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Suitability Review of Common Synchronous, Live Online-Classroom Tools

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Review Of Common Synchronous Live Online Classroom Tools

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Abstract
While virtual learning environments (VLEs) such as Moodle and WebCT are now ubiquitous in most higher education institutes, live synchronous virtual classroom software is merely gaining in popularity. The first online meeting tools were tailored towards business requirements for remotely held meetings rather than educational purposes. The recent expansion of virtual classroom tools specific to education has changed this. Such software offers the standard features of streamed voice and video, yet purposely provides an array of additional features specifically designed to conduct classes online. While VLEs work optimally as a compliment to standard courses, Virtual-classrooms such as Adobe Connect Pro and Elluminate have the potential to transform distance education beyond previous limitations.

Since these tools are being used more and more within higher education, questions must be asked about how effective they ultimately can be in meeting learning requirements. More importantly, what are the best teaching and learning practices employed when conducting classes online in this way? This paper makes a comparative review of some of the most popular virtual-classroom tools in terms of what features they offer to educators and students in higher education.

A list of criteria crucial to each of these tools is compiled and a selection of the most popular are reviewed according to how well they meet these requirements. Certain obstacles and restrictions that arise are discussed with a view to identify and overcome them. Furthermore, opportunities are explored as to how virtual-classrooms might actively enhance teaching and learning rather than merely simulating it on the web. Along with a specific review of technical features, some observations are made as to how general features of these tools, such as instant messaging, might be enhanced to suit proven pedagogies, such as problem based and collaborative learning.

Introduction
Students with access to a VLE quickly come to expect course materials to be available online. While VLEs offer many additional features such online testing and student forums, in practice they are most commonly used as a content management system (CMS). The combination of meeting room software in conjunction with content management represents perhaps the greatest shift so far in how distance education can be delivered. Rather than merely granting the student access to a course page as a compliment to the physical class, a lecture can now be fully delivered remotely over the internet. Facilitators and students simply need a microphone, speakers and to log in at an agreed time.

With adequate broadband this can reasonably replicate an actual classroom environment. Commuting time is eliminated and a student who missed classes can even view the recordings later. Some have been skeptical about this new wave of delivery and liken it to a general demise in educational standards. One commentator for the Washington Post states:

> *"The typical 2030 faculty will likely be a collection of adjuncts alone in their apartments, using recycled syllabuses and administering multiple-choice tests from afar."* (Teachout, 2009).

Even if the majority of a course is eventually conducted online, some sort of hybrid model is likely to emerge. Examinations, for example, usually require student attendance on campus. Also, most of the communication is to the students via the instructor, with little possibility of communication between students due to the higher demands on bandwidth usage. While useful for meetings in a business setting or the occasional webcast, the standard model for a virtual classroom does not lend itself particularly well to collaborative or problem based learning. However, if in time technical resources can meet the demands of such open communications among students and teachers, then the future of the medium is assured.

A recent spate of acquisitions has seen larger companies veering towards a monopoly in the market. *Blackboard* for example, has recently acquired both *Wimba* and *Elluminate,* two highly popular virtual classroom tools (Elluminate, 2011). Cloud computing giant *Salesforce* acquired *Dimdim* in January 2011 (Dimdim, 2011). Certainly *Wimba* and *Elluminate* will now operate seamlessly within the Blackboard VLE. Yet aside from a prescriptive offering from a potential market leader, no virtual classroom object comes as a standard feature of any VLE. It is a separate software entity that may not integrate easily within one.

Features of a virtual classroom
Some features typically offered by virtual classroom tools include: VLE Integration, Desktop Sharing, Virtual Whiteboard, Recording and Streaming, Instant Messaging and Breakout Rooms

Integrated software used to conduct meetings online is nothing new. Skype has been a VoIP success for a number of years. The creation of tools specifically made for educational purposes however is proving to be a niche market. An integrated system of interactive whiteboards, desktop sharing and live audio/visual presentations are ideally suited to online teaching. Certain private enterprises such as *tutor.com* (Tutor.com, 2011) and *tutorvista.com* (Tutorvista, 2011) offer direct online tuition to a variety of students from primary level upwards. Such companies generally develop their own in-house software as students are charged per exact time online (usually per minute as in the case of tutor.com). More suitable to a college environment is a proprietary software tool that can be installed and managed internally.

Adobe Connect (Adobe, 2011) and *Microsoft Office Communicator* (OCS, 2011) offer most features required for teaching, yet both were designed primarily as conferencing tools within a business context. Neither, for example, integrates properly into Moodle or any other VLE. *Elluminate* on the other hand, has been purposely designed as a virtual classroom. Although Blackboard Inc. recently acquired Elluminate, it appears to be retaining all of its former features. The Open University began using Elluminate last year as a replacement for its

internally developed legacy system Lyceum (Sclater, 2010). *Ellumintate's breakout-room* facility and *participants-window* for peer communication gives it an edge over other systems that depend solely on communication from teacher to student.

An alternative to purchasing a proprietary software license is to use a hosted virtual classroom account. *WizIQ* (WizIQ 2011) provide hosted virtual classrooms free of charge as well as a paid version for more than 20 participants. *Dimdim* offer a similar service.

In 2008 Dimdim released an open source version that can be installed and managed on any network (Dimdim, 2008). In general, open-source installation and maintenance on a Linux server comes with a variety of unforeseen pitfalls. This particular version, however, is not without its critics in the open-source community. There have been no further updates since its release in 2008. The recent acquisition of Dimdim by Salesforce may or may not be good news for future open-source support.

Replacement or Enhancement?
The question however should be raised as to whether live, synchronous lectures should simply recreate the same experience as attending classes on campus. Flexibility in terms of travel is often marketed as the primary advantage to prospective students, but the potential exists for other opportunities to be explored as the standard lecture/tutorial model comes under significant re-assessment in recent years. Problem based learning (PBL) for instance is now properly established as a viable delivery method (Hmelo-Silver *et al*, 2006).

If a virtual classroom is to be used as a substitute for a standard classroom, the software should actually be capable of taking learning to levels beyond traditional approaches. An obvious enhancement is that sessions may be recorded and downloaded onto a range of devices. It has also been long established that should sufficient technology become readily available, a fully interactive online classroom is particularly suited to collaborative learning (Hiltz, 1990). Some applications are now allowing the facilitator to create *breakout* rooms during the main session whereby several smaller groups can work together during a supervised session.

Limitations of Desktop Sharing and Student Feedback
In addition to the limitation of lecturers not being physically present, there exist some technical issues that can impede progress. While desktop sharing is an invaluable tool in demonstrating the use of computer application to students over the web, it is difficult to record properly. The problem stems from the fact that the desktop sharing section greatly increases the size of the recorded file. For some tools this part of the session is simply not included in the recording. Another problem can arise when the desktop sharing portion is successfully recorded. Oftentimes, audio and visual is out of sync.

Most applications allow students the opportunity to speak privately with the tutor or corporately to the class at the discretion of the facilitator. *Microsoft Office Communicator* creates a very natural effect whereby the webcam image of the current speaker is automatically streamed to the other participants' screens. However, in low bandwidth situations, webcam video often interferes with VoIP quality and is often better disabled.
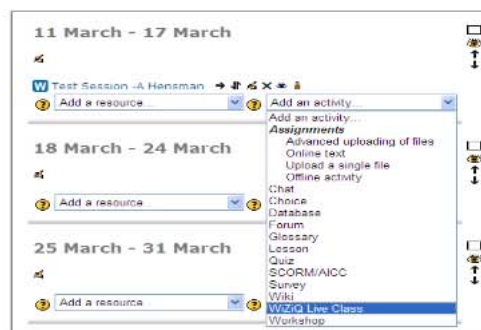
VLE Integration
One of the most popular VLEs in use is Moodle. Its popularity derives from it being open source and freely available. A 2007 survey by UK ICT agency *BESA* concluded that Moodle

was by far the most popular VLE in use within its sample of secondary schools and it came third in the primary section. (Besa, 2007). Like most VLEs, Moodle does not however include a virtual classroom as part of its suite of objects. Ideally, any third party online classroom software should properly integrate into Moodle (and/or a selection of established VLEs). A single sign on to the VLE should be all that is required to access the virtual classroom, whether for a teacher scheduling a class or a student entering one.

Integration can be made possible by means of some plug-in software provided by the vendor. Students and lecturers should have the feel that the package seamlessly integrates into the VLE, even though it may operate as a separate entity as illustrated in the example in Figure 1. Full VLE integration means that the date/time scheduler simply appears to lectures as another object when creating a new class, similar to the task of setting up an online quiz. From the student's perspective access to the class should be granted via a single sign in, i.e. a student's Moodle login should suffice for entry into the classroom even though it is a separate entity.

Figure 1: Adding a live WizIQ class object via Moodle

WizIQ, which offers free hosted classrooms for small numbers, provides a full integration package for Moodle. *Dimdim* also has integrations for Moodle, Claroline and Docebo. *Elluminate and Wimba* currently offer integrations for Moodle, Sakai, Blackboard, Desire2Learn, PearsonLearningStudio as well as offering the standard API.

Adobe Connect does not yet offer VLE integration solutions. While classes can still be represented as links to a URL, it means the additional task of setting up this URL is necessary every time a class is run by a teacher. Some vendors often provide a web services API for potential integration into a company's online system which may not even operate as a VLE. The overhead in implementation and maintenance however can be high.

Instant Messaging (IM)
Instant messaging is now a somewhat antiquated communications device and can be counterproductive during a class session. It is often claimed in marketing strategies that students who would otherwise hesitate to speak up, are given a voice online. In larger classes, instant messaging can actually serve as a distraction as waves of comments are posted arbitrarily on a message board interrupting the flow of the lecture. This is the online equivalent of several students calling out questions at the same time during a physical class. A long list of student comments addressed either to each other or the teacher cannot possibly be responded to in an organized manner.

While further refinement is necessary, using some system where students raise a virtual hand prior to posing questions seems more appropriate. Surely if proper interactivity is the goal, IM should be used in clarifying communications rather than be the primary method of communication. The system of interaction in Elluminate's *participants* window as shown in Figure 2 stands far beyond its competitors in this regard.
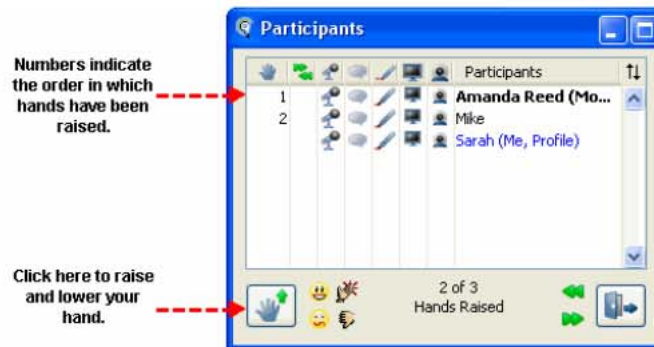

Figure 2: Elluminate's *participants* window listing raised hands and corresponding emoticons.

Breakout rooms

The maximum number of students allowable during a session is often a decisive factor in selecting a particular tool. However, like the traditional classroom, if real interaction between teacher and student is to take place, numbers should be kept manageable. Since collaborative learning is becoming more applicable to a variety of courses, it should also be possible within a virtual class. During a session the facilitator should be able to move small groups of students into a breakout room and then move them back to the main session after some time. The teacher should also be able to easily step in and out of these rooms. While the effect can still be created without this feature, logistics can be cumbersome and corporate addressing of all groups at the same time is not possible.

The breakout room feature has been severely lacking in most tools until recently. *Adobe Connect Pro* for example has only addressed the issue in its latest version. *Microsoft Office Communicator* and *Elluminate* both allow breakout rooms as shown in Figure 3. Free tools such as *WizIQ* and *DimDim* which have only recently upgraded from their beta editions do not offer breakout rooms.
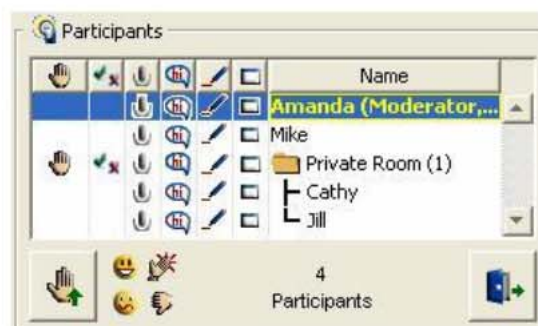

Figure 3: Elluminate's participants window is updated with breakout rooms.

Conclusion

This paper examined some of features an online classroom tool should provide if it is to be successful in both simulating and enhancing a natural classroom environment. Due to the importance of VLEs to higher education, it seems reasonable that an online classroom should integrate easily into the environment. The need for breakout rooms should not be overlooked considering the increasing emphasis on collaborative learning. With the rising popularity of hand held mobile phone devices, it also seems reasonable that online classrooms become compatible with them for both playback and streaming. As long as differentiated learning is achievable, there is no reason why such tools cannot at least provide the same quality as a traditional classroom. Of course, progress is better served by trying to enhance the learning environment with technology rather than merely simulating a standard classroom.

Unlike traditional teaching, there are still no official quality assurance standards in place for teaching online. This is likely to change as the market expands. Smaller groups seem well suited to online classes as demonstrated by the many one to one tuition services. A possible niche is thus in the provision of industry standard qualifications. Courses leading to certifications in *Cisco, Microsoft,* etc. are generally delivered to smaller groups of adult learners who can afford little disruption to their schedules. From the experiences of early adapters and a few slight refinements in the software, the future looks bright for the virtual classroom.

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