4.4. Whiteboarding – graphic presentation and collaboration

Apart from the findings above, characteristic of most conferencing tools, whiteboarding adds an important visual channel to the communication context, with the display space visible to all the members of the class and flexibly managed by the teacher and/or students, which can be used to enhance the message and give an additional dimension to the instruction by using visual appeal. Displaying websites, pictures, drawing elements, writing straight on the whiteboard, highlighting parts of text, can all help to focus students’ attention on the task and facilitate comprehension.

The evaluation of the learning enhanced by the use of interactive whiteboards has already been commenced, both of the learning benefit (BECTA, 2007; Moss et al., 2007) and teachers’ attitudes (Glover, Miller, 2003), reporting especially added variety, easy access to ICT, clear visibility, with pupils of average and high prior attainment benefiting most from the use of the tool (BECTA, 2007). However, studies (Moss et al., 2007) also report that a less strong correlation between speed of delivery and effective teaching than the literature might suggest, with the resulting conclusion that the distinctive contribution made by interactive whiteboards will be a long-term process relying on what the technology can be actually used for. As for online whiteboarding tools, due to their rather ephemeral nature these applications still need careful investigation in terms of classroom implementation, especially with research that is longitudinal, focused on particular pedagogical practices, interventionist, design-focused, learner-centred and focused on alternative impact measures (Rudd, 2007).

4.4.1. Interactive whiteboards vs. online whiteboards and live annotation tools
An Interactive whiteboard (IWB) is a combination of hardware and software. The major element is a large, touch-controlled screen that works with a projector and a computer, the projector throws the computer’s desktop image onto the interactive whiteboard, which acts as both a monitor and an input device. This means users can write on it in digital ink or use a finger to control computer applications by pointing, clicking and dragging. A range of drawing, writing and highlighting options enable such operations to demonstrate ideas.

With the interactive whiteboard serving as an input/output device at the same time, flexible uses in terms of integrating multimedia are available at teacher’s disposal. For instance, users can connect to a school network digital video distribution system, teachers can record their instruction as digital video files and post the material for review by students at a later time, launch audio files while displaying tapescript at the same time. These functionalities are especially useful in case of digital courseware (IWB-compatible versions of well-established coursebooks, such as *Total English Digital* or *Cutting Edge Digital*).

While giving reasons for the use of interactive whiteboard in the classroom, Bell (2002) stresses such aspects as its capacity for demonstrations, the use of colours in display and marking having an effect on student responses, the accommodation of different learning styles (auditory, visual and kinaesthetic) by selecting tools to reinforce each other on the screen, favourable responses of students of all ages, as well as its seamless integration with other peripherals (such as a video camera). In terms of course planning and execution, Bell (2002) emphasises the fact that an interactive whiteboard in the classroom can compensate for limited computer access by individual students during a lesson, acting as a highly suitable tool for the constructivist educator.

Apart from highly enthusiastic responses, the use of interactive whiteboards encounters a number of problems, with some of them being summarised below:

- substantial costs involved in using the interactive whiteboard, with the lifetime of laptops and data projectors running it being severely reduced (BECTA, 2007);
- lack of interoperability between boards so that existing software and resources can be more widely used, as well as a need for interactive whiteboard materials to be developed for a wider range of subjects (BECTA, 2007);
- reduced accessibility for students with disabilities, as screen readers for the visually challenged cannot read the devices, and students with motor disabilities might not be able to operate the whiteboard in student-driven activities (Jackson, 2004);
• time-consuming nature of the lesson planning process, vulnerable to technology breakdown;
• the technology reinforcing a transmission style of whole class teaching, whilst pupils are increasingly reduced to a largely spectator role, reducing interactivity to what happens at the board, not what happens in the classroom (Moss et al., 2007);

On the other hand, Web-based whiteboards are synchronous communication tools used in distance education, providing the workspace for brainstorming-style discussions or small group meetings, fundamental to modern foreign language education (Redfern, Naughton, 2002). According to Good (2006), whiteboards possess digital capabilities for connecting people at a distance, enabling visual communication in a distance learning classroom with the features or marking-up, annotating and drawing on screen, together with concurrent text-based or audioconferencing. While they are software solutions only, they do not act as input devices allowing a range of learner responses, as is the case with interactive whiteboards. However, online whiteboards enable synchronous and asynchronous collaboration, in a text, audio and graphic mode, which is not something to be accomplished with interactive whiteboard. Whiteboarding tools have become an integral part or additionally installable add-on to web conferencing, presentation and online collaboration tools, as is the case with Blackboard, Skype or Bitwise Instant Messenger (see section 4.4.3 for a fuller description). A subgroup of online whiteboards, termed ‘screen annotation’ or ‘live annotation’ tools, are applications allowing text- and graphic-based collaboration independent of any specific platform or conferencing system (the examples are given in section 4.4.3.2 below).

As Good (2006) has it, typical features of a whiteboarding facility general include drawing capabilities (freehand, line, empty rectangle and ellipse, fill color choice and line thickness), pointing and marking (real-time/laser pointer, arrow-pointer, highlighter-emphasizer, numbered marker, marker with preset symbols, spotlight), text addition and deletion (text tool, individual and global eraser). Apart from these, the user should be given the options of importing/exporting a picture/screenshot, saving/loading annotations, hiding/displaying annotations, also to selected users, editing and moving individual annotation elements and engaging in text/audio interaction with multiple users. For instance, the universally known conferencing tool Microsoft NetMeeting (highly popular with operating systems prior to Windows Vista) included the following functionalities (after Good, 2006):
• Review, create, and update graphic information.
• Manipulate contents by clicking, dragging, and dropping information on the whiteboard with the mouse.
• Cut, copy and paste information from any Windows-based application into the Whiteboard.
• Use different-colored pointers to easily differentiate participants' comments.
• Save the Whiteboard contents for future reference.
• Load saved Whiteboard pages, enabling you to prepare information before a conference, then drag and drop it into the Whiteboard during a meeting.

4.4.2. Whiteboarding solutions
Interactive whiteboards have already started to gain ground in traditional classrooms, especially thanks to competitive promotional offers, however, due to fairly high cost, their availability is still limited. On the other hand, the whiteboarding solutions of various types freely available on the Internet can not only provide an interesting audio-graphic conferencing environment for distance or blended learning courses, but also serve as presentation and interaction tools in traditional face-to-face classrooms.

Though serving essentially the same purpose, namely enhancing text conferencing with whiteboard capabilities, the programs reviewed below differ substantially in quite a number of factors: the type of program, availability, range of functions, integration with coursebuilding tools. Thus, the choice of a particular whiteboarding solution should depend on the teacher’s computer literacy, availability of IT support, technological framework (e.g. availability of a website or a CMS), expected degree of control over participants, be consulted with an IT teacher/specialist (if there is one at hand) and suited to the needs of a particular teaching context.

4.4.2.1. Interactive Whiteboards (IWBs)
The first interactive whiteboard to be introduced to the market was SMART Board interactive whiteboard, a product of SMART Technologies in 1991 (Wikipedia, 2008). It is a touch-controlled screen that acts both as a monitor and an input device being connected with a projector and a computer. Users can write on the interactive whiteboard in digital ink or use a finger to control computer applications by pointing, clicking and dragging, just as with a desktop mouse. The SMART Board interactive whiteboard works with any program loaded or available on the host computer. Some applications commonly used with it are Microsoft PowerPoint, Excel and Word, and AutoCAD. As is stressed by Knowlton (2008), “a substantial amount of the utility of the SMART Board interactive whiteboard is derived from
the software”, which means that the basic functionality of the hardware itself has been exactly the same over the years, while what has changed (and is easily upgraded) is the toolkit operating the whiteboard and providing the drawing, highlighting and presenting options.

Its most frequent uses include operating software loaded onto the connected PC, using software to capture notes written on a whiteboard, translating cursive writing to text, annotating a program or a presentation or carrying out polls and quizzes using an integrated audience response system. However, there were also many problems reported while using the tool for presentation and teaching:

- Lag and imprecision which may make handwriting text unintelligible and require the user to draw more slowly.
- No free-hand creativity as when using fingertips or corner of erase block.
- More constraining and more time spent choosing the correct settings may break creative flow.
- Long startup time of the system (including PC) compared to just uncapping a whiteboard pen.
- Not suitable for persistent information like activity planning and monitoring.
- User needs to move around to avoid blocking the projector beam for front-projecting panels. (give the source)

4.4.2.2. Online conferencing systems with whiteboarding capabilities

Whiteboarding tools are often integral part of many web conferencing, presentation and online collaboration tools. Most full-featured conferencing tools include some form of whiteboard and associated toolset, and whiteboarding capabilities are provided either in the basic toolset or as a downloadable add-on (e.g., TalkAndWrite). Similarly, also selected Learning Management Systems (LMSs) have graphic conferencing abilities, not always termed ‘whiteboarding’ (e.g., A Virtual Classroom at Blackboard).

Blackboard (http://coursesites.blackboard.com) uses a Java applet ‘virtual classroom’ with a whiteboard, enabling users to engage in real-time discussions with other students, browse the websites suggested by the instructor, ask and answer questions from the instructor or other students. Verbal interaction is significantly enhanced by using the whiteboard to draw or display text and images, select and enlarge/move/cut/copy/paste/delete/group an item, draw free hand using a custom pen colour, enter text using the keyboard, draw a straight line, a square or a circle, finally, highlight an element with an arrow. The virtual whiteboard is well-integrated with the course contents, as by clicking at “Course Map” link the user can choose a specific piece of the course contents to share with the participants of the collaboration session.
Similarly, the instructor can use the “Group browser” function to load a website they would like to be displayed on the whiteboard. The users defined by the instructor as “Active” are able to ask questions during the session. It is especially notable that a virtual classroom session can be recorded for future use by the instructor or the class: archive recording can be started and stopped, as well as paused and un-paused any time during the session.

Figure X. A sample whiteboard at Blackboard.com (a virtual classroom).

TalkAndWrite (http://www.talkandwrite.com/), a whiteboard integrated with voice and video, is a plug-in for a well-known audio-conferencing tool Skype (http://www.skype.com), which simulates the interaction of two partners working side by side on a common document (Good, 2006). Thus, alongside exchanging ideas using voice, the partners can handwrite, draw, delete, highlight, insert text into a document being worked on. Focusing each other’s attention and highlighting changes is facilitated by using distinct mouse pointers, in different colour for users. In its free-of-charge version (TalkAndWrite Basic), the user can load documents and transfer pages with automatic reconnection and synchronization assurance. Work can be done both in on-line and off-line mode. However, the basic version does not allow saving, printing a document, inserting a new page or multiple pages work.
BitWise IM ([http://www.bitwiseim.com/](http://www.bitwiseim.com/)), is an instant messenger communication tool, offering a whiteboard as another channel of communication apart from text messaging and voice exchanges. As in other messenger services, it allows direct connect and sending messages to registered users without any external server using its own network. The whiteboard offered by BitWise allows visual and textual communication using freehand drawing, drawing a rectangle/circle/line, placing an image, adding text caption, and others. The advanced graphic features of the program encompass modifying all shapes by changing their colour or fill colour, using layers to bring objects on top of others, placing images from files retaining their transparency, integrating images with text in a convenient manner. Every one-on-one conversation has a dedicated shared whiteboard, however, it can be expanded with additional pages up to 100. Thanks to the fact that a whiteboard can be saved as an image (.jpg or .png) or in the BitWise whiteboard format, one is able to recreate a previously drawn whiteboard without repeating any of the operations. Thus, the session stopped at a particular moment (e.g., at the lesson end) can be resumed later with no loss of information. Alternatively, the whiteboard files saved as .jpg can be easily shared, opened and edited in other programs cross-platform.

Microsoft NetMeeting is the application already pre-installed on most PCs operating under Windows (termed Windows Meeting Space under Windows Vista), allowing chat sessions and videoconferencing for online collaboration to take place (Sierra, 1999; Lengel, 2003). Chat sessions are written communications and all the texts produced can be saved. A directory service is used to find and manage partners for discussions, who need to be found in the ‘buddy’ list. Thus, as a peer-to-peer tool, it does not require a server to run, resulting in much faster operation. However, the drawback to NetMeeting is that it only works within a corporate firewall (without considerable IT involvement). Windows Meeting Space allows collaboration with up to ten other people on the Internet, a local network, or a wireless ad hoc network, also set up automatically if the users are all in the same room. The program enables sharing desktop or any program with other meeting participants, distributing and co-editing documents, passing notes to other participants, or connecting to a network projector to give a presentation.

Vyew ([http://vyew.com/](http://vyew.com/)) includes live desktop sharing, whiteboard and the capability to present files to your audience from whatever platform, provided one’s browser is compatible (Good, 2006), available freely to use up to twenty participants. Desktops can be shared and saved using a built-in capture tool, while diagrams created with plug-ins such as DiagramVyew can be shared with others (Gube, 2008). The whiteboard in this tool compares
favorably to NetMeeting, plus the sessions are static, so the work can be resumed later to continue working on a problem. As Good (2006) adds, “Vyew users are provided a unique teleconferencing bridge number that all presenters and attendees can call into”.

Apart from the solutions described above, audio- graphic conferencing environments are also an element of other computer conferencing tools, such as Groove (http://www.groove.net) or LiVVe (http://www.livve.com – Starfire, 2003).

4.4.2.3. Screen capturing and annotation software

Another group of whiteboarding technologies are more appropriately called "screen annotation tools" (Good, 2006), as their primary purpose is to enable sharing screens and annotate and mark-up anything that is displayed. Screen annotation tools, both commercial downloadable software, freeware downloadable software and free online scripts, usually work independently of any specific application, however, often with specific requirements concerning the type and version of the Internet browser.

Groupboard (http://www.groupboard.com) is a set of multi-user Java applets, encompassing chat, voice conferencing, message board and whiteboard, which can be integrated with an instructor’s or a class webpage to be used for tutoring or distance learning. The whiteboard has customisable user interface (the basic Java user interface, 3d-look Javascript graphical user interface, or one of the instructor’s own design), ability to upload up to 4 background pictures (gif/jpeg/png/pdf) which can then be drawn on top of, saving up to 20 pictures to the whiteboard gallery; posting up to 50 messages in the message board and connecting up to 5 users at once. The most recommended way of using Groupboard is running it on one’s own server (Good, 2006), by getting the free HTML code for one’s page at http://www.groupboard.com/demo/gbregister.shtml, with the only limitations being that one cannot resize the whiteboard, the number of users logged on and pictures/messages saved are limited.
Thinkature (http://www.thinkature.com/) is a free Web based whiteboarding tool “geared more towards creating diagrams than drawing” (Walling, 2006). Features include, among others, easy text box adding, freeward drawing, a built-in chat feature and voice chat, with import of images from the Web or the user’s hard disc. The workspace enables visual communication via chat, drawing, or grabbing content from around the web (Gube, 2008). The tool is synchronous, so there is no need to hit reload or get an editing lock. Because Thinkature runs inside a Web browser with no special software, the users can join a workspace instantly and without worrying about versions, operating systems, or firewalls.

Imagination Cubed (http://www.imaginationcubed.com/LaunchPage) is a demonstrative collaborative whiteboarding space supported by a live screen recorder (Good, 2006). Based on fairly minimalist HTML/Flash-based interface, it is more appropriate for simple drawing than diagramming, due to lacking such advanced features as more developed shape support, chat or ability to delete drawn items. Due to simple user interface, it is recommended as easy to use not only by grown-up online workers, by young students as well (Good, 2006).
**VBDoodle** ([http://www.hopkinsprogramming.net/software/vbdoodle/](http://www.hopkinsprogramming.net/software/vbdoodle/)) is a freeware Windows-only software that allows screen capturing and annotation. It integrates basic text, highlighter, simple shapes, color and thickness choice (Good, 2006). Applications include presentations for business, education, conferences, and workshops.

**Virtual Board** ([http://lightools.fredisland.net/](http://lightools.fredisland.net/)), considered as “one of the richest and most advanced screen annotation tools available online” (Good, 2006), integrates screen capturing, live text annotation and markup, zooming and use of a clipart. Annotations can be saved and loaded. The graphic interface encompasses the tools for drawing freehand, plotting lines, drawing filled or empty rectangles, squares, ellipses and circles, displaying text in different colors, size, font and attributes on resizable cliparts, zooming in and out the whole or a part of a screen, as well as manage colours in many ways.

**Dabbleboard** ([http://www.dabbleboard.com/](http://www.dabbleboard.com/)) is an online whiteboard enabling creating frames of one’s user interface, drawing flow charts, creating network diagrams. One can create a personal Toolkit (a set of reusable drawing objects) or use pre-made ones (Gube, 2008). The flexible interface involves moving, resizing, deleting and replicating objects introduced, using drag-and-drop function to move previous graphic elements from a personal or public library. Sharing and real-time collaboration is enabled by viewing and editing the whiteboard space, thus allowing brainstorming ideas.

**Twiddla** ([http://www.twiddla.com/](http://www.twiddla.com/)) is a free, web-based meeting playground. The tool enables browsing websites and drawing on them, sharing sites and files, as well as communicating either using a chat channel or an audio option to communicate verbally (Gube, 2008), which seems to be especially useful in language instruction to enable multi-modal interaction. Twiddla is browser-independent, works without any plug-ins, downloads or firewall problems, and does not demand signing up to use the service.

**bubbl.us** is another free, web-based application of particular use for collaborative brainstorming (Gube, 2008), sporting multilingual support, also for Chinese and Japanese characters. The online application enables creating mind maps which can be saved, emailed or printed. Sharing the output with team members is possible also by embedding mind maps directly onto a webpage, either in the full access or read-only mode.

**Depicto** ([http://www.depicto.us/depicto/index.php](http://www.depicto.us/depicto/index.php)) allows uploading and annotating multiple digital images in real time. The tool accommodates unlimited number of online users and up to four concurrent chat users (Good, 2006), who can also show pictures to each other, as well as use drawing and writing tools, while communicating via chat. Art functionalities
(draw, undo, text buttons) as well as adding images and erasing previous steps are encompassed to allow sharing images and saving the entire project.

4.4.3. Practical classroom ideas based on whiteboarding

As is pointed out by Silva, de Oliveira Marcelo and Ferreira da Cruz (2008), the use of interactive whiteboards in a foreign language classroom involves the situations in which a wide range of stimuli (text, images, audio or video) are essential, the teacher wants to trigger learner responses (keyboard, mouse, touch screen, speech input or an audience response system), and various types of feedback (in text, image, audio or video forms) are going to be delivered. BECTA report (2007) stresses the fact that the interactive whiteboard is an ideal resource to support whole-class teaching, as it helps to focus pupils’ attention and increase their engagement in whole-class teaching. “Teachers tend to spend more time on whole-class teaching when they have an interactive whiteboard” (BECTA, 2007). In such a case, software-equipped interactive whiteboard is used as a “multi-modal portal, giving teachers the potential to use still images, moving images and sound, and when used in this way”. In this way, it can be more effective to address those learners who find text difficult as the only mode of communication.

Solvie (2004) describes the use of the interactive whiteboard to promote writing and reading, with a strong element of demonstration. The tasks included having students read, highlight, add and remove print from the text, with the work revisited, revised, printed and shared, both electronically and in print. Solvie (2004) enhanced reading instruction by using PowerPoint-made vocabulary slides, highlighting letter combinations, inflectional endings and graphemic components of the vocabulary studied. While using the Internet, the class benefited from underlining, circling or highlighting text found on Internet sites, thus creating meaning, making connections and developing understanding (Solvie, 2004).

When dealing with practical uses of IWBS, Adeniji (???) shows an interesting correlation of multimedia, the Internet and an IWB, recommending a number of online drag-and-drop, speedword, matching, hangman games. These colorful interactive resources using sound and flash animation, combined with varied response types and modes of work (individual/pair/whole class) makes interesting openings for grammar, vocabulary and pronunciation presentation and practice.

The use of online whiteboards in the language classroom is practically unlimited and depends only on the creativity of the teacher. On the one hand, what needs to be exploited in whiteboarding activities is the availability of different modes of interaction – both teacher-
students (a presentation mode) and students-students-teacher (a discussion mode). Thus, one group of activities can consist in the presentation of language items (articulation, lexis, grammatical structures) or content (culture-related information), given either by the teacher or a selected student(s). Alternatively, the opportunity of free interaction using a variety of channels opens interesting possibilities for productive tasks of various nature: brainstorming for topics or for vocabulary, guided or free discussion, verbal or visual reaction to the input provided (e.g., a picture, a slideshow, a movie).

The other important aspect of an interactive white board as an instructional tool is the simultaneous availability of different channels of communication (whiteboard space for visual input, text-based chat, Skype for audio), which are usually used concurrently to facilitate comprehension. Thanks to the possibility to see the material described in a text-based chat, students can develop their comprehension skills even with imperfect lexicon. On the other hand, similarly to the instructional uses of video, the teacher may purposefully turn off one of the channels during a certain part of the activity to stimulate learners’ production in a particular area. Thus, skilful manipulation of modes of interaction on the one hand and channels of communication on the other should lead to interesting didactic applications (see below for a few possible lesson scenarios as a model of in-class use of whiteboarding).

1. **Listening comprehension**

Pre-listening activity: students brainstorm vocabulary connected with the theme of the recording. The teacher draws, inserts images as files or makes textual clues on the whiteboard to elicit the desired lexical items from learners. Students use the chat channel to bring up ideas. The whole session is archived for individual vocabulary work.

2. **Reading comprehension**

Pre-reading activity: the whiteboard displays elements connected with the topic of the text (a title, a characteristic picture, a website on the topic). Students are encouraged to make inferences about the topic of the text, form expectations and use dictionaries to browse for possible vocabulary. The chat channel is used by learners to express their predictions, which will be later verified in the while-reading task.

3. **Writing**

Peer-revision and peer-assessment: the teacher creates focus groups, which use TalkAndWrite whiteboards with dedicated Skype accounts to work collaboratively on students’ essays. The essays are displayed in the TalkAndWrite window, learners are encouraged to highlight the errors to be corrected by the original writer. These operations are done in real-time and negotiated upon using Skype.
4. Speaking

A picture description information gap task: students work in pairs at computers turned their backs to each other, where one learner is to describe a picture given, while the other uses a dedicated whiteboard to draw whatever is being described. Both students see the drawing in real-time, and the describing student can freely modify the description to better fit the picture.

5. Pronunciation

Presentation of articulation: the teacher uses TalkAndWrite to display a text illustrating a particular sound (e.g., containing minimal pair sentences). The teacher uses the Skype connection to elicit the pronunciation of particular words, while TalkAndWrite whiteboard serves the purpose of highlighting the words to be pronounced or giving additional comments facilitating proper articulation.

References


