

FINDING YOUR VOICE ONLINE - An Inquiry into the Use of Online Voice Applications in Higher Education

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Abstract

The majority of Internet communications between student and teacher in online educational interactions is still based predominantly on asynchronous written text, with email absorbing the lion's share of that communication. While there are technical difficulties facing those who might wish to explore more dynamic forms of Information and Communications Technologies (ICTs), there are also significant pedagogical barriers preventing teaching staff adopting these tools as part of their core teaching repertoire or practice. Many lecturers are still very unsure how to make best use of the Internet in general, let alone how to exploit the technically and pedagogically more challenging synchronous tools available.

The Internet is not just a passive resource. There is now a wide range of tools on the Internet that enable the transmission of voice. To date, the power of synchronous voice interaction has been little used in online educational delivery and, given that speech is the main mode of human communication, this is somewhat surprising. Even with increasing bandwidth for many users, and the increase in computer processing power, the use of voice online is still largely confined to groups of dedicated home users who are in many cases communicating with lecturers and peers in an informal capacity via home dial-up connections. This is often due to a reluctance of Information Technology departments within educational institutions to allow such traffic through their firewalls. It has been assumed too that ICTs, and the use of voice in particular, are tools suitable for use only in truly online teaching situations where teacher and students are remote from each other, but there is great potential for voice over the Internet to add texture and richness to campus based programs.

This article is the result of a six month enquiry into the use of online voice tools. It does not pretend to be exhaustive, and I recognize that there may be a great many excellent voice tools for education that are not mentioned here. It does attempt to give an overview of what types of tools are available, and describe how they are being used in learning environments.

Synchronous online sessions cannot equal the subtlety, the humor, the energy, and the excitement of the real life (RL, as it is known in cyber circles) classroom, but it affords more immediacy than asynchronous communication alone. Dialogue and conversation are by definition immediate interchanges, are synchronous, and since Plato dialogue and conversation have been an integral part of teaching and learning. Immediate interchanges have an energy and earnestness that can't be matched by deferred responses, delayed replies. (Haefner 2000: para.15)

Circa 1998. Online learning appears on the radar screens of early adopters of educational technology. Early forms of online education were typically built around an asynchronous mode of delivery, and housed in content management systems designed specifically to deliver this content – in products like WebCT, or the Learning Manager. These early forms of online education assumed that all online students subscribed to the *anytime anywhere any place* doctrine of utter flexibility, where a student has complete freedom to access the course in their own time, and their needs would be adequately met by providing content in asynchronous learning environments.

The inefficacy of these early models of online education is well documented. Jasinski found there was ‘... a whole library of online products gathering dust on virtual shelves’ (2001: para. 2). They were devoid of any real sense of human interaction, with a model of delivery that saw the teacher’s role as essentially passive, once the pre-packaged content was made available to the student, - only requiring a response when a student asked for assistance or submitted assignments. Completion rates remained low, and the majority of students left this form of delivery to those highly motivated and literate types who could succeed in self-paced mode at a distance. This was not the typical profile of the majority of its students in the Australian Vocational Education and Training (VET) sector. Mitchell (2002, citing Warner et al. 1998) noted that ‘From the survey of 234 VET students...5% of students describe themselves as self-directed learners, which is a substantial increase from Warner et al’s (1998) finding that only 28% of VET students were ready for flexible delivery and online learning. On the other hand, 72.5% prefer to learn through hands-on practice’(2002: 5).

Most online students needed their teachers to take on a more proactive role – pre-empting problems before they occurred, checking if students were coping with the course - and this element of human interaction was built into the next generation of online courses. This was typically done via asynchronous text discussion forums. More enlightened teachers designed activities that required students to share opinions on issues, and offered social spaces in these forums where those who wished could take the opportunity of getting to know each other. The second stage of Salmon’s (2000) five stage model emphasizes the importance of this social component of online courses. Learning management systems offered synchronous written text based chat tools, but few made regular use of them, and most saw them as a social tool that had no place in serious instruction.

In my own online teaching over a five year period I had always made regular use of synchronous chat, and became reasonably skilled in using it as a formal teaching tool. Most objections to the use of synchronous tools centre on their time-bound nature and the difficulty associated with getting everyone together at the same time, but adding opportunities for synchronous contact is more about adding value and flexibility, and catering for learner preferences:

Field Independent learners are not going to like, or want to engage in, a great deal of interaction. On the other side, Field Dependent students not only want the interaction, they are not going to be successful with a minimal amount. The key here is for the facilitator to have a clear picture of each student's style of learning and incorporate techniques to accommodate the differences. (J. Kroll Wheeler 2003, pers. comm., 22 May)

And this may apply equally to teachers.

Why are individual differences among faculty ignored?Just as new applications of technology have made it possible to consider more realistically and intentionally different learning needs, so has it become possible to enable faculty to use their own different gifts and accomplishments more effectively to improve teaching and learning. (Gilbert, n.d., para.1 & 3.)

We have reached a new point in the evolution of educational technologies where there is a range of synchronous interaction tools available that are considerably more dynamic than written text chat. Online audio, or voice over IP (VoIP) has come of age, and is now even a viable option over home dial-up connections. Desktop webcams, though still unstable over connections other than broadband, proliferate. There are a range of VoIP tools with two-way text and audio capability, including virtual classroom tools with provision for display of graphics that perform adequately over a 56 kbps connection. Many of these tools can be used to bridge campus based and off campus students in the same teaching session. Some tools, Silicon Chalk, for example, are being designed specifically for this purpose. This new generation of interactive tools is presenting a challenge to what might now be referred to as the more traditional paradigm of online or distance delivery.

Most online learning is currently supported via asynchronous text-based email and conferencing for reasons of cost and bandwidth limitation rather than pedagogical advantage. (Baggaley 2003:1)

The triumvirate of asynchronous delivery, Learning Management Systems, and centralized Information Technology (IT) control maintains the traditional paradigm of online delivery, and each of these three pillars reinforces the others. Many institutions have made large investments in Learning Management Systems like WebCT and Blackboard that were primarily designed to deliver content and interaction asynchronously, and these platforms are typically under centralised IT control. Such is the nexus between platforms like WebCT and asynchronous delivery that many faculty simply equate them with online learning. Online learning *is* WebCT. Online education *means* asynchronous delivery, and IT support staff came to view it in the

same way. These platforms were easily administered centrally, security risks were low (Even so, some tried to ban text based chat.) and made only low demands on available bandwidth.

Enter a new breed of tools. The Teaching, Learning, and Technology (TLT) group speaks of low threshold applications (LTAs).

A[n] LTA is a teaching/learning application of information technology that is reliable, accessible, easy to learn, non-intimidating and (incrementally) inexpensive. Each LTA has observable positive consequences, and contributes to important long term changes in teaching and/or learning.' (TLT Group, n.d., para.1)

President, Steven W. Gilbert expands further:

The potential user (teacher or learner) perceives an LTA as NOT challenging, not intimidating, not requiring a lot of additional work or new thinking. LTAs... are also 'low-threshold' in the sense of having low INCREMENTAL costs for purchase, training, support, and maintenance. (TLT Group, n.d., citing Gilbert, para. 1.)

The ability to work well over low bandwidth connections (56 kbps or less) should be added to this definition of LTAs, and the implementation of some of the tools described as LTAs requires new thinking. 'Firewalls of the mind' (Stevens, 2001) can be a significant barrier to effective implementation of these tools. Some of these so-called LTAs are designed for deployment in synchronous elearning environments. While the TLT's definition of LTAs is useful for delineating the desirable characteristics of a piece of software, the term LTA is sometimes used more in hope rather than being an accurate description of what is required to implement these tools. The use of audio '...has a slightly higher threshold of entry than text', (P. Stacey, 2003 pers. comm., 2nd July) and involves challenging traditional notions of online delivery. Perhaps a graded scale of low (LTA) through medium (MTA) to high threshold applications (HTA) may be a more accurate and useful categorization of these tools. The software evaluation project hosted by Athabasca University's Centre for Distance Education attempts such a grading by addressing issues like intuitivity, and level of competence.

These 'new breed' tools include Instant Messengers (Yahoo, MSN, AOL, ICQ), spoken text chat rooms (Wimba, Paltalk), peer to peer technologies like groove (Fisher, 2002), or fully featured virtual classrooms like HorizonLive, Elluminate, and Centra. All of these tools represent a departure from the traditional paradigm of online or distance delivery because they encourage and promote synchronous interactions, and they represent a significantly higher security risk for those who are guardians of our networks.

Security is an enabler. So says Denis Falland, Senior IT Security Adviser for the Department of Further Education, Employment, Science and Technology in of South Australia. This is not the view typically held by lecturing staff in educational

organizations, but it is a view worthy of some consideration. 'If there were no firewalls the whole system would grind to a halt within days' (D. Falland, 2003: pers. comm., 8 August). There are good reasons for firewalls. The one commonly understood and accepted is protection against viruses and hackers, but another important function of the firewall is to ensure equal access to available bandwidth for all users. For example, if all metropolitan users were given access to streaming audio/video, speed of access for regional users may be drastically reduced. So IT security measures are there to protect our networks, our computers, and the users of those networks. And the use of synchronous and/or voice based tools *legitimately* pose added bandwidth and security concerns.

The other side of this argument is that lecturing staff wishing to offer their students higher levels of interactivity via the use of synchronous and/or voice based tools, thereby implementing good Internet teaching practice, are prevented from doing so from within their institutions' networks. The result of this is that many 'mavericks' choose to work from beyond institutional firewalls, often from home offices where they are free to choose the set of tools they deem necessary for effective online teaching. Innovators have a tendency to deviant behaviour, and like mavericks, tend to operate outside the realms of compliance (Jasinski, 2003). Some view these innovators working from home beyond the firewalls as mavericks or troublemakers, when in fact these same people may be an organisation's innovators and (potential) educational leaders.

Institutions have a choice here, and the choice they make may well dictate the future of online teaching for their organisation. While acknowledging the difficulty for those charged with maintaining the security of IT networks, a blanket 'no' to innovative lecturers' requests to use a new tool in their teaching, should not be seen as acceptable practice. This may drive the innovative lecturers off campus to their home office, more than likely never to return. While many large distance education providers already have large numbers of teaching staff working online off campus, the majority are using the institution's network and are still therefore hamstrung by firewall restrictions.

VOICE APPLICATIONS

There is a multitude of voice applications already available on the Internet. All of them have the potential to be effectively incorporated into the delivery of elearning, and many of them facilitate a level of interaction markedly more dynamic than that possible via written text. See Related Websites section for more information.

Online voice interactions can:

- be synchronous or asynchronous
- take the form of live conversations using the voice chat feature of the predominant instant messenger programs like Yahoo, MSN, AOL, ICQ, or dedicated voice chat tools like Paltalk and Wimba Voice Direct
- be shared asynchronously via voice email (Pure Voice), Wimba email or spoken discussion forums (Wimba)

- be full duplex where participants engage in a flowing two way conversation much as we do in a telephone call, but this is still rare in existing tools. Yahoo Messenger is a free tool that is close to full duplex
- be 'one way' or semi-duplex, where a participant has to wait for the previous speaker to finish before responding. This is how most currently available tools operate. 'These are not insurmountable problems; they are merely features that students will need to anticipate if they are to appreciate the benefits of VOIP (Foreman, 2003; para.16).'
- be in the form of voice input only from a single source. This type of approach is typically used for listening to lectures in asynchronous mode. Many higher education institutions are doing this. In Australia, Deakin University and the University of Western Australia have embarked on the process of recording lectures for later retrieval by students. Note: This may not be the best way for academics to reconceptualise their teacher-centric methodologies
- be in the form of voice input and text chat output (synchronous events where a remote speaker addresses a class group who can reply only via written text). This is typically what occurs with tools like Real Player. It has the advantage of the teacher being the only one with the capability of speaking, and makes role definition clear. The teacher talks, students text chat. Although teacher-centric and unbalanced in relation to the distribution of power, ie. whoever has the microphone essentially has the floor and is the main focus of attention, this model works well. Listeners are free to communicate with the lecturer or other students at any time via the text chat, and as long as the lecturer monitors the text chat closely and responds accordingly, it can be quite an inclusive experience for students.
- include both voice and text in synchronous interactions (see more in Classroom of the Future section below)
- include voice and graphic material in asynchronous mode using programs like Powerpoint, Impactica or in synchronous mode using virtual classrooms like HorizonLive and Elluminate (See Related Websites section for more information.)
- include video, or graphic representation of 3D worlds using avatars. Though video is often used in tandem with voice chat via personal webcams, and the educational potential of 3D worlds such as Active Worlds is enormous, the focus of the current paper is on those applications where voice is the primary means of engagement. As '...there will be [only] 1 million broadband users in Australia in 2005' (Ossipoff 2003, pers. comm. 4th December) and Internet video for dial-up users is still of questionable quality, this article will not address the use of video and 3D animation due to the fact that most of the world does not surf the Net on broadband.
- take the form of audioblogs. This is one of the most recent applications of voice technology, and is usually done in conjunction with the telephone. Users call a designated telephone number and leave a recorded message, which is then published to a specified webpage.
- employ voice recognition technologies that convert spoken word to written text.

The focus of this paper is on those voice interactions that include the student as a contributor in the dialogue – a participative model (rather than broadcast), or what Laurillard (2002) called adaptive technologies: media that allow learners to interact with learning material in an exploratory way. Such participative interactions are mainly synchronous, but can be asynchronous, as in the case of Wimba voice boards and voice email.

How are these tools being used?

Language teachers were perhaps the first teachers to make use of online voice tools. The auditory component of language learning (people need to hear a language to know how to speak it) makes an obvious case for an important role for voice tools. My research over the last six months however reveals that voice interactions are happening across all disciplines, often in the background – at home, beyond the firewalls – informally. Whether these interactions can or should assume a more formal role in the teaching process is an interesting question.

Before looking at specific applications of voice tools in educational settings, let's examine some generic properties of this type of interaction. When people are asked why they like using talking online they generally mention things like:

- providing humanity to the disembodied Net learning experience
- real time interaction that approximates f2f relationships
- intimacy/closeness/warmth
- collegiality
- immediate support (Arbaugh 2001; Chickering & Gamson n.d. para.4)
- better social relations
- more dynamic
- greater interactivity
- emotion
- connection.

These are all issues related to what Krashen (1981) termed 'affective filters'. When learners are bored, angry, frustrated, nervous, unmotivated or stressed, they may not be receptive to input and so they 'screen' the input. This screen is referred to as the affective filter. Some learners need the more human contact that synchronous and particularly voice events provide, and the more attuned a student is to the learning environment, and to the people they share that environment with, the more likely it is that effective learning will occur. Learning is fundamentally social (Hentschel 2001, citing Seely Brown & Duguid, 1991), and many students *and* teachers enjoy this aspect of the distance learning relationship, and are more motivated to participate in the teaching and learning process if they feel a meaningful connection between teachers and students in the shared learning space. See Related Websites section for more information.

Example #1 – Access to Guest Experts/Remote Lecturers

Aiden Yeh and Anne Fox are English as Foreign Language (EFL) teachers in Taiwan and Denmark respectively. They wanted their students to have real time conversations with native English speakers so they invited remote guest lecturers to talk to their students as part of a regular on campus class. In Aiden's case she chose to use the voice capability of the free Yahoo Messenger. Anne chose a similar activity with her students in Denmark using the Wimba Voice Direct chat room.

There were problems associated with these events, both technical and in relation to the students' initial unwillingness to speak to strangers. These two examples highlight a superb use of synchronous technologies – the fact that you can invite visiting experts or guest lecturers into your classroom, real or virtual.

Example #2 – Attending Remote Meetings

Imagine you teach a class in Small Business Management in Australia. Imagine that your class is able to virtually attend a meeting of Small Business practitioners at a breakfast in Chicago. It can be done using simple webcasting technology. Your class could log into a webcast of this breakfast meeting in Chicago, and later discuss whether the issues facing small business in Chicago were the same as in the local context, or even participate in the discussion and explore shared solutions to common problems.

This kind of event is very easy to orchestrate. Using a dedicated voice chat tool like any of the Instant Messengers, or a simple affordable virtual classroom like that available from Talking Communities, you can take your classroom to the world, and have them participate in authentic events – education faculty staff meetings for trainee teachers, a meeting of aged care workers discussing workplace procedures for Community Services workers in training, San Diego zoo staff discussing the design of a new animal exhibit for zoology students – the possibilities are only limited by the imagination. All it requires is for a 'chairperson' at the remote site to wear a lapel microphone (mic) connected to an Internet enabled Personal Computer, and a further remote mic or two for other participants, and students in your class can be part of these routine workday events without moving from their classrooms or homes.

Example #3 – Student Support

Student support or counselling staff have been reluctant to use synchronous chat for online counselling or academic support. It lacks the immediacy and humanity for sensitive handling of delicate issues. Some student support lecturers are now reconsidering.

As a learning support lecturer I could voicemail the student with responses and 'talk' the student through any Maths problems, for example, or communicate with the student using the whiteboard in a virtual classroom. When we were trained as teachers we focused more on the psychology of education. Although

social education was important - with this new technology I think there is a major shift to social education. (K. Wise 2003, pers. comm., 6 August)

Example #4 – Oral Presentations

Cliff Layton (Rogers State University) uses Paltalk (another reliable, free VoIP tool) successfully during ‘office hours’, and assessment of students’ oral presentations. (Office hours are those advertised times when a teacher is available to meet with students synchronously. This kind of interaction is typically one on one, or teacher to small group.)

I have had very good success with PalTalk, particularly in my Emerging Technologies classes in which multiuser audio/text chat is central to class functioning. The tool is used for office hours communication, online (remote) presentations by students to students (and me), and used by students with each other. (C. Layton, 2003, pers. comm., 15 July)

Example #5 - Professional Development for Lecturing Staff

An extremely efficient and effective use of voice technologies is to participate in conferences. It is very possible for students or teachers with these technologies to take an active part in conferences they can’t physically attend. (See Related Websites information for more information)

Other Uses of Synchronous Tools

A CLASSROOM OF THE FUTURE

The use of synchronous/voice based technologies need not only benefit staff and students of off campus courses. Much elearning (including online learning), is currently offered in a blended mode of on and off campus delivery. Recent virtual classroom tools make it possible to truly combine face-to-face and virtual participants in the same live events. Silicon Chalk, which has been specifically designed for this purpose, ‘...believe[s] in the future of the classroom, but also recognize[s] that learning is rapidly evolving’ (2003: para. 1), and other products like Elluminate, HorizonLive, and Centra offer this same seamless knitting of face-to-face and remote delivery by allowing recording of spoken and written communications for later posting to the Web. In this model face-to-face students experience the content and discussion in the classroom in the traditional way. Remote students can access the lesson at the same time by logging into the virtual classroom and hear and see everything that is presented in the classroom. Any student not able to participate in the class synchronously can view the lesson asynchronously via the archive or recording posted on the Web.

This ‘classroom of the future’ may present a model of teaching that is the perfect blended learning solution. It caters for team teaching arrangements, satisfies various learning style preferences, and affords students opportunity to experience the class

synchronously or asynchronously. See Related Web Links for an archive of a session from such a classroom of the future.

Another advantage of these synchronous tools is the fact that they remain open for student use outside of class times. Students can use them as a social space, or for seminars or small group work with or without the assistance of a teacher. They enable regular and informal contact between students that is not possible in other forms of distance delivery. They foster participative behaviour in the learning environment, as opposed to the more passive experience of the broadcast model that characterizes many asynchronous environments.

It should be noted that synchronous tools can also lend themselves very easily to the more traditional 'stand and deliver' broadcast model, and many fear that the re-introduction of synchronous approaches into the online arena will only usher back in a paradigm that asynchronous deliveries have helped to dispel i.e. the 'sage on the stage' teacher lecturing at length to students who are reduced to mere note-takers. Some would argue that the spread of Internet based tools for immediate communication, and the advent of a digitally wired generation of students (Prensky, 2000), has made it less likely that future students will accept that form of delivery. Instant Messengers, and other text based chat programs make it possible for participants in online classes to talk to each other via written text while listening to lectures. Shirky (2002) gives a challenging analysis of how this can work in practice. Seventy five per cent of US college students regularly use Instant Messaging tools (Oblinger 2003, pers. comm., 7 May). Virtual classroom tools allow cross channeling – participants listening to a presentation can now discuss the presentation while it is in progress, and ask questions of the lecturer, and of each other. These multiple modes of communication mean that online presenters need a different skill set to the traditional lecturer. Presenters *and* participants in online sessions have access to interactive tools – better then to frequently inject interactive activities into your presentation to break up your monologue: pause for questions, address comments and questions appearing in the text chat, poll participants on issues related to the presentation, and ask others, perhaps co-presenters, to speak. Online presenters in this mode of delivery are operating much as radio presenters. They are presenting to an unseen audience and need strategies, other than talking, to engage their unseen audience.

What are some of these strategies that teachers in classrooms of the future need to employ? The Elluminate Newslite email newsletter provided the following tips:

- Greet participants as they join your session and assign them privileges
- Speak clearly and don't rush
- Ask questions and provide opportunities for interaction by polling the class at various intervals to get their feedback
- Animate delivery
- look at the whole screen, not just the whiteboard area.
- encourage participants to respond and raise their hand when they have a question or comment

- use the whiteboard to help with your delivery. For example, use the highlighter to call attention to specific regions on the screen.
- include features, such as application sharing, Web push, and breakout rooms, to help deliver content. (December 2003)

Matt Wasowski from HorizonLive offered (and modelled) the following strategies to ensure engaging, online, live sessions in his excellent session on ‘The Role of the Live Online Presenter’, as part of the TCC 2003 conference:

- make it personable, develop a sense of community
- get photos of participants beforehand and post a webpage for viewing during the presentation
- facilitate group discussion
- create opportunities for one-one interaction
- co-present
- do something interactive every 3-4 minutes of a live presentation
- demand attention, for example, direct questions to individuals (cold calling). (This is an interesting point as it is often the case in online sessions that participants chat among themselves and can wander off topic, and may indeed be multi-tasking away in other windows away from the presentation.) While this freedom to 'wander' is not to be stifled in my opinion, presenters obviously have the right to call people to attention. (M. Wasowski 2003, pers. comm., 24 April)

Which Tools for What Purpose?

A comprehensive review of many available softwares for synchronous and/or voice interaction is conducted on an ongoing basis by Masters students at Athabasca University and these pages will answer many of the questions that lecturers embarking on the process of choosing an appropriate tool will ask: price, ease of download and installation, ease of use, suitability for specific purposes. See Related Web Sites for further information.

MY WISH LIST

If I had unlimited funds and complete freedom with respect to firewalls and security issues, these would be my choices.

For **one-on-one support**, or **small group meetings** – **Yahoo Messenger**. It's free, reliable, robust, easy to use, and is full duplex (allows natural two way communication where people can interrupt each other as we do in normal conversation.)

For whole class work requiring display of graphic material and/or webpages there are 3 choices: **Talking Communities**, **Elluminate** or **HorizonLive**. Elluminate and HorizonLive are hard to separate but Elluminate probably just has the edge.

Pound for pound, I believe the **Talking Communities** virtual classroom is the best value tool around. It is simple to install, easy to use, has an uncluttered interface, has two way audio and text communication, and a browser display window for showing webpages. It allows all users to record presentations on their hard drive, and has rooms available for rent or purchase at very affordable prices. It does not however accommodate Mac users, and it can be problematic getting it through firewalls. Although they do profess to having a 'stealth version' that will get through anything!

Elluminate and HorizonLive are far more sophisticated fully featured virtual classroom tools and are priced accordingly. They offer all the features that tools like Talking Communities do, and much more besides. They are Mac friendly, have polling and quiz tools, whiteboard, equation editors for Maths or Numeracy teachers, and a range of interactive engagers like a hands-up button to indicate that you want to speak, and ability to use emoticons. To purchase outright, these tools come with a price tag in the same vein as Learning Management Systems like WebCT and Blackboard, but fortunately Elluminate has moved to providing short term leasing models that makes its use by cash strapped organizations a possibility.

For supplementing synchronous (f2f or distance) delivery with threaded voice discussion a Wimba Voice Board is a must. Wimba is a company that has specialized for some years in the creation of voice tools with a keen eye on the needs of the education market, and its voice boards occupy a niche all their own. Threaded discussions have been the lifeblood of many online courses and as successful as they've been, there are a number of groups who don't feel comfortable using them. People with low levels of literacy, those from trade or more practically oriented vocational backgrounds, non-native speakers of the host language, indigenous teachers and students who prefer an oral mode of communication, people with disabilities, and those with poor or slow typing skills are just some of the groups who may prefer to participate in spoken discussions. See Related Web links for further information.

Conclusion

This article has presented an overview of what types of online voice tools are available, and provided some insight into how they are being used in educational learning environments. VoIP has arrived as a stable technology. It is reliable, and of sufficient quality over low bandwidth connections (28.8 kbps or more) to be employed as part of formal instruction for face to face and online students. The major barriers to its wider implementation are the twin firewalls – the necessary evil of IT security firewalls, and the pedagogical firewalls of the mind.

VoIP may well be an interim technology. Increasing bandwidth and computer processing power will undoubtedly lead to the use of desktop webcams and video-conferencing systems as the standard means of Internet communication, but it will be several years yet before the majority of home users are on broadband. If one presumes to be delivering to students who may be logging on from home, it makes sense to be utilizing technologies that will not frustrate them. Video over low bandwidth Internet connections is still a frustrating experience, (Finkelstein 2003) and VoIP technology

can enable teachers and students to find their voice online, both technically, and in the more empowering sense of joint ownership of course content, (Jonassen 1994) with increased levels of engagement and participation in their class or community.

In the meantime, the skills gained as effective operators in the unseen world of voice-to-voice interactions will transfer easily to the Internet video environment. We will have to wait and see if educators automatically gravitate to video teaching online when it becomes widely available. In this technologically advanced age the use of radio is increasing. It may be that in many cases we don't need to see our interlocutors over the Internet, and that hearing our voices may be connection enough.

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Related Websites

This article draws heavily on the data from the trial and discussion of the tools and methodologies under review at <http://users.chariot.net.au/~michaelc/fll/blog.htm>

LearningTimes 'an open and exciting community for educators'

<http://learningtimes.org>

(People wishing to play the Learning Times archives below need to be members of LearningTimes. Required software will download and install automatically.)

Software Evaluation

Athabasca University Centre of Distance Education; <http://cde.athabascau.ca/softeval/>

An alternative site hosted by the enigmatic Robin Good (aka Luigi Canali De Rossi) is at

http://www.masternewmedia.org/2003/09/03/best_new_tools_for_web_conferencing_and_live_collaboration.htm.

Voice Tools

Pal Talk <http://www.paltalk.com>

Wimba Voice Tools Wimba voice boards cannot be purchased as a single item. They are packaged with their Edu Voice suite of applications.

See <http://wimba.com/products/eduvoice.php>

Direct <http://wimba.com/tools/vdirect.php>

Wimba Voice Email <http://wimba.com/tools/vmail.php>

Pure Voice <http://www.cdmatech.com/solutions/products/purevoice.jsp>

Virtual Classrooms

Talking Communities <http://talk3.talkingcommunities.com/>

Another similar tool that offers competitive rates for leasing of their virtual classroom is Chatterbox. Compued is a local distributor for Australian customers.

See <http://www.compued.com.au/conference/>

HorizonLive <http://horizonlive.com/>

Illuminate <http://illuminate.com/>

See <http://www.tltgroup.org/CommunityConnectedness/SynchTools.htm> for a comparison of HorizonLive and Illuminate.

Simple examples of voice and graphic material in asynchronous mode using programs like Powerpoint and Impactica

<http://users.chariot.net.au/~michaelc/ppttests/collection.htm>

Audio Blogging

<http://www.audblog.com/> For a different style of blog using a Wimba voice board see the audio blog of the Networking 2003 conference at

<http://home.learningtimes.net/learningtimes?go=241723>

Voice Recognition Technologies

Read Donna Fluss's paper 'Speech Technology is Ready For Prime Time!' at

http://www.crmxchange.com/speech_technology/oct03.html

Also see liberated learning (<http://www.liberatedlearning.com>) a project that is trialling the use of new voice recognition software that allows a teacher's spoken word to be automatically converted to text, which can then be projected onto a large screen in the classroom.

Access to Guest Experts/Remote Lecturers

<http://www.geocities.com/aidenveh/michaelc>

and <http://streetlife.homestead.com/>

Attending Remote Meetings

See <http://home.learningtimes.net/learningtimes?go=262476> for an example of how this can work from the Flexible Learning Showcase Day, Adelaide, November 2003.

Attending Remote Conferences

See <http://home.learningtimes.net/learningtimes?go=251475> for an archive of a recent conference from Australia.

Oral Presentations

<http://www.faculty.rsu.edu/~clayton/lpalmer/palmer.html>

For a more in depth report of several voice based professional development sessions at conferences and workshops staff see

http://users.chariot.net.au/~michaelc/fll/events_debrief.htm

Other Synchronous Tools

Silicon Chalk <http://www.silicon-chalk.com>

Classroom of the Future

See <http://home.learningtimes.net/learningtimes?go=274114>

Effective audioconferencing strategies

http://www.dianehoward.com/Dr._H._teleconferencing_videoconferencing_streaming_webcasting.htm

Flexible Learning Leaders program <http://flexiblelearning.net.au/leaders/>

Webheads

<http://www.homestead.com/prosites-vstevens/files/efi/webheads.htm>

DEOS Enrolment:

<http://lists.psu.edu/cgi-bin/wa?A0=deos-l&O=D&T=0>

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