

WebMC: A Web-based Multiple Choice Assessment System

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Development of WebMC

This paper describes the development and evaluation of WebMC, a web-based multiple choice assessment. By using the web as the basis of this system, no paper resources are required, and students may use WebMC from any location with access to the Internet, such as classrooms, libraries, home and work. By using the advantages of web-based computer programming, the system is interactive (using cgi scripts) and platform-independent (i.e. it will run on any computer with web access regardless of operating system, such as PC, Macs and Unix-based systems). These advantages of the web have already been utilised for “Web-based tutorials” (Gazzard & Dalziel, 1997), but can also be used in assessment. The system was designed in such a way that students received immediate feedback on whether they answered each question correctly or incorrectly, and information regarding why each question option was correct or incorrect. Further, at the end of each initial feedback screen, a “more information” link was provided, which allowed students to go to a further feedback screen which presented a general discussion of the question and the topic area to which the question was related. Students would then proceed to the next question from either of these feedback screens. Figure 1 illustrates the structure of the formative assessment system. The version of WebMC evaluated in this paper can be viewed at <http://www.psych.usyd.edu.au/mcweb/>.

WebMC - Formative Assessment

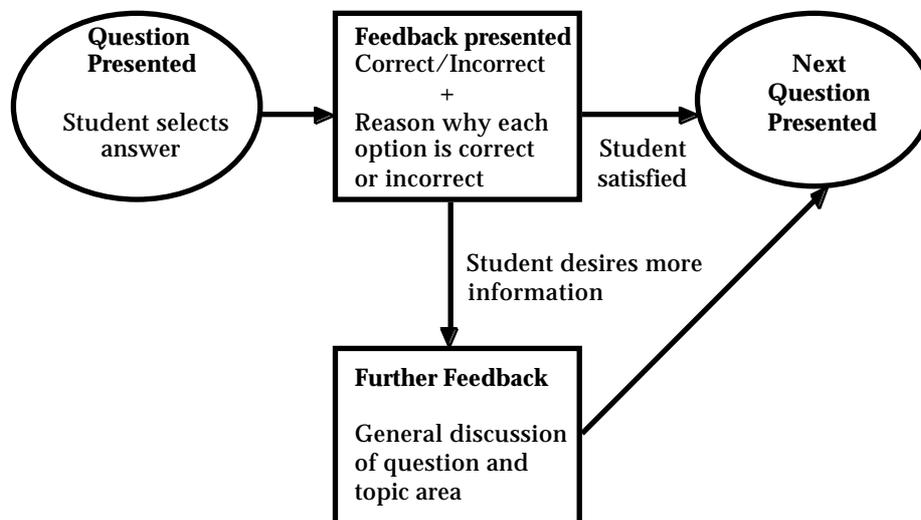


Figure 1. Structure of question and feedback system used in WebMC

The first practical application of WebMC was with a large (1200+ students) First Year Psychology course at the University of Sydney. Tutorial material for this course was previously assessed by an end of semester summative multiple choice quiz. In 1997, WebMC was provided as an additional learning tool in the weeks prior to the quiz, and sets of questions and feedback for each topic area were developed and made available to students via WebMC so as to allow an opportunity for formative assessment prior to the summative quiz. Tutorial rooms (which contained web-connected computers) were left open all week prior to the quiz (there were no classes in this week), with a tutor available to assist with any problems. All students were invited to use WebMC, and were informed that a few of the practice questions could be used in the quiz.



Evaluation of WebMC

The response to WebMC was exceptional. Over 10,000 hits were recorded on the main WebMC page during the month that it was available, and over 1000 First Year Psychology students accessed WebMC at least once (students logged in with their student IDs, so multiple uses were only counted as one student). The tutorial rooms were full for much of the week, and external access to WebMC occurred at all hours of the day (including the early hours of the morning). The general response of students appeared very positive.

On a general evaluation question asking students to rate WebMC as a learning resource (on a seven point scale), 61% of students rated WebMC as “(1) Excellent”, 28% rated it as “(2) Very Good”, 9% rated it as “(3) Good” and 2% rated it as “(4) Average”. No negative responses (5, 6 or 7) were received. In open questions designed to allow students to state what they found best and worst about WebMC, and what they would change, students provided a wealth of comments about the project, the majority of which were very positive. In terms of the best aspect of WebMC, the most popular responses were related to “explanation of wrong answers” and “immediate feedback on answers”. Other positive comments included:

- “Very informative and thorough”
- “Great having it on the Internet”
- “It emphasises your strengths and weaknesses”
- “Easy to use, a fantastic learning tool”

Many students also indicated that using WebMC had encouraged them to go back to their class notes and do further study, such as:

- “It motivated me to study, since I knew less than I thought I did”

The following three longer quotes provide further general information about how students viewed WebMC:

- “It gave me a chance to get a perspective on what to study, as well as being an opportunity to test my knowledge”
- “It was comprehensive, and very helpful having the ‘more information’ option and the summaries”
- “The ‘more information’ section [was best], as it helps students to remember the tutorial, and to put questions in context, giving students the opportunity to take notes”

Many students left the “worst” and “change” questions blank, or indicated that they thought that WebMC was performing well. Several suggestions for change were received. These included: a suggestion that a timer would be helpful; comments that feedback in different sections was not always in the same format; and a request that the text be made smaller so that the entire question would fit on one screen (rather than requiring scrolling down on web browsers with large text formats). All of these suggested changes have since been incorporated.

Finally, many students offered spontaneous praise for the layout, design, structure and even just the provision of WebMC, indicating that they appreciated the system. Quotes such as “THANKYOU! Overall it was great!” were common last comments on the survey. Several students noted that they wished that other courses offered the kind of question and feedback system provided by WebMC.

Conclusion

The design and construction of WebMC was based on sound principles of assessment practice and utilised the inherent potential advantages of the web. Student evaluation of WebMC indicated that it

made a valuable contribution to their learning, and that many students made use of this resource in the context described. Current work on WebMC is developing the system for general use in any course, and additional software is being designed to allow academics with no background in web-design or programming, but just simple word processing skills, to build their own question and feedback sets for courses they teach, and for these to be directly incorporated into a permanent WebMC server. A summative assessment system based on WebMC is currently being finalised.

Reference

Gazzard, S. & Dalziel, J. R. (1997). *How it looks from their side of the screen: Evaluation of a Web-based tutorial at the Department of Psychology at the University of Sydney*. Paper presented to the 97 ASCILITE Conference in Perth, Australia, December, 1997.

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