

Open e-Test: Remote Evaluation of a Large Population of Students at University of Oran 1

Ahmed Ben Bella (Algeria)

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Abstract: *In order to ensure quality programs and courses in the learning process, students' evaluation learning was proposed as the best way out. Indeed, evaluation provides important information to university administrators and instructors to estimate the effectiveness of teaching and the quality of the learning taking place. However it is hard when the class size is very large since the existing system is paper-based, a time-consuming, monotonous, less flexible and provides a very hectic working schedule. In this work we examine issues related to the remote evaluation in higher education at University of Oran 1 Ahmed Ben Bella (Algeria), we focused our study on second year students in computer science. The main contributions of this paper is to provide a quick and immediate tool that helps evaluating large numbers of students and that meets the requirements for both teachers and students. This tool is a web based online assessment system; it allows teachers to create tests and answers, reduces paper work to promote students learning by the checking their answers and computing their scores.*

Keywords: *Higher education, innovative teaching practice, e-Assessment, students' evaluation learning, remote evaluation, online assessment system..*

1. Introduction

ICT has proven tools and technologies to meet the requirements of a learner at various phases of learning cycle through the admission phase, the learning phase, the evaluation phase and finally the certification phase as service [3], [1]. One important element of the educational process is the examination. As the number of students in university of Oran 1 Ahmed Ben Bella is increasing from year to year, teachers face their biggest challenge when they give assignments and tests to do to their students since they are adopting the manually conducted examination.

In addition, teachers spend their time preparing for tests and exams while they can do their own academic studies and works in this time. Also, tests have to be gathered and created, and detailed feedback has to be written for each and every individual student. Furthermore, transferring the scores of the exams to an information system or at least to any kind of computer environment is another time consuming on its own.

Besides, all those actions include inaccuracy risks due to the human error factors because these actions are being carried out manually in the present paper-based system [7]. Teachers are currently using web services to upload and share class material, and email

to communicate and inform students about planned tests. However, these tools quickly become constraining as everyone has to manage a great deal of information that was scattered here, there and everywhere. Each year, teachers have to juggle between lists of their students email addresses while students have to filter between lists of all their professors.

Therefore, to resolve this problem, we present in this paper a new web-based tool to change the current manual system into computerized one. This tool would be very useful for our educational institution where the regular evaluation of students is required. On the other hand, it presents several challenges:

- Offering the same capabilities of paper-based test online reduces consumption of goods such as papers.
- Help the teacher to spend less time organizing his students' assignments. So instead of getting lost in email lists, he gets all the assignments organized in a single place.
- Once the test is over, the result will immediately be shown which reduces students' anxiety when waiting for the result.

- Provide students with a correction sample of the test for example in PDF file format which they can immediately print it or save it on their computers.

The rest of the paper is organized as follows: section 2 gives an overview of related works. Section 3 gives the design of the online assessment system. Section 4 describes the implementation and presents some results. Section 5 concludes the paper.

2. Related Works

Distance education implies that the majority of educational communication between teacher and student occurs in non-contiguously way at different times and places separating the instructor-tutor from the learner [5].

The first generation called “Correspondence learning” crossing the end of the 19th and the beginning of the 20th century. In correspondence learning the major means of communication are printed materials, usually customized textbooks contains lessons outlines and exercises. Students complete assignments based on the textbook instructions and mail the assignments to the instructor, who provides feedback via first class mail [4].

The second generation started in the early of the 1970's, with the advent of “Open universities and Tele-learning”. The aim of open universities is reaching off-campus students, delivering instruction through radio, television, recorded audio-tapes and correspondence tutoring.

The early 1980's was the beginning of the third generation called “Interactive distance education” which benefited from computer networks connecting teachers and students. Students learn by reviewing videotapes, audio tapes, textbooks or multimedia CD-ROMs. Bulletin boards made their first appearance for group interaction at a distance, offering central repositories for class communication [4].

In [6], authors describe e-learning as “an innovative approach for delivering instruction to a remote

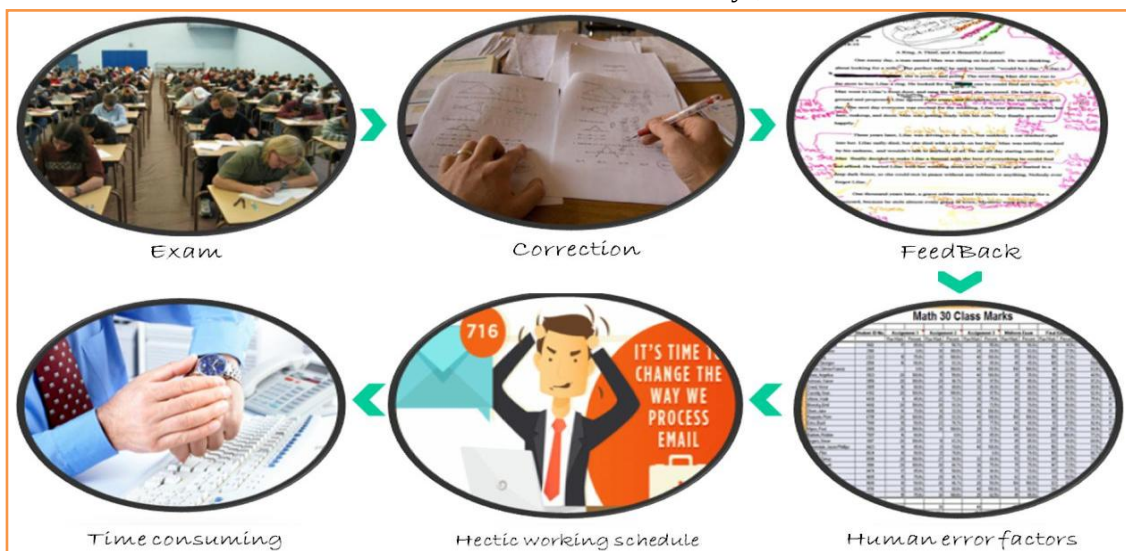
audience, using the Web as the medium”. E-learning has two modes of diffusion: synchronous and asynchronous. Synchronous learning requires the simultaneous participation of all students and instructors online. In other words, interaction is done in real time. Examples of synchronous e-learning are online chat and video conferencing.

Additionally, asynchronous learning can be carried out even when the student or teacher is offline. Coursework and communications delivered via web, email and messages posted on community forums are perfect examples of asynchronous e-learning.

A Massive Open Online Courses (MOOC) is a model for open online content that can be taken by anyone with no fixed dates, no enrolment criteria and no limit on participation. In the MOOC model, frequent quizzes and interactive exercises are used to test understanding. Online assessments can simplify the certification or accreditation process, provided the learner can be authenticated and robust quality assurance processes are in place [2].

Distance education has evolved from correspondence to broadcast radio, to teleconferencing, to mixed multimedia, and currently to Web based or virtual learning, all due to the introduction of information and telecommunications technologies.

Nowadays, ICTs and Internet can allow rich



interactive distance learning experiences that may surpass the interactivity of a traditional classroom. The E-Assessment system can also be used as complement to the students' learning by giving them more homework and quiz revisions to do outside class schedules.

In this work, we use the online test platform as a new innovative teaching practice to conduct an examination through internet or intranet at University of Oran 1 Ahmed Ben Bella (Algeria). Our purpose is

to remove the most disadvantages that were in the formal examination system.

3. E-Assessment –Online assessment system

This section presents the different steps of the conception of our web based assessment system that can handle diverse tasks and needs of teachers and students.

Figure 1. The formal examination system.

3.1. Problem definition

The usual method of exams as illustrated by Figure 1, involves the paperwork, then correcting of the students' copies, consulting the marks and at last reporting the results in computer for printing the reports.

Conventional examination process which is a time consuming procedure has been replaced by online test in the recent times. This modern form of assessment has become widely accepted and used in most of the recognized educational institute because of its needs of less manpower to execute the examination with speediness and precision.

Managing educational institute can easily check the student's performance during the examination. As a result of examination, educational institute's

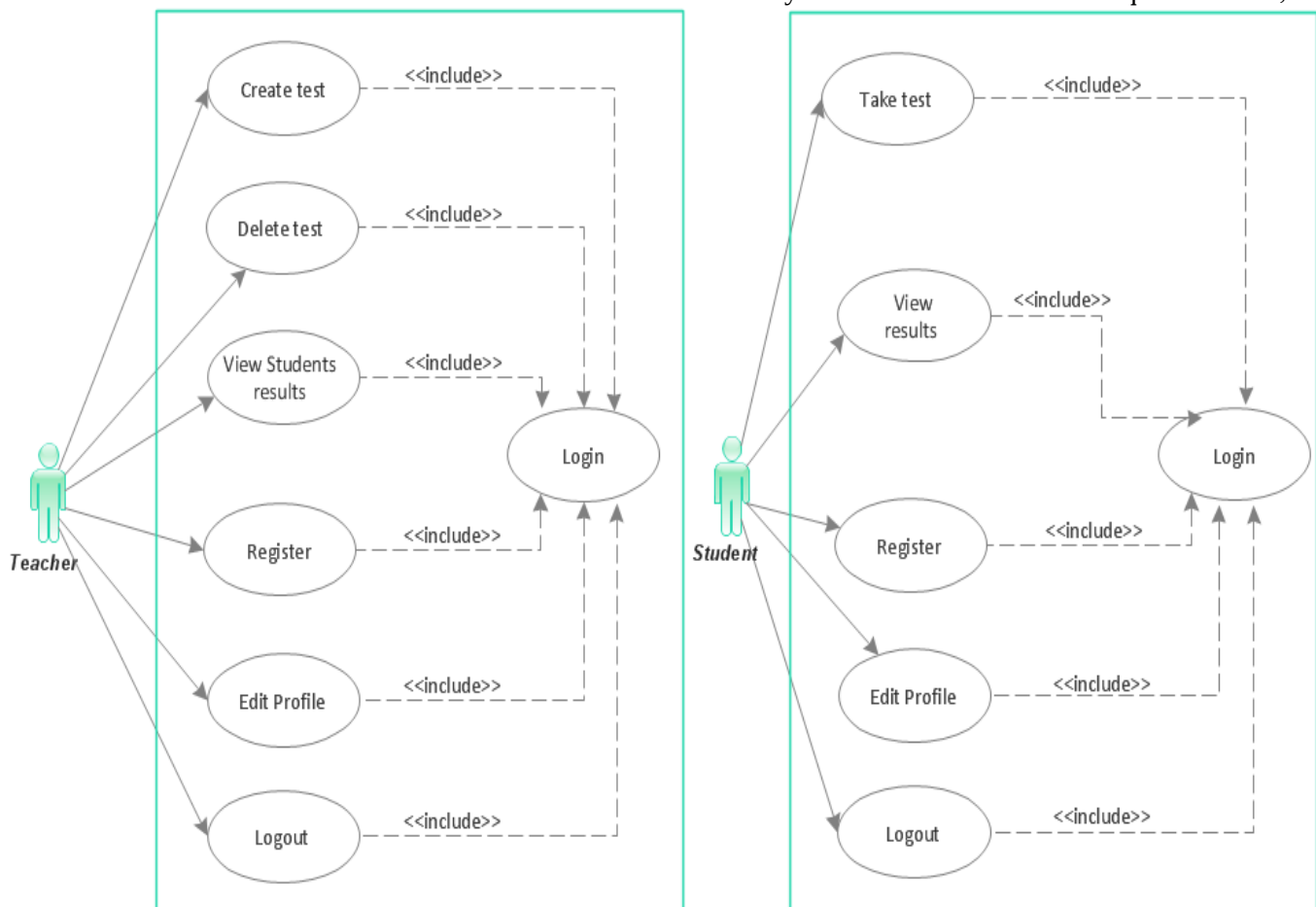
administration is releasing results on time. It helps also saving environment by using digital formats over papers whenever possible.

In addition, the most important advantage of making exams online is the storage of data. Saved in a structured format the data can be used to make reports, charts and presentation over a period of time.

According to the LMD system (Licence-Master-Doctorat in French) applied in Algerian universities, teachers are required to program multiple continuous controls (CC). As the number of students is increasing year by year, teachers should give extra effort when they give tasks and tests to do to their students.

3.2. System design model

For the problems mentioned above, the necessity of a new system of assessment is required. Thus, we



provide a working environment that is flexible, reliable, resource saver and with user friendly interface that thanks to it, teachers can save time and workforce, and students can speedily have responses of the tests and learn their scores. We have called our system of assessment "**Open E-Test**".

Figure 2. presents use case diagram which consists of two actors **Teacher** and **Student**. For registration username, first and last name, email, password, role id should be entered.

The **Teacher** logs in the system if he already has an account. He has the privileged to create, delete, enable, disable test. He can also view his student's results. The Teacher can create a test, specifies its title, duration and date, then he enters questions, answers and mark per question. He also can modify and delete the test and its particular questions.

The **Student** performs actions like register, login, logout, edit profile, take test and view results.

Figure 2. Use case diagram showing the actions of online assessment system "**Open E-Test**".

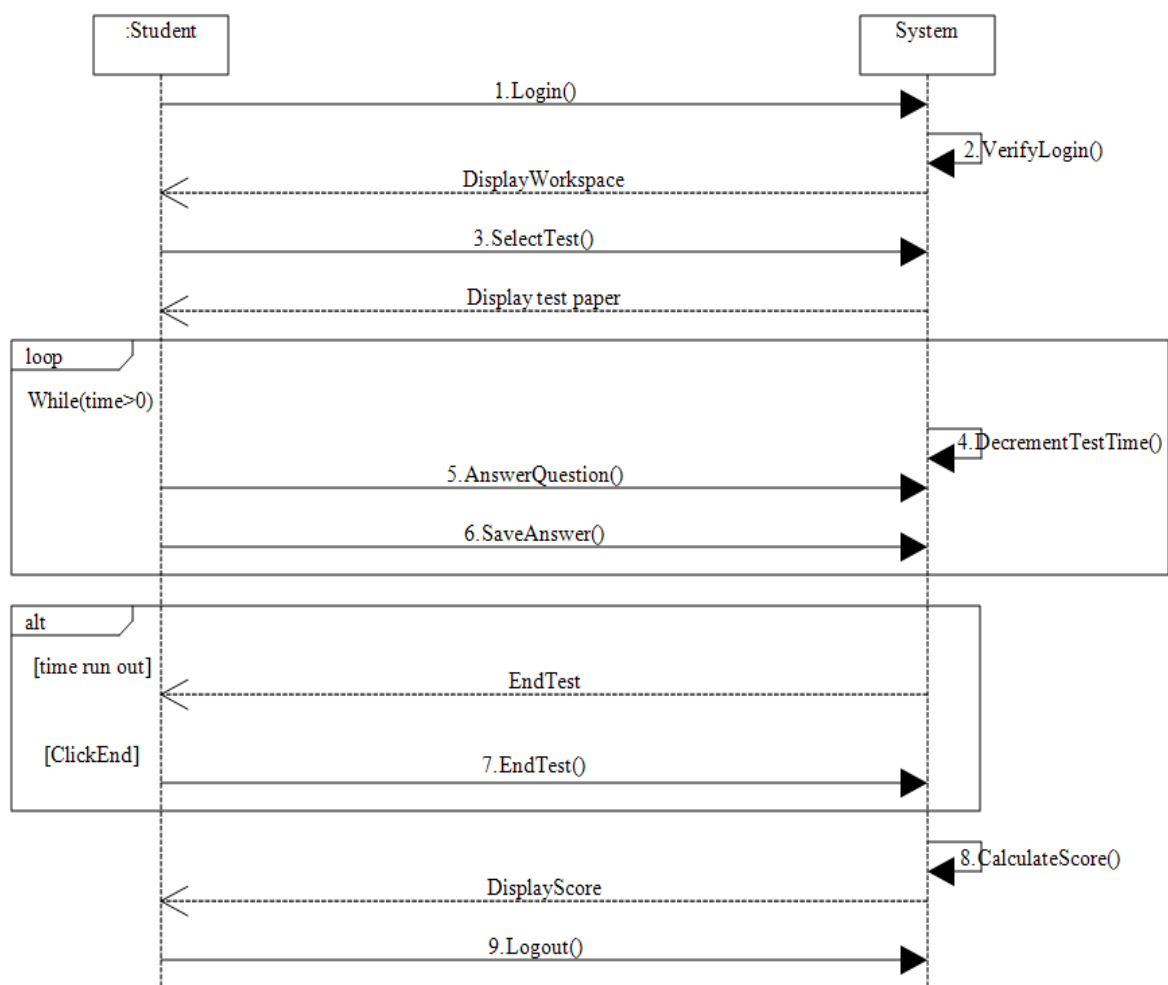


Figure 3. Sequence diagram for test conduction

The diagram of sequence among the System and the Student is shown in Figure 3. This sequence diagram is based on test conduction.

The student logs in the system if he already has an account and takes the test. The Server checks for authentication and allows the student to log in after finding that he is authenticated, the login is mentioned successful.

He can also check his previous tests marks. When the student takes the test, the system automatically add

the marks allocated for each question to determine the total mark immediately after the completion of the test.

The test ends in two cases, first the student clicks to end the test of his own accord before the finishing time, or second test time run out, and in both of cases, in the end of the test student can view his result on the screen immediately then quit the test and logs out the session.

4. Experiment and Results

The online assessment system consists of three independent components: Web browser, online System Server and database server as illustrated by Figure 4. *Open e-Test* will be a web-based for online users.

The system will run over the windows operating system. The platform is made with PHP and Mysql as the database management system. It runs on Apache Server. The web server runs over wampServer and the programming languages used for developing this system are: HTML, CSS, and JavaScript. Others technologies are used to develop this online assessment system:

- Design Layout is made using Bootstrap framework.
- MailDev: is a SMTP server and Web interface for reading and testing emails.
- WKHTMLTOPDF: is an open source command line tools to render HTML into PDF. We used this tool to transform the test paper into PDF format so that the student can download it or print it.

Figure 5. shows the screen related to create test by the teacher who already has an account to directly access his workspace.

The teacher clicks on create test that's shown on his workspace, then he enters test title, duration (Figure 5(1)). After that he adds questions and answers in Figure 5. (2). Test results can be generated

understand their areas of concern; it will also help teachers to create their courses in view of that.

5. Conclusion

Open e-Test system is a web application; this application provides facility to conduct online assessment. Adopting this new tool in our University will save teachers so much time, as it allows number of students to give the test at a time and displays the results as the test gets over, so no need to wait for the result, it is automatically generated by the server. Our system can be used as a supplement to the traditional face-to-face education. The teacher can use it to conduct formative assessment to estimate its student's comprehension inside the classroom.

Our project will continue to provide attention and focus in an attempt to exploit this Internet based assessment and evaluation approach as a way to improve the curricular and pedagogical quality.

The work we have done can be improved and enriched in order to make the system more efficient. The type of questions is only multiple choices, and the system is designed to be used by only the teachers and students of University of Oran 1. Among the perspectives to be considered to improve the functioning of the system, we cite:

- Provide the teacher with other types of questions (true and false, matching, drag and drop, etc.).
- Provide monitoring through webcam, when the student gives the test from home.



Figure 4. *Open e-Test*, technology and tools

instantaneously with analytics graphs, detailed topic wise report, thus exhibiting the key performance area of each student. Statistic reports will help students to



Figure 5. *Open e-Test*, Teacher/Student workspace

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