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Computer-based assessment: pros and cons

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ABSTRACT
Technology today offers many new opportunities for innovation in educational assessment through rich new assessment tasks and potentially powerful scoring, reporting and real-time feedback mechanisms (Scalise, K. & Gifford, B. 2006). This paper elaborates on the pros and cons of computer-based assessment. The intended purpose is to provide a new assessment horizon for assessment developers and teachers and to help them to get a better understanding of using computer-based assessments in the educational settings.

Introduction

Advances in computer technology continue to change the lives of instructors and students. One of the exciting new ways to use computers in education is in testing. According to Brown (1997), computer-based tests (CBTs) have been used in second language testing since the early 80's. This rapid change in mode of administration of tests is very understandable. As Jamieson (2005) states, computers have a number of very desirable functions that considerably eases up the test creation and assessment task, including item creation and presentation, answer collection and scoring, statistical analysis, and storage, transmission, and retrieval of information. Also the literature on computer-assisted language learning indicates that language learners have generally positive attitudes towards using computers in the classroom (Reid, 1986; Neu and Scarcella, 1991; Phinney, 1991).

Computer-based assessment has been used in many disciplines to give both formative feedback and to offer summative testing. This is especially so in the sciences. There is evidence to suggest that formative computer-based assessment can produce improvement in student learning outcomes (Clariana, 1993) and that this can lead to a positive attitudes of students to learning.

Computer-Assisted Language Testing

Tests that are administered at computer terminals, or on personal computers, are called computer-assisted tests. Receptive-response item – including multiple-choice, true-false, and matching items- are fairly easy to adapt to the computer-assisted testing medium. Relatively cheap authoring software like "Testmaster" (1988) can be used to create such tests. Even productive-response item type- including fill-in and close- can be created using authoring software like Testmaker. Nowadays, with advances in computer and technology, even the more interesting types of language tasks (e.g. compositions, oral presentations, interviews) can be done by computers.

In fact, the types of questions asked via traditional paper-based assessments and exams can also be asked via a computer-assisted assessment or exam. However, computer-based assessment questions can incorporate multimedia elements such as images, video, and sound to make the testing experience more robust than a paper counterpart (Weeden in Morgan and Spector, 2004).

Weeden (2004) lists five methods of collecting students answer in a computer-assisted assessment:

1. Selecting (multiple-choices); where students select from a list of choices.
2. Supplying; where students type in short answers and responses.
3. Ordering/ranking; where students order to rank a list of items in a correct or preferred sequence.
4. Matching; where students identify linkages between two lists of items.
5. Locating; where students identify something from a larger form. For example, given a picture of a house, click on the roof.

The listed assessment methods are methods used in paper-based assessment but with computer-assisted assessment video, audio, and images can be used alongside the assessment forms.

Why do we need to create computer-assisted language tests? First, computer-assisted language tests can be individually administered even on a walk-in basis, thus group-administered test will no longer be necessary. Second, traditional time limits are not necessary. Students can be given as much time as they need to finish a test because no human proctor needs to wait around for them to finish the test.

Computer-based test also can be supervised or non-supervised, and can be used for diagnostic, formative or summative assessment. This can take place locally or at a distance, using intranets or the Internet. But there are both advantages and disadvantages with using on-line or computer-based assessment.

Administrative advantages

1. Computerized marking is not prone to human error.
2. Saves staff time in terms of supervising and marking (including double marking) assessments.
3. Reduction of printing costs, particularly when tests are updated or changed

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Administrative disadvantages

1. Implementing a CBT can be costly and time-consuming)especially when trying to integrate with an institution's MLE).
2. Staffs who design and invigilate CBT need training in assessment principles and design, IT skills and examination management.
3. A high level of collaboration between all those involved in designing and implementing CBT required.
4. Some systems cannot implement anonymous marking.
5. Hardware and software used to deliver CBT needs to be robust in order to avoid failure at crucial times such as examinations.

Pedagogical advantages

1. Tutors can incorporate hints into test questions.
2. Tutors can monitor the progress of students through frequent use of assessment.
3. Students can monitor their own progress and revise and rehearse at their own pace.
4. Detailed and specific feedback can be given to students during and immediately after a test.
5. Tutors can assign different learning activities to students based on their test results.
6. Can provide tutors with feedback for evaluation of modules/courses/programs.

Pedagogical disadvantages

1. Unsupervised CBT sessions present a risk of plagiarism (it can be difficult to authenticate the identity of students).
2. Students need to have sufficient IT skills and experience of the requirement of CBT.
3. Staffs have a tendency to just use MCQs which can be tedious and demotivating for students, and it has been argued that MCQ focus on testing superficial levels of students learning.

Other advantages

1. Timely feedback; the teacher can provide feedback.
2. Automatic feedback; some forms of on-line assessment answers (i.e. multiple choices).
3. Monitoring and tracking of learners' results behavior.
4. Choice of assessment modes, such as multimedia, interactivity, etc.
5. Time-saving; an assessment can be created using software tools and adapted and reused as needed. They can be distributed and collected using a web-based system which saves development and distribution.
6. Reduces resources needed by replacing human resources with computer resources.
7. Reduces turnaround time; as the systems enables assessments to be corrected by computers. Reduced time further enables students to use the knowledge obtained from corrected assessment to address further assessment sooner.
8. Keeping records of results that can be stored centrally and assessed by interested parties, such as students and staff.
9. Increasing ease with which data can be used as corrected assignment corrected and stored electronically can be analyzed easier and the data can be used in spreadsheets and other statistical packages.
10. Flexible and comfortable environment; on-line tests afford students the opportunity to take tests on their own terms.
11. Time-consuming grading can be done by assessment software.
12. Once taken and graded can be reconfigured for multiple attempts, providing practice tool for students.
13. Computers are more accurate at scoring selected-response tests than human beings are.
14. Computers are more accurate at reporting.
15. Computers can give immediate feedback.
16. Diagnostic feedback can be provided very quickly to each students on those items answered incorrectly if that is the purpose of the test.

Other disadvantages

1. A high level of organization is required across all parties involved in assessment (academics, support, staff, computer services and administrators).
2. Assessors and invigilators need training in assessment design, IT skills and examination management.
3. Hardware and software must be carefully monitored to avoid failure during examination, and students require adequate IT skills and experiences of the assessment type.
4. Construction of good objective tests requires skills and practice and so is initially time consuming and because of this, testing of higher other skills is difficult.
5. Computer anxiety
6. Differences in the degree to which students are familiar with using computers.
7. Technical malfunctions; computer equipment may not always be available or in working order.
8. Cheating will arise.
9. Absence of instructor; instructor is not on-demand when has a question about a problem or when a student may be confused by the language of the problem.

Conclusion

Despites all disadvantages, I see computer-based tests as being very effective since they can be replaced instead of "chalk and talk" lecture- once described as ' the transfer of information from the notebook of the lecturer to the notebooks of the students without going through the minds of either'. Many of the facts which have to be learned can be delivered informatively and interestingly by CBT. The retention of the material can be tested by the same programs. This releases instructor time for tasks at which he/she is more effective: debriefing, reviewing, discussing, and directing. Computer-based assessment also can provide an environment for practice, at the student's own pace and in his/her own time. And it can provide an environment for assessment, including self-assessment.

Learning theory has long established that students learn more effectively if they are actively involved in the learning process (i.e. interaction), are given feedback on their progress and have the opportunity to repeat and practice (i.e. reinforcement). Therefore, I think coputer-based assessment can provide a very good learning and assessing environment.

Educational implications

According to Smith and Broom (2003), students and teachers alike still lack basic information technology knowledge and skills. In addition, the current curriculum, instruction, and assessments do not adequately make use of the capabilities of today’s networked information systems (Smith & Broom). Peat and Franklin (2002) believe that the use of on-line computer-based assessment, both formative and summative, has led to significant benefits for staff and students. Staff have more time to interact face-to-face with students and students have opportunities to gain extensive, immediate, quality feedback at a time to suit them.

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