

# **Development of a Web-based Student–Lecturer Relationship Information System(E-Assessment)**

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## **ABSTRACT**

Student and lecturer interacts everyday in one way or the other either in classes, supervision of projects, assignments and other areas other than academics. Most especially, when given assignments, some students may not get to know of the assignment on time before the deadline for submission, hence, the need for a web – based interactive information system that enables both student and lecturer to be flexible in their academic interaction. In this system, the lecturer can post an assignment and the student can check for the assignments, do them, submit and later go back for check for his/her grades. User interface is implemented in C# and ASP.NET languages. WWW access to the system ensures platform independence i.e. the system can be accessed using an ordinary internet browser from any computer platform.

## **Keywords**

Internet, WWW, education, e-commerce, assessment, e-learning

## **1. INTRODUCTION**

The impact of Computer Technology on the society is growing at a high speed in recent time. Digital communication networks now covers the globe and even reach out into the space. Coupled with the rise in Computer “connectivity”, the physical system of organization across the world is becoming increasingly integrated and interdependent [1].

The emerging use of TCP/IP networking has led to a global system of interconnected hosts and networks that is commonly referred to as the Internet [2]. The Internet was created initially to help foster communications among government-sponsored researchers and grew steadily to include educational institutions, government agencies, and commercial organizations. In fact, the Internet has experienced a triumphant advance during the past decade. Today, it is the world’s largest computer network and has been doubling in size each year. With this phenomenal growth rate, the Internet’s size is increasing faster than any other network ever created, including even the public-switched telephone network (PSTN). Early in 1998, more than 2 million Web servers and more than 30 million computer systems were connected to the Internet [3] and these numbers have steadily increased meanwhile. Consequently, the Internet is may be seen as the basis and first incarnation of an information superhighway, or national information infrastructure (NII) as, for example, promoted by the U.S. government.

The World Wide Web (WWW) and Web-based applications are the virtual network that are overlaid on the Internet. They comprise all client and server systems that communicate with one another using the Hypertext Transfer Protocol (HTTP). HTTP, in turn, is a simple client/server application protocol that is layered on top of a reliable transport service, such as provided by the Transport Control Protocol (TCP). The protocol defines how WWW resources may be requested and transmitted across the Internet [4].

Education is a term that has been defined from a variety of perspectives: descriptive, prescriptive and etymological. According to Professor Ivo Leke Tambo [5], Education descriptive is defined as the process by which people acquire knowledge, develop abilities, skills, attitudes and forms of behaviour that are useful to themselves and their society. Education can be acquired in informal settings (as within the family), in non-formal setting (as in training programmes) or in formal settings (as in a school). For the purpose of this paper, It would better to make a distinction between education and schooling. Schooling is a subset or a component of education. It is one way by which people (student) obtain education and at interval, they have to be assessed.

Assessment as it relates to education or schooling, according to Linn and Gronlund [6] consists of all the procedures and strategies that are used to obtain information about student learning. The result of an assessment is a value judgment on what is being assessed. With respect to student learning such a value judgment could be: pass, fail, excellent, very good, good, fairly good, poor and so on. It is important for our purpose to make a distinction between an assessment and a test. A test, often called an examination, is one form of an assessment. It usually consists of a set of questions that are administered during a fixed period of time under reasonably (supposedly) comparable conditions for all learners [6].

This student – lecturer relationship information system is a web-based application that helps both students and lecturers to interact. It helps the lecturer to post his/her assignments while the student can access it and solve the assignment given and post it back anytime, anywhere via Internet.

## **2. BACKGROUND**

Assessments methods emanate from the specific learning objectives of a subject, hence assessment should be included in the planning of teaching and learning. Assessments can be designed as an ongoing process (formative) or they can be designed to be used at the end of a prescribed period of learning (summative). Varying assessment strategies will also ensure accommodation of the different learning styles. Classroom presentation naturally suits verbal/linguistic learners as it requires students to verbalise their knowledge. Visual learners are likely to achieve higher in assessments which include pictures, videos, diagrams, maps, etc as those will help them figure out responses. Assessments involving analysis or problem solving will benefit logical/mathematical learners whereas kinaesthetic learners will do well in fill-ins and multiple choice questions.

### **2.1. E-Assessment**

The growth of technology is evident in the field of education where its use is almost inevitable in the delivery of learning materials. E-learning, which is the acquisition of knowledge and skill using electronic technologies like computers and the Internet, has become dominant in Higher Education. One of its domains, e-assessment, is gradually becoming more preferable than the traditional pen and paper method of assessment.

E-Assessment is one of the domains of e-learning. It refers to assessment which is electronically delivered. The Joint Information Systems Committee (JISC) defines e-assessment as the end-to-end electronic assessment processes where Information and Communication Technology (ICT) is used for the presentation of assessment activity, and the recording of responses [7]. Figure 1 shows the different categories of assessment.

### **2.2. Design of the E-Assessment Student – Lecturer Relationship Information System**

The Design of the E-Assessment Student – Lecturer Relationship Information System is inspired by Design Methodology Management (DMM) technology. The three key words: Design, Methodology, and Management which form this technology need to be understood before one understands DMM itself. Some definitions and descriptions of these from research are outlined below.

#### *2.2.1. Definition of DMM*

Zhu, [8] identifies two facets of Design as: firstly, a plan to bring about man-made product, with that plan aiming to achieve a prescribed goal and satisfy certain constraints; secondly, a process of the creative development of such a plan. He goes on to specifically define Engineering Design as the use of scientific principles and technical information in the creative development of a plan to bring about a manmade product to achieve a prescribed goal with certain specified constraints. In the same vein, Software Design is deemed a branch of Engineering Design where the product to bring about is software. Methodology refers to “the processes, techniques, or approaches employed in the solution of a problem or in doing something: a particular procedure or set of procedures” [9]. Fiduk, [10] defines methodology as a sequenced set of operations employed in performing a particular function such that, given a

methodology, the function can be performed in a predictable and repeatable way. Baldwin, [11] defines methodology as the sequence of tools, and he defines methodology management as the functionality of selecting and executing the tools. Kalavade, [12] states that a design methodology specifies a sequence (flow) of tools that operate on data. In the light of that description, he perceives that DMM deals with data, tool and flow management. McKnight, [13] defines Design Methodology as a sequence of activities required to get from one stage of the design process to another, summing it up as: Design Methodology = Tool Set + Design Flow + Constraints (i.e. its customization). Design Methodology Management (DMM) deals with the execution and control of methodologies used in the design process, in a flexible and configurable way. In other words DMM deals with the execution and control of the tools and tasks used in the design process. McKnight, [13] defines it as the management of a design methodology’s component parts, i.e. management of the toolset, the design flow and any required constraints or customizations. It addresses the need to manage the manner in which design tools are executed to achieve a desired function.

#### *2.2.2 Requirements of a Methodology Management system*

From the given definitions above, three main components of DMM are identified as tools, tasks, and execution and control. Tools need to be described and executed in a manner that is generic and extensible. The descriptions must be complete enough to meet the requirements for executing the tool. Users do not need to know the details of tool execution. Tool description must include data requirements, argument definitions, interactive tool command set characterization, resource requirements as well as function description. A designer must be able to construct short sequences of tools dynamically for debug purposes. Task descriptions must support sequencing of tools to be executed within the task; intra- and inter-task dependency definitions, e.g. output and input data relations; flow control constructs such as conditional branching, selection and iteration and also task portability to different design environments [14].

Users must be able to invoke tasks and tools, and monitor their states. This includes among other things, tool selection, automatic tool invocation, tracking and displaying the state of the task including the state of all related processes, recording all user interaction and tool and task processing, suspension and resumption of task execution, supporting queries on tool and task execution status and history and also back tracking and error recovery. See figure 2.

### **2.3 System Architecture**

The system is based on web technologies in order to be more universal when it comes to accessibility and usability. In this way, users access the system over the internet or intranet. The system consists of two parts – student and lecturer.

The student logs on to the application after registering, he/she gets his/her personal username and password which they use any time they want to make use of the application. The student can then check for any assignment posted by the lecturer on each course registered for, does the assignment, upload the database,

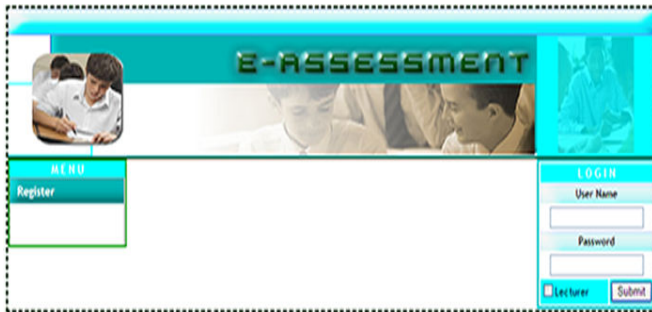
he/she can they log in again to check for marked assignments and the grades. The lecturer also logs in to register and gets a personal username and password, which he/she will use anytime he/she wants to use the application. The lecturer then posts his/her assignment to be given to the students. See figure 3

### 3. IMPLEMENTATION

E-assessment consists of a web server and a database server. Web server provides interface to users who access the system over the web while the database stores all information in the system. The application is implemented on windows platform. We used Microsoft's MySQL as the database server.

#### 3.1 System Access

To access the system, the user first registers either as a lecturer or a student, and also gets username and password for logging into the system. To access the main content of the application, the system performs authentication in which the user uses his/her personal username and password to log in. also the administrator of the system can also login into the system using his/her password.



**Fig 3.1: e-Assessment Login Interface**

The system administrator is the person in charge of maintaining the system, he adds, edit, and delete questions and answers posted onto the system to avoid a backload on the database server

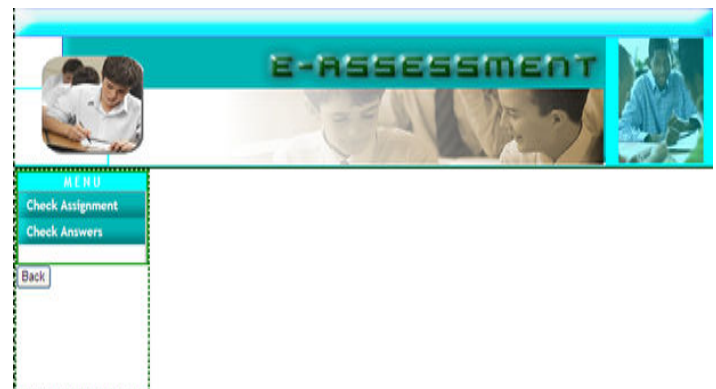
#### 3.2 Security Aspects

Security is a very important aspect in many applications of internet today such as e-commerce, e-medicine. E-assessment uses user authentication as a measure of protecting the system against unlawful use of the system. User authentication is performed by entering username and password information. The system provides different privileges for different users.

If a user registers as a student, you can only submit assignment (i.e. do your assignment and upload it into the system) and check new assignments and grades for already marked assignments.

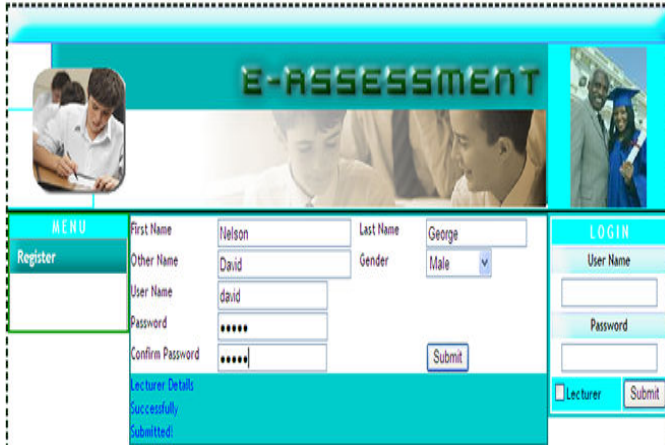


**Fig 3.2: e-Assessment Registration Interface**



**Fig 3.3: e-Assessment Check Interface**

If a user registers as a lecturer, you can only post assignments and mark the assignments submitted by the students.

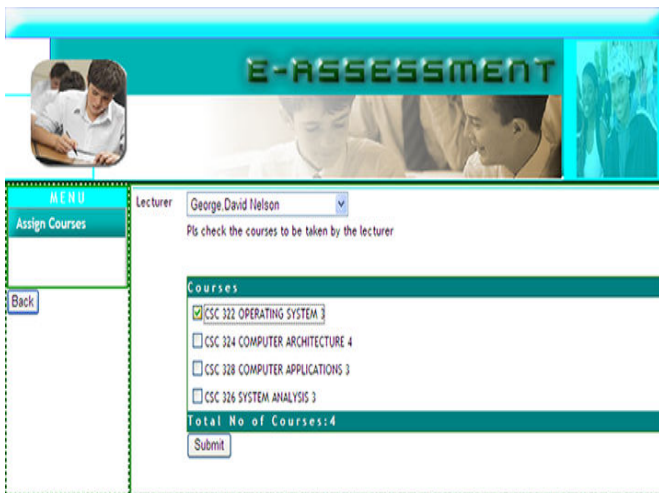


**Fig 3.4: e-Assessment Assignment Submission Interface**



**Fig 3.5: e-Assessment Student Assignment Interface**

The administrator is the only one that has full access into the system, he can add, edit and delete from the system. The system administrator assigns courses to lecturers before the lecturer can then post his/her assignment for each course.



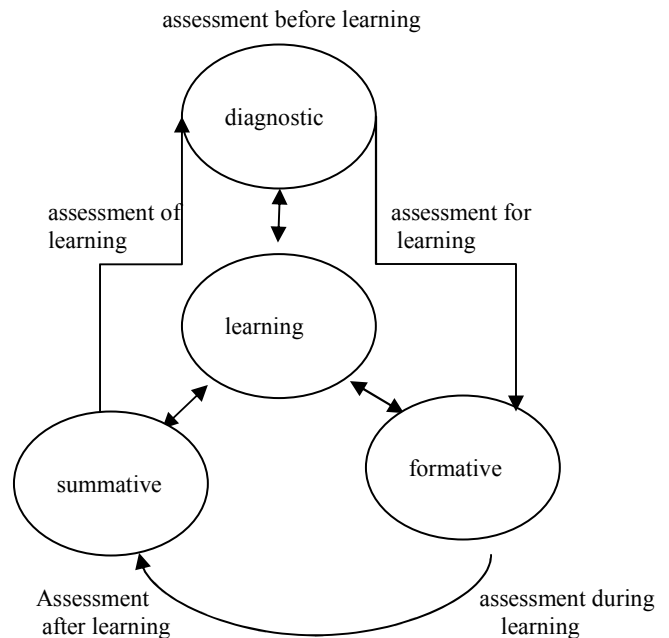
**Fig 3.6: e-Assessment System Administrator Interface**

#### 4. CONCLUSION

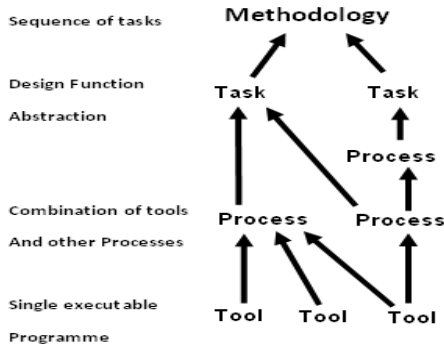
It is well known that assessment in the form of national examinations as well as classroom and promotion examinations have been commonly used in our countries to motivate lecturers to lecture and students to learn in the regular but fairly restricted schooling set up and thereby contributing to the enhancement of the quality of education in the schools. Therefore, within the context of a relatively restricted lecturing-learning environment the quality of the assessment system in our countries is not being called to question.

Here is a paper e-assessment, a web-based system for student – lecturer information system. E-assessment can be used to assess cognitive and practical abilities. Cognitive abilities are assessed using e-testing software; practical abilities are assessed using e-portfolios or simulation software. E-assessment is becoming widely used. It has many advantages over traditional (paper-based) assessment. These advantages includes: Lower long-term costs, instant feedback to students, greater flexibility with respect to location and timing , and improved reliability (machine marking is much more reliable than human marking).

The application helps to keep track of assignments given to students and it provides a way for student to have access to any assignment given to them by their different lecturers via Internet.



**Figure 1: Categories of Assessment**  
 (Source: Crisp, G., (2008) Interactive eAssessment. <http://online.waikato.ac.nz/blog/>, (10 April 2009))



**Figure 2: Design Methodology Management Framework**



**Figure 3: Student- Lecturer e-Assessment Web-Based Relationship Architecture**

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