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Article abstract

A common feature of online collaborative methodologies is the whiteboard, a tabula rasa type area in which participants can share simultaneous applications and learning experiences. The current report is the first in this series to examine a range of whiteboard technologies specifically. Some are available in stand-alone freeware products such as Groupboard, while others are components of license-based packages such as VClass and WebCT. The whiteboard features of these three products are reviewed.

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Technical Evaluation Report

20. Whiteboard Products

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Abstract

A common feature of online collaborative methodologies is the whiteboard, a *tabula rasa* type area in which participants can share simultaneous applications and learning experiences. The current report is the first in this series to examine a range of whiteboard technologies specifically. Some are available in stand-alone freeware products such as *Groupboard*, while others are components of license-based packages such as *VClass* and *WebCT*. The whiteboard features of these three products are reviewed.

The Whiteboard

The term 'whiteboard' is used to describe both digital whiteboards designed for classroom use, and virtual whiteboard drawing software designed for Web use. In this report, the term whiteboard refers to a virtual whiteboard used to provide an interactive visual palate for use over the Web. Five qualities of whiteboard required for effective online tutoring can be identified:

1. Adequate compression rates and high resolution to ensure image quality
2. A large whiteboard area for effective implementation of instructional methods
3. Availability of simultaneous whiteboards and an easy method to move between them
4. Unlimited storage capacity to access and save whiteboard tutorials and images
5. Efficient location of user controls for easy access to the whiteboard, especially when the board is larger than the screen

The following reviews compare the efficiency with which three contrasting whiteboard provides such features. The reviews apply the evaluation criteria discussed in Report #7 in this series: i.e., cost; complexity; clarity; and common technical framework.

Product Trials

1. ***Groupboard*** allows users access to whiteboard, text-chat, message board, and game products. It includes a free version, full versions for up to 15 users and 100 users, and a stand-alone server version. This evaluation focuses on the whiteboard component of the free version, which utilizes Java applets hosted on the *Groupboard* server, to support five simultaneous participants. Users are provided with HTML code for inserting their personal webpages. The whiteboard is easy to use, and provides basic drawing tools, text tools, and freehand scripting. A limited number of background files and images can be uploaded, and the whiteboards archived for continued use. The layout and control features are easy to navigate, and the browser window can be minimized to occupy approximately one quarter of a 17" monitor at 1024 x 768 resolution, allowing for other applications to be viewed simultaneously. The whiteboard is relatively stable, with perceptible delays depending on user bandwidth and the amount of traffic on the *Groupboard* server. Compression rates are adequate, though distortions and illegibility can occur when many users attempt to write on the whiteboard simultaneously. The freeware's whiteboard space cannot be customized, and its banner advertising can be distracting. *Groupboard* support is available via an online helpdesk, an administrator's manual explaining the moderator functions and tagging commands, and a user's manual.

Moderators can restrict access to *Groupboard* via administrative and participant passwords; display a log of users at a given time; bar certain users based on IP addresses or names; disable features such as clear, load, and draw, delete saved images; and upload background images. Moderators can also alter the HTML and Javascript functions, though in the freeware version they cannot run simultaneous conferences. Users can host their own *Groupboard* websites using the freeware version, with the applets hosted on the *Groupboard* server, and can save whiteboard data to the server for later use, although not to their own hard drives. Users are prevented from restricting other participants' access. Although the software is interoperable on both PC and Mac platforms, connectivity difficulties were experienced in our tests between the *MacIntosh G4* (OS 9) and a *Pentium III* (*Win/ XP Pro*, running Microsoft's Internet Information Services Web server software).

2. ***vClass*** (an *Elluminate* product: see Report #19 in this series) provides a password-protected learning environment that provides the moderator with extensive control in the set up of the group, as well as the facilitation of online sessions. It does not have a free version, and levies charges depending on the number of concurrent learners. Initial fee for each learner is US $100, with a yearly US $18 fee for maintenance and upgrades. If an organization has four classes each containing 35 learners, it must purchase 35 learner slots, as long as the classes are scheduled at different times. The *Vclass* whiteboard includes draw and application sharing functions, and is easy to navigate by both learners and instructors, even when there are many simultaneous participants. *PowerPoint* and other pre-loaded images do not distort while images are being manipulated. The learner and instructor screens contain easily identifiable icons to guide users; and displays can be customised with their individual windows enlarged or hidden from view.

The *vClass* moderator's control features are modelled on those of the face-to-face classroom. Teachers can enable and disable privileges on a participant-by-participant basis throughout a session; delegate certain moderator privileges to participants; record and pre-record sessions for later access; and block participant interactions so as to prevent distracting or unproductive activity; and ensure that all view the same display simultaneously. This feature is particularly useful when sharing and demonstrating applications, and can be enabled/ disabled by switching between moderator-lead and participant-lead approaches within the same session. *vClass* provides comprehensive support options including an online helpdesk and on-site instructor

orientation sessions. The product uses compression technology, requiring minimal system capacity and basic 28K dial-up connectivity for basic operations. As with similar products, these minimal requirements involve extended download times and operating delays in attempts to use multiple features of the product simultaneously. *vClass* runs on both PC and Macintosh platforms.

3. ***WebCT*** whiteboard (version 3.6.2) is a component of the integrated learning management system *WebCT*, considered to be one of the industry standards, although it is expensive to acquire and maintain. Unlimited site licenses cost up to US $50,000, which is evidently problematic for educational institutions in countries experiencing times of fiscal restraint. Reduced license charges are available for restricted numbers of learners. Third party hosting is not available. Although most of *WebCT*'s other applications utilise the Perl programming language, its whiteboard uses Java applet technology. It is password protected, and can be used simultaneously with other audio software such as *Yahoo Messenger*, although not with other *WebCT* features such as its chat and bulletin board. The whiteboard provides drawing tools, text and freehand scripting on a somewhat restrictive single page, and can be maximized to a full screen. Screen layout is easy to navigate and can be customised for aesthetic effect. It is uncluttered by advertising banners, and can be added to any page in the online course content, or made available as an external link. Course designers can allow or prevent users from uploading images and saving whiteboards. The whiteboard allows a portion of its image to be erased without the need to erase the entire board. In this manner, student errors can be highlighted and corrected without disrupting the rest of the display. *WebCT's* learning management system provides manuals and online support for all its features, including the whiteboard.

WebCT and its whiteboard can run on any computer that supports a Web browser and a virtual java machine (*Windows*, *Macintosh*, *Unix*). The whiteboard requires no changes to browser configuration, although, as with *WebCT* generally, *Internet Explorer* is recommended over *Netscape* to maximize stability. The stated product's minimal equipment requirements are *Windows 98* (64/ 128 Mb RAM), and *Windows 2000/ NT/ XP* (128/256 Mb RAM), although users with lower-end systems are unlikely to be able to use multiple features of the product simultaneously. With lower-speed Internet connections, slow image-loading times and software navigation are experienced. The product's sampling rate is high, producing clear images, but when the display is minimized considerable delays can occur when the whiteboard is updated. In our tests, using *Pentium 4* systems and high-speed connections, these delays ranged from 25 - 40 seconds. Inconsistencies in performance, indicated by frequent error messages, were noted in our attempts to upload images and save whiteboard palettes from remote sites.

Conclusions

Whiteboard techniques provide a unique perspective in collaborative learning, and are being increasingly used to convey online information that cannot easily be transmitted in text or image form – e.g., mathematical equations and visual design concepts. Each of the three products reviewed has advantages and limitations in the extent to which it performs these functions. All products can be used on lesser-capacity computer systems and over lower-speed Internet connections. By virtue of their nature, however, whiteboards need to be used in conjunction with other online applications (e.g., text-chat or audio tools), and each of these products – whether the freeware *Groupboard*, or the license-based *vClass* and *WebCT* – requires more than minimal system specifications in order to function smoothly alongside other applications. In selecting a whiteboard product for a specific situation, the user must decide whether it is preferable to use a 'stand-alone' product such as *Groupboard* in conjunction with

independent tools, or to purchase a larger package such as *vClass* and *WebCT*, which integrates numerous applications in a single framework.

N.B. Owing to the speed with which Web addresses are changed, the online references cited in this report may be outdated. They can be checked at the Athabasca University software evaluation site: http://cde.athabascau.ca/softeval/. Italicised product names in this report are assumed to be registered trademarks.

JPB. Technical Notes, Series Editor

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