Online/Web-based Student Assessment: A New trend in Evaluation

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Abstract
Evaluation is an integral part of teaching-learning process. Many of the recent advances made in educational measurement and evaluation could be attributed to computers. There is a continuous update in both hardware and software and hence there is an emergence of many newer applications. People have realized that application of these technologies can enhance the quality of learning experience. However, one must admit that the use of computers in evaluation has probably risen due to the enhanced time, money and effort spent. Technology can be used for assessment purposes at multistage, from the management of the assessment information to a fully automated assessment system. In recent times, education world has seen emergence of several areas in computer-based assessment. There has been growing interest and increasing practical experience in the use of computer to deliver objective tests. Objective testing is often taken to imply the use of multiple-choice questions. Many packages are available which are designed for the electronic delivery of objective tests, all of which support the delivery of a variety of question questions. In addition to using electronic packages to create unique tests, it is possible to use the computerized delivery from a bank of questions or of randomly generated problems, supported by automated marking and feedback to the student is flexible and efficient method of providing formative assessment. In recent times the education world has seen the emergence of different efforts at using computers to evaluate the content of essays. It is need for the hour to break the myth that online/web-based evaluation is nothing but objective-type multiple-choice questions and it is also true that virtually all the questions type which exists in conventional testing are capable of being handled through web. Hence this paper throws a light on emergence of new trend in evaluation using online/web-based student assessment.

Key words: Computer, Online/Web-Based Student Assessment, Objective Tests, SUBJECTIVE Tests.

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1 Introduction

If we talk about the testing in a conventional setup, student evaluation means that the student has to write an examination of two-three hours, which will test his level at a given point of time. These tests measure the knowledge and skills considered important in the learning. However, the goal of these evaluations is to just ascertain that at the time of taking the examination the student should be able to exhibit his performance on the concepts asked in the question paper. There is an immense importance of achieving intended learning outcomes. However, these kinds of evaluations are restricted to student achieving marks or grades that are as per the pre-defined pass level. These evaluations are, in their entirety, summative in nature. But what is happening today is, rather than using testing as a learning tool, students also become interested in getting taught for the test material itself. To be significant, the act of evaluation must enhance the learning process and thus comes the concept of continues evaluation component, which is formative evaluation, intended to provide feedback to students errors, they have committed in understanding the concepts. At this juncture, we need to think about the teachers who are using or planning to use computers in their classrooms for enhancing the quality of the learning of their learners and also finding it difficult to manage the load of growing numbers. Already Computers have received their due importance in instructional activities, but it is also true that there is a lot of scope for developing its role in assessment and feedback. This is the main reason of our interest in online / web-based assessments which on the one hand, performs both summative and formative functions of evaluation and on the other hand removes the biases which are prevalent in human evaluation.

2 Computers in Student Evaluation

Computer plays a vital role in every sphere of life including in the field of education. It is always assumed that computer can be better used for instructional purposes in the classroom situation, but now the time as emerged so that it can be used to assess students with the help of online and web-based student assessment. There are immense benefits of using online and web-based evaluation. The first and foremost benefit is in the increased frequency of evaluation that performs both formative and summative functions. Putting quizzes and assignments on web and enabling the student to do a sort of self-assessment and feedback can be offered to a single or a group of students as the requirement is. It can also aid in summative function as it can be utilized for other meaningful activities. The teachers can declare the results with a click of a button, which will eventually aid the students in their planning if further studies.

3 Online/Web-based Evaluation: Electric Delivery of Objective Tests

The prevalent evaluation system, in most of the institutions, has two components i.e. the continuous assessment component carrying a weight of 30% and a term-end component carrying a weight of 70%. The former component is further broken into two components based on the nature of the assignments i.e. Computer-Marked Assignment (CMA) and Tutor-Marked Assignment (TMA). Computer marked assignments are generally multiple-choice questions (MCQ). However, objective type tests can have a lot of other formats like fill in the blanks, word entry or number entry, identifying a segment etc.

Several packages are developed and are available for electronic delivery of objective tests. These
packages offer a huge variety of questions format. These packages are capable of giving feedback and doing assessment as well. The important packages which deals with Objective tests can be enumerated as

1. CAPES
2. Examine
3. Questionmark Perception

a) CAPES: It is called Computer Aided Paperless Examination System. This is system was based on optical memory technology, especially CD-ROM where large amount of data pertaining to optimally designed questions banks and answers can be stored. The system then with the use of computer network allows conduct of examination with minimum requirement of manpower for supervision and maintaining security of the examination.

b) Examine: It is a multiple choice delivery system for Windows, It can be used both as teaching and assessment for teachers and also helps the learners to self-assessment and revision.

This consist of two components
- Examine is the delivery Engine proposed for student use.
- Quiz Maker is a tutor tool that enables teachers to generate teachers from the available questions.

c) Questionmark Perception: It is the software that helps the teachers to write, administer and report on assessment, quizzes and surveys using Computers. Perception for web is a package for conducting assessment for using the internet and entrants. Questionmark is a authoring system with many question types having a good feature that enable one to deliver the assessment in an offline mode but still capable of storing the answer. It has integrated sound and video with questions and answers so that it enhances the effect of assessment and overall learning.

4 Possibilities in Subjective tests

Technology has made possible to think beyond objective test. Restriction is included only right/wrong kind questions in online evaluation systems are no more in place. However the Objective packages will take answer input as a word or a numeral. Now think that is there any possibilities of computer conducting subjective test and grading an essay?. Yes, it is possible, a beginning has been made in this direction and time is not far where we will be equipped with customized software to evaluate students in your very specific course through the computers. The constraints are none but one: The student has to key his own answer in the computer. As a teacher we have to feed information into the computer from the textbooks and other sources. The computer in turn forms relationships between the words. As a teacher we are expected to give computer a set of model answers that are graded by the human evaluators, which would eventually provide the computer a basis for comparison. It is not as simple as it looks but then once you are through you would be able to evaluate thousands of essays with the click of a button. The software also provides feedback on what the student left out in the answer besides giving a grade to the answer.

In recent times the education world has seen the emergence of two efforts at using computers to evaluate the content of essays. These are:
• Intelligent Essay Assessor (IEA)
• Graduate Management Admission Test (GMAT), which employs system called E-Rater.

4.1 Intelligent Essay Assessor (IEA)
It is based on the statistical approach for analyzing essays and content information. This statistical approach is called Latent Semantic Analysis, which is used primarily to extract semantic content of the text. It is also proved that Latent Semantic Analysis captures the similarity of meanings expressed. This technique is successful in giving judgments very close to the human judgments. Here the semantic focuses on the conceptual content of the essay, i.e., on the correctness and completeness of the content, the soundness of the argument and the fluency and comprehensibility of the writing.

4.2 E-rater
It is the software in the computerized evaluator segment. Educational testing service uses it for the Graduate Management Admission Test for testing the analytical writing assessments. E-rater is used as the second rater replacing the second human rater and thus reducing large costs on evaluation. It checks the essay for the argument structure, syntactic structure and vocabulary structure. Software is based on three general classes of features: Syntactic, Rhetorical and topical content features. The features are extracted from the essay texts and qualified using computational linguistics techniques.

5 Methodologies of Essay Evaluators
5.1 Latent Semantic Analysis
It is a statistical model of word usage that permits comparison of the semantic similarity between pieces of textual information. It assumes that there is a Latent or concealed structure in the pattern of word usage in the essays and statistical can be used to eliminate this masked thing. The method generates the depiction of words that are used in similar contexts and are more semantically associated. It generates a matrix of occurrence of each work in each essay and then decomposes these matrices into a set of hundreds of factors. Since the number of factors will be much smaller than the unique words, words will not be independent. If two terms are used in same context they will have similar factors. Matching is then done between two pieces of textual information even if they have no words in common.

5.2 Syntactic Structure Analysis
Syntactic variety is an important feature in evaluating essays. It defines the ratio and quantity of types of sentences, types of clauses and use of verbs. This analysis parses through each sentence in the essay and quantifies these features. This parsing is done on the basis of Microsoft’s Natural Language Processing tool.

5.3 Rhetorical Structure Analysis
If an examinee is able to demonstrate that the essay he developed, organized the ideas logically and has connected them well, then he ought to get a good score. This analysis quantifies the evidence of organization of the essay. It quantifies the cue words and other structures of the essay. Examples of cue words that are used to define a relation are given by the developers are: In summary, In conclusion, etc.

5.4 Topical Content Analysis
A good essay resembles other good essays in its use of vocabulary use in patterns. This analysis evaluates the topical content of an essay by comparing it with the other model essays that are graded by the human evaluators. It uses two different measures of content similarity. First, one is based on the vocabulary use in the essay as a whole and other is based on specific vocabulary content of the argument found in the essay.

6 Implications for education

The computerized essay evaluators have the following implications for education:

a) Reliability Regulators: Many teachers grade an essay and then use computerized essay evaluators to ascertain the correlation. Only computer can offer unbiasedness, consistency and robustness.

b) Mass Evaluation Tool: Computerized essay evaluators can be used for a large number of examinees with a less cost and time under the identical evaluation yardsticks.

c) Friendly On-Demand Tutor: Computerized essay evaluators can work as a friend, philosopher and guide to the students by offering comments and their work and thus improving the quality of their writing. This can be of great help in distance education where the student is fairly distant from the teacher.

d) Pre-Testing Tool: Computerized essay evaluators can work as a great tool for the students to know beforehand about their preparations for the final term-end exam. Students can write and review their essays at the end of each chapter and then assess the areas on which they have to work more.

e) Second Rater: Computerized essay evaluators can work as a second rater to cross check the major differences, if any, with the human evaluators. This is especially useful in the high stake assessments such as in GMAT.

In short, computerized essay evaluator presents a good tool for assessing the quality of the essay in question. These can be applied in the classroom for deriving respective benefits. The need at the moment is to generate the artificial intelligence in varied subjects.

7 Conclusion

We are still in the infancy stage when we talk of online/Web-based student assessment. The progress in imparting on-line learning is phenomenal, but on the online assessment front a lot is still to be done. But the good thing is that tools are available and are in abundance. The need is to change in the attitude. Though assessment created for online/web-based assessment do require a lot of time when established for the first time, but in the long run proves beneficial by reducing the time, cost and efforts. They enable generation of a true feedback to the student instantaneously. Web-based assessment eliminates the with-in and between biases of the human evaluators and thus provides consistency and reliability which is impossible for a human valuator. It can help in automatically recording the results as and when an assessment is completed. Online/Web-based student assessment on one hand enhances the learning opportunities for the students and on other hand provides tools for the teacher to do much more rather than wasting time on redundant assessment.
References


