Abstract—An Electronic Assessment System (EAT) is introduced to improve the teaching process in an E-learning environment. The system provides the instructor with assistance to modify the course contents. Since student is a key element in teaching, EAT takes into account the student answer, answer-time and student feedback as parameters.

In EAT; instructors can generate a test in Multiple Choice Questions (MCQ) form. Also, it gives the instructor an absolute management on database. EAT provides both the student and the instructor with a Web-based forums to retain their feedback. This work provides a case study on the use of EAT in e-learning. The outcome of the case study is analyzed to evaluate the performance of the system.

I. INTRODUCTION

A few years ago, Internet was nothing more than a decentralized network of computers. Recently, Internet seems to be heading towards the networking of all appliances in our life. Internet encourages us to convert almost our needs to electronic needs (E-need), something like E-Book, E-Culture, E-Music, E-Learning, and so on.

E-Learning is one of the most important applications and it has many criteria. E-learning was changed from an instructor-centred to a student-centred model; these models are realisations of the instructionist model and constructivist model respectively [1]. The instructionist model, knowledge and information are transferred from the instructor to the student, while the constructivist model mainly focuses on the learning process, and the aims of assessment in both models are different.

Assessment in the instructionist model (instructor-centered model) was used to tell students about the level of their achievement or grading students, but in the constructivist model (student-centered model), assessment was used to diagnose learning problems to find a way to solve it, and promote further learning [2].

Most organizations offering online learning material, must examine the role of assessment and evaluation in this new learning medium [3]. These assessment-results can enhance the E-learning System. There are two types of assessment: Summative assessment and Formative assessment. Summative assessment is an assessment used for grading and telling students what they have achieved [4]. It can be used to assist the learning process by providing feedback to the student, which can be used to highlight areas for further study and performance improvement [4].

The other type of assessment “formative assessment” is used to promote learning. It is designed to provide the instructor with rich feedback according to the assessment technique. Time and feedback are essential parts of the student-centred assessment.

Both types have been used in this paper to assess the quality of the course and to discover the week points of the course, which may disturb students, so that the instructor can fix them. ETA provides the instructor and the student with valuable feedback.

Feedback can perform several functions depending on the purpose of assessment [5]. ETA combines both the student answer and the student feedback with the student answer-time to give the instructor a complete view about his/her course. ETA can assess the performance of the student to improve his/her self-learning capabilities.

This paper is divided into five sections: section 1 explains the difference between “Assessment for Learning” and “Assessment of Learning”. The Integrated Assessment System (IAS) is introduced in section 2. ETA is explained in section 3. The outcomes of applying the system to a group of students are shown in section 4. The conclusion is introduced in section 5.

II. ASSESSMENT FOR LEARNING VERSUS ASSESSMENT OF LEARNING

In 2004, Hall mentioned “A true education requires far more than prepackaged tests and a box of Number 2 pencils”.

The range of assessment practices in various organizations reflects educational traditions established in the past. These assessment systems may vary according to educational traditions, but they often share the following characteristics: they fail too many learners by the following:

-- Focusing on assessment of learning instead of assessment for learning.
--Being limited in scope.
--Driving the teaching (teaching for assessment)
--Ignoring individual learner differences.

These factors contribute to the failure or the rejection of a range of learners within the current Electronic Education Systems.

Current assessment practices tend to focus on Assessment of learning. These assessments largely fail to address assessment for learning, assessment as a means to measure learner progression and to inform the learners about their progression [6]. In other words, a paradigm shift from assessment of learning towards assessment for learning is required.

This paradigm shift ultimately is aimed at making assessment part of the curriculum (Assessment for Learning), so assessment for learning will be multi-dimensional, formative, teaching for learning, authentic, context embedded, and flexible [6]. See Figure 1.

In the next section, an IAS is introduced. It does not exclude assessment of learning. It aims to combine both formative and summative assessment as two different ways of ‘testing’ learners, whilst giving both learners and teachers insights into the learning processes at work.

III. INTEGRATED ASSESSMENT SYSTEM (IAS)

Integrated Assessment System (IAS) would be beneficial to both students and instructors. So, the implementation of Integrated Assessment System (IAS) would allow instructors to:
1) Spend time focusing on developing the teaching of the curriculum instead of teaching to the test.
2) Spend less time with the preparation and administration of assessment.
3) Get useful information about individual learners’ progress.
4) Furthermore, the implementation of Integrated Assessment Systems (IAS) would allow students to: Test themselves both independently and/or as directed by the instructor.
5) Get information about their individual learning progression.
6) Develop his/her problem solving skills. See Figure 2.

The uses of technology in learning environment lead us to develop an Integrated Assessment System (IAS) to meet the new trends of e-learning and e-assessment [7], so we can use a computer to assess the performance of the learning process, we can summarize this definition in just three words Computer Assisted Assessment (CAA).

Finally, E-assessment will play a major role in developing Integrated Assessment System (IAS) using the following points:
1) Integrate both new and old ways of assessment.
2) Provide new perspectives on test validity.
3) Develop new methods.
4) Integrate formative and summative assessment modes [6].

In this paper, it will be identified key factors of assessment technique that should be taken into account when constructing E-Assessment Tool (EAT).

IV. E-ASSESSMENT TOOL (EAT)

EAT is a web-application for CAA, it is based on the combination of three parameters that are the student answer of each question, the feedback that get from student himself , and the student answer time for each question using a technique (it will be described in details in the next sections).

EAT consist of four mainly sections:
1) Instructor Space.
2) Assessment Preparation.
3) Student Space.
4) Data Analysis.

The architecture EAT is shown in Figure 3. More detailed discussion of the elements of the EAT are given in the next paragraphs.

A. Instructor Space

EAT gives instructors an absolute management on the database. So, they can build their own courses (in pdf or PowerPoint format) and manage the questions database.

The instructor will be logged in the system, he is directed to own a web page that contains a course area, test area, and a report area (so these areas will be described in detail later).