
Mathematics in WebCT V

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Introduction

This is the fifth paper in a series. Unlike the previous papers [1 – 4], the focus here is narrow. This note is directed to users of WebCT Campus Edition who also use the third party quiz authoring tool, Respondus [5]. What we discuss here is possible because WebCT Campus Edition incorporates WebEQ technology from Design Science [6]. This is also true of recent versions of Blackboard.

Prerequisites – Preferences

Server

- WebCT 4.0 Campus Edition
- Content Migration Utility 2.0.

Designer Client

- Windows 2000 or Windows XP.
- Internet Explorer 6.0 SP1 and the Microsoft Java Virtual Machine (JVM), or
- Netscape 7.02 and the Sun JVM contained in the Java 2 Runtime Environment (j2re1.4.1_02) [7].
- WebEQ Viewer Control, called the WebEQ Equation Editor plug-in in WebCT Help [8].
- Respondus 2.0 [5].
- MathType 5.1 [9].

Student Client

- Windows 2000 or Windows XP.
- Internet Explorer 6.0 SP1 and the Microsoft Java Virtual Machine (JVM), or
- Netscape 7.02 and the Sun JVM contained in the Java 2 Runtime Environment (j2re1.4.1_02) [7].
- WebEQ Viewer Control [8].

It is only necessary to have one of these browsers loaded. Since the Respondus Preview is based on Internet Explorer, designers will find the most consistent results are obtained by using Internet Explorer.

To enable the Sun JVM on Windows 2000 or XP, go to the Control Panel, double click Java Plug-in, select the browser tab, and check the Netscape 6 checkbox.

To configure Respondus for MathML, select Preferences under the File menu, select the “Edit & Publish” tab, and check the “MathML ‘applet’ for all equations” checkbox. Also, select the “Preview using WebCT 4.x fonts” checkbox.

Respondus Projects

We assume that the master copy of each quiz and each survey will be maintained as a Respondus project and that all editing will be done in Respondus. We also assume that the published questions will contain equations encoded using MathML, embedded using applet tags, and rendered by the WebEQ Viewer Control. MathML is verbose but since editing is not being done on the WebCT server, this is not an issue.

The applet tags contain height, width, and align attributes, which are used by the browser to position the equation. Internet Explorer places equations just above the baseline, while Netscape places them slightly higher. This vertical misalignment is barely noticeable in Internet Explorer but obvious in Netscape. There is no adjustment available to correct this vertical misalignment.

Respondus does provide an adjustment for the spacing following an equation. When a question is previewed, the need for a spacing adjustment is clear. Place the cursor on the equation tag, select the Σ on the toolbar, select the “adjust spacing following an equation” radio button, highlight the equation whose spacing is to be adjusted, click OK, and fill in the “WebEQ / MathML Width Adjustment (pixels, approx. 90/inch)” textbox. A negative integer will decrease the spacing and a positive integer will increase the spacing.

Using the “MathML ‘applet’ for all equations” preference provides several advantages. Equations can be inserted in questions, answers, and feedback. The full power of MathType 5.1 is available for authoring equations. A separate image file for each equation is

not required. The spacing following an equation is consistent between Respondus Preview and WebCT.

One disadvantage of the “MathML ‘applet’ for all equations” setting is that equations entered into the pre-fill answerbox of a paragraph question cannot be edited by students. To enable student editing, under the File menu select Preferences, select the “Edit & Publish” tab, and check the “WebEQ equations where supported, MathML ‘applet’ for others” checkbox. With this setting the spacing following an equation is not consistent between Respondus Preview and WebCT.

Note that the four “Publish equations using” preferences only affect the upload format. The preference can be changed and previously uploaded questions or quizzes can be overwritten to test a different preference.

Content Migration

Consider the following migration scenarios assuming all parties are using the setup above.

Sharing a WebCT quiz: A Respondus project archive file can be shared. The collection of all quizzes in a WebCT course can be exported using WebCT 4.0 Campus Edition with the Content Migration Utility 2.0 installed. The resulting zipfile can be uploaded into another similarly configured server, and then imported.

Moving a WebCT Quiz to Blackboard: Open Respondus and change the personality from WebCT 3.x-4.x to Blackboard 5.x or 6.x. Open the quiz. Notification will be given concerning those quiz elements that will not migrate. Publish the quiz to a Blackboard server.

Moving a Blackboard Quiz to WebCT: Open Respondus and change the personality from Blackboard 5.x or 6.x to WebCT 3.x-4.x. Open the quiz. Notification will be given concerning those quiz elements that will not migrate. Publish the quiz to a WebCT server.

Conclusion

The WebEQ technology built into WebCT and Blackboard currently provides the best method for adding equations to quizzes. The applet tags embedded in HTML files are rendered by the WebEQ Viewer Control. Eventually, the Web will move from HTML to XHTML and Internet Explorer and Netscape will deal directly with MathML without the need for applet

tags or the WebEQ Viewer Control. This native treatment of MathML will lead to better vertical and horizontal placement of equations. See [4] for more details.

References

- [1] Mathematics in WebCT, Clemson University, June 1999, [on-line], http://www.math.clemson.edu/~bmooss/math_on_web/math.htm
- [2] Mathematics in WebCT II, Clemson University, June 2000, [on-line], http://www.math.clemson.edu/~bmooss/math_on_web/math2C.htm
- [3] Mathematics in WebCT III, Clemson University, June 2001, [on-line], http://www.math.clemson.edu/~bmooss/math_on_web/math3.htm
- [4] Mathematics in WebCT IV, Clemson University, June 2001, [on-line], http://www.math.clemson.edu/~bmooss/math_on_web/math4.htm
- [5] Respondus, <http://www.respondus.com>
- [6] Design Science, <http://www.dessci.com>
- [7] <http://java.sun.com/j2se/1.4.1/download.html>
- [8] <http://www.dessci.com/en/products>. Select Download WebEQ. The Viewer Control will load automatically into Windows. Load it manually for Netscape. Download WebEQApplet.jar into the directory
C:\Program Files\Java\j2re1.4.1_02\lib\ext.
- [9] <http://www.dessci.com/en/products>. Select Download MathType.