology includes the major steps as shown in Fig 2 these phases are:

- **Awareness of Problem:** In this stage the most important thing in the methodology is the understanding the objectives and the scope, and also the problems. So, the awareness of the problem in Iraqi school in Kuala Lumpur-Malaysia in no efficient interaction and communication between teachers and students. After that the problem statement, the objective and the scope will be clear.
- **Suggestion:** The suggestion to solve the problem is to design web site to enhance interact and communicate between the Iraqi school and the students by using Usability Guidelines framework, so the students can easily

interaction with teachers anything. The output of this phase is the temporary Design. The analysis and design of the system includes UML diagrams. The UML diagrams are general use case diagrams, detailed sequence diagrams for each use case, and class diagram.

- **Development** : The prototype will be developing by using ASP.net (Microsoft Visual Web Developer Express Edition (C#)) programming language environment. In this level the design e-school system Prototype will be developed. Also we will develop the web site by using requirement of Usability Guidelines.
- **Evaluation:** Web site evaluation is an important step in IS development to assess and improve the quality of the web presence of a company or government body.
- **Conclusion:** Designing e-school system that is responsive to students needs is a critical prerequisite for success. However, if we actualized usability requirements in my research, it will make the web site more efficient and easy to use. The goal of this research is to enhance and facilitate the interaction between students and Iraqi school in Kuala Lumpur.

#### **Methods and techniques:**

**Scenarios:** The scenarios describe how manager, teacher and student would use (E-school) system. This will help to gain in the problem domain and elicit requirements the system has to meet.

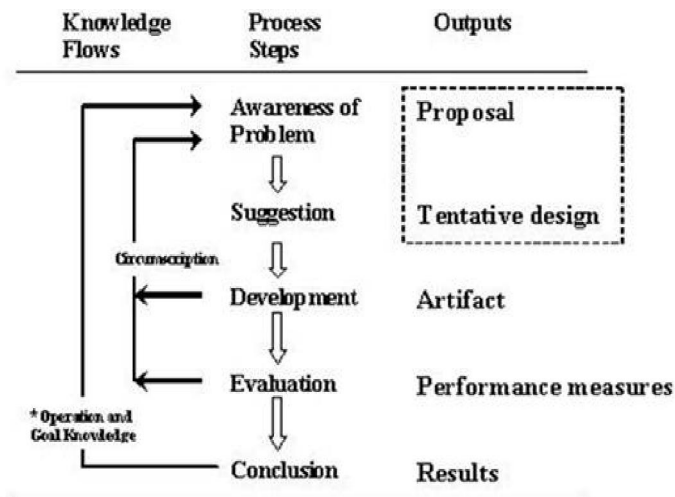


Fig. 2: Research Design Methodology (Vaishnavi & Kuechler, 2004)

**Use-cases:** The use cases are more formal methodology means to show how the functionality the system offers meet some need of the user. They are not meant to indicate how the communication between participants of the system is, but rather a tool to identify the functionality the different actors have to offer (Egeberg, 2006). Use case is a functional requirement that is described in terms of users of a use case defines a functional requirements system. That described as a series of steps, including actions by a system and interactions between the system and actors.

**Class diagram:** According Martin (2003) class diagrams are the basis for object-oriented analysis and design. The purpose of a class diagrams to represent the classes within a model. In an object-oriented application, classes have attributes (member variables), operations (member functions) and relationships with other classes. The UML class diagram can illustrate all these things fairly easily. Moreover Class diagrams show the classes of the system, their relationships (including inheritance, aggregation and association), and the operations and attributes of

classes. So Class diagrams are used for a wide range of uses, including conceptual / domain modeling and detailed design modeling.

**System Architecture:** The Student can access to E-school system of Iraqi School in Kuala Lumpur – Malaysia by using the website to do their demands. For example, the students can view class that uploaded from teacher and send online question after that can receive the answer from his teacher by using this website. So we can discuss the system analysis, The analysis phase is the chief phase in which the system requirements are identified in more details. The goal of this phase in the system development is to refine the system goals into defined functions and operation of the intended application. System requirements are documented in a complementary set of artifacts: flow charts use case diagrams, system sequence diagrams and so on. Each artifact provides a different perspective of the system under design and contains distinct requirements. The combination of these perspectives establishes the tasks that are to be accomplished by the system.

**Interviews:** Interview was be conducted with the head of Iraqi School to find out what exactly is the problem in the school curriculum and what are the challenges that the students will faced since there are no efficient interaction between them and the teacher. Also the interview are conduct with Iraqi students who are studying at University Utara Malaysia (UUM) and University Sains Malaysia (USM) who has brought their families along and are having difficulties in giving education to their children.

**Prototyping:** The prototype will be developed by using ASP.net programming language environment(C#). Microsoft.NET Framework provides developers with the opportunity to create and deploy applications and services via

the Web. These services can facilitate communication between clients and .NET application servers through the use of XML queries issued by the client. This environment is attractive to developers because it is a language-neutral environment that can deliver content to end users, regardless of the platform in use (Road, 2002). In this level the design e-school system Prototype will be developed. Also we can develop the web site by using requirement of Usability Guidelines.

**Use case:** The use cases are more formal methodology means to show how the functionality the system offers meet some need of the user. They are not meant to indicate how the communication between participants of the system is, but rather a tool to identify the functionality the different actors have to offer (Egeberg, 2006). A use case and measurable value of actor to provide something that describes a series of actions can be made as a horizontal ellipse (Ambler, 2004). Using use cases to determine

Requirements could be classified in two types: Functional and Non-Functional requirements.

**System requirements:**

**Functional requirements:** Functional requirements are intended to capture the anticipated behavior of the system. The environment includes the end user and any other external system with which the system interacts. The E-School system should allow different types of users to interact with the system according to given privileges. There are three main users, school a manager, teacher and student. It provides various services for each one:

- E-school system allows the school A administrator to:
- Login (as a manager).
- Change account password.

- Get new password instead of the lost one.
- Activate/Inactivate the system.
- Renew data (Import the data from the SQL server database, delete data from specific table).
- Manage (add, update, delete and display) the basic information of the system
- E-school system allows the teacher to:
  - Login (as teacher)
  - Change account password
  - Manage (add, update, delete and display) all the system services.
- E-school system allows the student to:
  - Login (as student)
  - Change account password
  - Get new password instead of the lost one
  - Download a class and other files that are uploaded by the teachers.

**Non-functional requirements:**

The non-functional requirements will capture properties of the system that has to do with performance, quality or features that are not fundamental for the system to work. They are however very important because they are often properties that highly desired by the user and can help the system gain competitive advantage over other systems. The list of the nonfunctional requirements for the system is as follow:

- **Security:** This will be guaranteed by assigning different privileges to different users.

- **Reliability:** Availability of the system. And Rate of failure occurrence very low.
- **Flexibility:** The database of this system is flexible, to support and store large number of data needed by manager.
- **Portability:** This system is portable where user can use it in any operating system like Microsoft Windows XP Professional, Linux, and UNIX.
- **Maintainability:** The developer can update and maintain the system in the future.
- **Speed and real time:** By using the E-school System, activities like learning interaction between students and teachers will be increase. This system can be used at anytime, anywhere.
- **Navigation** The system offered the opportunity to go to other parts of this application such as the student can transfer from view class to view announcement with easily and speedily.
- **Help & Support :** Support workflow in the system and support the user to fulfill their missions.
- **Error handling:** Errors are avoided as much as possible.
- **Easy to use:** The graphical user interface has to be easy to understand.

**Hardware requirements:** The system needs high quality hardware in (CPU, RAMS, Hard Disk, etc...) to execute it.

#### **Software requirements:**

- **Operating System**  
Microsoft Windows XP Professional.

- **Database**

This component uses to store the information; the prototype uses Microsoft SQL Server 2005.

- **Microsoft Visual Studio 2005**

This component is essential to run the ASP.NET 2.0 web sites.

- **Microsoft .Net Framework SDK v 2.0**

Microsoft visual studio required this framework.

**System models:**

**Scenario:** The scenarios are description of the system as seen by a user. It is a non-formal way of describing the system and is helpful in gaining insight to which behavior and functionality the system should offer (Egeberg, 2006). The scenarios describe how manager, teacher and student would use (E-school system). This will help to gain insight in the problem domain and elicit requirements the system has to meet.

**Manager of School:** Manager of School will enter the web site through his own ID and password, then the system will check the authorization of manager entry, after that the manager will be able to complete his tasks Add, Delete, Update, Search, View and Send announcement .

**Teachers of School :**Teacher of School will enter the web site through him own ID and password, then the system will check the authorization of teacher entry, after that the teacher will be able to complete him tasks such as Upload class, View and Send announcement, Answer online question, Search about students.

**Students of School:** The student can enter the website by using his own ID and password, and then the student can start using the system. They can complete all their tasks such as downloading classes that has been uploaded by the teacher, view announcement sent by the teachers and manager of school, send online question to the teachers, and search about other students or teachers.

**Developer of system:** The developer can enter for this website by using his own ID and password, for each system is

very important to available developer to maintain and update the system in the future. Because may be occur to the system in the future some problem, to solve it should be available developer to process this mistaken in the system.

**Database design:** This study uses Microsoft SQL Server (2005) because there are many features in it, which includes in the following:

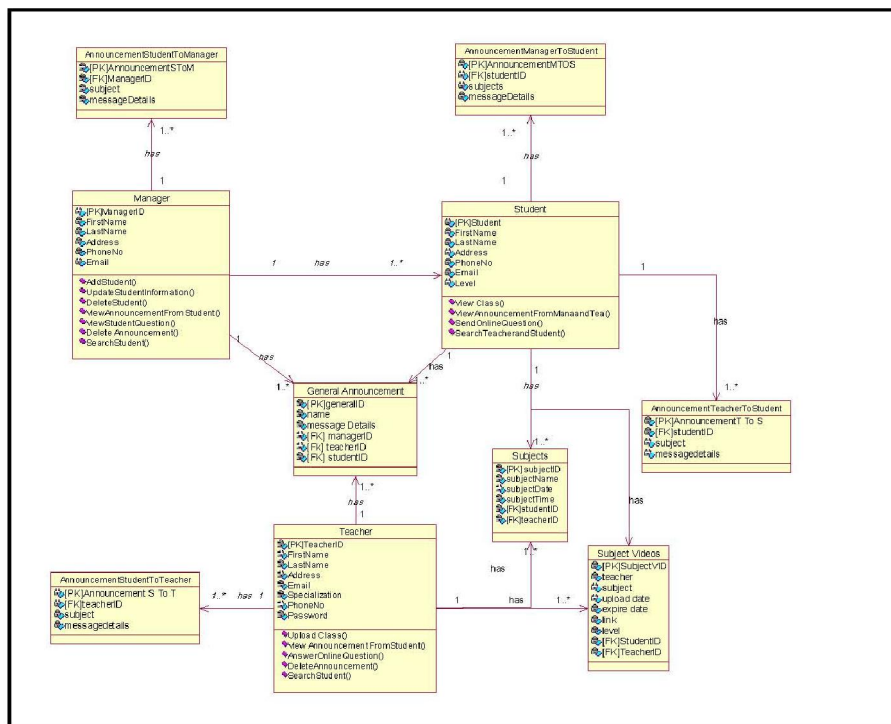
- The Microsoft SQL Server 2005 allows of users to create tables, queries, forms, reports, pages and modules.
- Tables are grids that store related information.
- Queries ask questions of the database to help locate specific information.
- Another software feature of Microsoft SQL Server 2005 is its support of a variety of data formats.
- It is also possible to post information such as forms and reports on the Web, so that people in remote locations may view the required information.

The database of the system (E-school: system) consists of eight tables, these tables are:

- Manager Table.
- Teacher Table.
- Students Table.
- Subjects Table.
- AnnouncementStuToManager Table.
- AnnouncementStuToTeacher Table.
- AnnouncementManagerToStu Table.
- AnnouncementTeacherToStu Table.
- General Announcement Table.
- SubjectVideos Table.

**System Development:** ASP.Net (Microsoft Visual Studio 2005) is used in this study to develop the prototype “Design E-school System: a Case of Iraqi School in Kuala Lumpur – Malaysia for Distance Education Purpose”. ASP.Net was called a server side programming language. “Server-side programming is programming that is done where the code is executed on a server” (McMahon, 2005). In these programming languages the code is executed when a request is received from a client, and it creates code that Web browsers understand (HTML) and sends it back to the client.

Also the research uses Usability Guideline (UG) to develop the system.



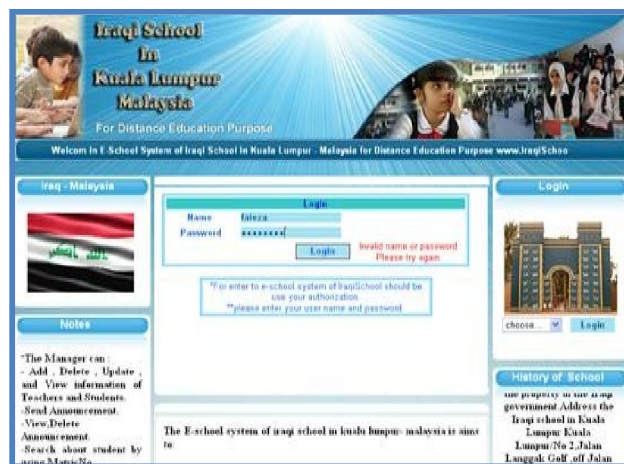
**Fig. 3: E- School System of Iraqi School in Kuala Lumpur – Malaysia for Distance Education Purpose Class Diagram**

**Using Usability Guideline (UG) in System Development:** Usability Guideline (UG) using in this study to develop the system. This usability guidelines that are specific to online interfaces (Department of Industry, Tourism and Resources and The Hiser Group Pty Ltd, 2006). I mentioned to the main points in this guideline in previous chapter. This section refers to use this usability guideline in prototype development.

- Make it easy for users to find the forms: The user can access to any form from the short cuts menu in home page. Also each page in the system provides users by menus as short cuts to any form.
- Encourage user trust: The spelling and grammar have been reviewed in the system (E-School System:ISKLM). Also the links throughout the form have been reviewed to rectify any broken links. The user can print his information by press one click in bottom print in his page.
- Create a good first impression: The system does not use embedded fonts in PDF files; because these fonts are enlarging the size of the file. Also all forms are clearing to user if he/she wants to use it. These forms do not contain huge information.
- In designing forms has been avoided using ‘Submit’ inside the system as some users feel this language is this too technical, unfriendly or authoritative.
- **Create** a flexible design which will support the needs of deferent users: The system provides picture of printer as in his pages to allow to the users to print the forms.
- Provide users with a quick, efficient workflow: The system uses screen controls such as Drop-downs control and Check boxes control it is easier to the users to enter the data.
- Style of language: All texts and labeling used throughout the system is as brief as possible without losing clarity of meaning. The forms of the system used ‘send’ instead of

‘submit’, and used ‘required fields’ instead of ‘mandatory fields’. The messages in the system used positive language.

- The system uses screen controls in the designing of forms. For example in the page of “online question” the system uses drop down list to choose the name of teacherID, teacher name and subject name. Also the system uses check box to allow to the students to select multiple options of each teacher in the form of send online question.
- Each pages contained related data.
- The system used red bold text for error messages. For example when the user enters invalid username or password, the system appears red bold message to inform the user about the error. Figure 4. illustrate this message:



**Fig. 4: Red Bold Text for Error Message**

- All forms uses the data entry fields are high and wide enough to allow to the users to see the entered information.
- Readability: The pages of the system use legible texts. Also it avoids using blocks or rows of text that is all capitals or all italics because users find this more difficult and slow to read.
- Accessibility: All users can access and complete the form.

- Error Handling: The designer indicates to the users if any fields are mandatory; for example in add new student form all fields are mandatory if admin forget any field the system informs admin about the error. Figure 5. illustrate this case:



**Fig. 5: Inform User about Mandatory Fields**



**Fig. 6: Home Page**

### Design Interfaces for E-school System Prototype:

This system has many pages according to the requirements of this system, these pages as following:

- **Manager Pages**
  - Home Page.
  - Login Page.
  - Manager Page.
  - Add New Students Page.
  - Update Manager Information Page.
  - Add New Manager Information Page.
  - Delete Manager Information Page.
  - Search Students Information Page.
  - Send New Announcement Page.
  - Delete Announcement Page.
  - View Students online question Page.



Fig. 7: User Login Page



Fig. 8: Admin Home Page

- Teacher Pages
- Home Page
- Login Page
- Teacher Page
- Upload Class Page
- View Online Question Page
- Answer online Question Page
- Search Student Information Page



Fig. 9: Teacher Home Page

- Student Pages
- Home Page
- Login Page
- Student Page
- View Announcement Page
- Delete Announcement Page
- Send Online Question Page
- Update Student Information Page
- Search Student Information Page



Fig. 10: Student Home Page

## DISCUSSION OF RESULT

There is very important to discuss the evaluation of the Design E-school System: A case of Iraqi School in Kuala Lumpur – Malaysia for Distance Education purpose developed prototype. As motioned before that to usability test that is dependent on Usability Guideline of Department of Industry, Tourism and Resources and The Hiser Group Pty Ltd. The Evaluation Questionnaire was designed according to the Likert Scale. According to Ubersax (2006) Likert scales were first developed by Rensis Likert, a sociologist at the University of Michigan from 1946 to 1970. Likert relates to the measurement of psychological attitudes and hopes to do so in a "scientific" way. This Questionnaire divided to six parts, each part contains many questions. Also the interview is used with the manager of Iraqi School in Kuala Lumpur -Malaysia in order to gain more insight into the Teacher actions with the system.

**1-Evaluation Techniques:** The evaluation was achieved after the system has been developed to verify the level of the usability operability of the system; it is tested through a questionnaire which was distributed to the students' of Iraqi School in Kuala Lumpur - Malaysia. The sample size was 40 students. Each respondent was given a brief description of the functionality of system. Afterwards, they were allowed to use and explore the system, finally were given a set of prepared questionnaire to obtain their perceptions. The aim was to see the level of the prototype usability.

**2- Evaluation Questionnaire:** The questionnaires questions which were used in this study have been adopted depend on Usability Guideline of Department of Industry, Tourism and Resources and the Hiser Group Pty Ltd. It consisted of six main sections, firstly general information of respondent (Respondent Profile). The second section included questions about the user experience. The third section included questions about moving around the form (navigation, workflow & orientation). The fourth section included questions about reading the Site (Written Content). The fifth section included questions about viewing the site (Layout & Presentation).

Finally, section six includ questions about the interaction design; the questions were close ended and scaled from "Strongly Disagree" to "Strongly Agree".

**3- Data Analysis:** The data collected through the questionnaire has been analyzed using SPSS software, version 12.0. Different statistics were used for data analysis.

**Item-Total Statistics:** One of the most important for questionnaire reliability is: the scale if item deleted. And as 0.7 is seen as good value for alpha (Field, 2006) .If questionnaire is reliable, there is no any one item to greatly affect the overall

reliability, and then the value of Cronbach's alpha will be around 0.7 or higher if that item were deleted.

**Summary Item Statistics:** Table 1. illustrates the mean, minimum, maximum range and variance for all items in the questionnaire.

	Mean	Minimum	Maximum	Range	Maximum / Minimum	Variance	N of Items
Item Means	4.1189	3.500	4.4250	.6750	1.1494	.204	37

**Table 1: Summary Item Statistics**

## CONCLUSIONS AND RECOMMENDATIONS

**Conclusion of the Study:** The objective of this study is to design and develop a Design E-School System: A Case of Iraqi School in Kuala Lumpur –Malaysia for distance Education Purpose. The prototype helps staff of Iraqi School and students to do their demands easily anywhere at any time using an E-School system. The system increases the interaction between them.

**Study Contributions:** After designing and developing E-school System: a Case of Iraqi School in Kuala Lumpur - Malaysia helps the Manager, Teacher and students by gaining an easier way to make their demands by providing them with the necessary functionalities in this system and increase the communication ways between them. The prototype was developed using ASP.NET with C# in coding the E-School system. In this study appeared how the users (Manager, Teacher and students) can make efficient interaction between them when they use the system. Microsoft SQL Server is used to make the database that stores the required information in the system.

**Limitations:** Although this system allows to the users (Manager, Teacher and students) easier way for efficient

interaction, and the many features in the Microsoft SQL Server as database; that is more appropriate with the online applications. There are some significant shortcomings in application this system in real world, which include: In case of apply this system in as real world will face some difficulties when the young students using it because of their weakness in English, in spite of the numerous illustrations available in this system.

But these difficulties will be temporarily and could end quickly when the students are using the system daily will be simple and easy to use for them.

**Future Works:** The E-School System: A Case of Iraqi School in Kuala Lumpur – Malaysia for Distance Education Purpose is to enable the students to communicate with Staff of Iraqi School more efficient and organized. Future works as listed in the following:

- Expand system functions to cover all primary and secondary school in Malaysia and other countries.
- Upload the system on the server to test it in real world.

**Recommendations:** Actually no one can deny the importance of the E-school System in different aspects of our life and in our studies. So should be make the use of the E-school System to be applied extensively because it is make everything easy and fast to be done in anywhere and anytime.

### **Abstract**

Since Iraqi students who lives outside of Kuala Lumpur are having communications problems with the daily educational curriculum set by the Iraqi school in Malaysia, designing an e-school system prototype for the primary and secondary Iraqi school in Kuala Lumpur- Malaysia is proposed. This research will use Usability Guideline as an aid in designing the system and the research methodology has been used in this study which is Research Design (Vaishnavi & Kuechler, 2004) an agreeable

method, excellently chosen, described and accepted among many researchers in information system. The system is developed by using ASP.net (Microsoft Visual Web Developer Express Edition (C#)) programming language environment. The design in this website will increase the efficient interaction and communication between teachers and students and will lead them to obtain better results in education. Moreover, it will also become very helpful learning tools where they can show the teachers, check notes, read announcements, download lectures and files.

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