

Title: Introducing Wimba to Oscail Online Programmes

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Abstract

This paper reports on a pilot project that investigated the potential for providing synchronous web-based tutorial support for distance education students, and the evaluation of that pilot project. A key challenge for distance education providers is the provision of quality academic support to all students regardless of location. The proven, positive link between attendance at tutorials and academic achievement highlights this aspect of academic support as crucial to distance education student success. In response to student difficulties in attending tutorials and diminishing numbers of tutorial centres, it has become increasingly important to investigate alternative methods of providing tutorial support to distance education students. Following an evaluation of a number of web-based conferencing software, Dublin City University opted to use Wimba Classroom in providing live, virtual classrooms to students. The pilot project involved the adaption of the existing, synchronous, face-to-face tutorial support system, provided to distance education students on the Bachelor of Science in Information Technology (BSc in IT) degree programme from Oscail – DCU Distance Education, such that students attended live, virtual classrooms instead. A particular focus of this paper is the “Enterprise and Emerging Technologies” module of the BSc in IT programme which was specifically redesigned and rewritten for this pilot project. The most successful feature of this software was the archived versions of the live tutorials with 83% of students accessing the archives. The results of this project will have a significant impact on the future delivery of tutorial support, course delivery and assessment in Oscail – DCU Distance Education.

Introduction

This paper begins with a discussion of the rationale for and the implementation of introducing live, virtual classroom software across Oscail’s BSc in IT programme, with a significant focus on the “Enterprise and Emerging Technologies” module. This paper will describe the initial pilot project and the subsequent evaluation of this project, and will then move to present the key findings of the project and outline the likely impact of these findings on the future provision of academic support in Oscail’s BSc in IT programme. The presentation of the project’s findings will involve discussion of the experiences of students in using the live, virtual classroom software in a distance education setting. The paper will also discuss the future potential for the use of live, virtual classroom software across all programmes offered by Oscail and the also the benefits to various interested groups including traditional face-to-face students and providers of third level education.

Keegan (1996) defines distance education by comparing it to other forms of education. The five main distinguishing features of distance education being: the quasi-permanent separation of teacher and learner; the influence of an educational organization in planning, preparation, and provision of student support; the use of technical media; the provision of two-way communication; and the quasi-permanent absence of learning groups (Keegan, 1996). The final point here regarding the lack of learning groups, has been a topic of debate (Garrison & Shale, 1987 cited in Bernard et al., 2004;

Verduin & Clark, 1991, cited in Bernard et al., 2004) as it does not consider the use of technology to facilitate students learning in groups. Some distance education providers consider it appropriate to merely attempt as close a replication of the traditional classroom as is possible, but this disregards the fundamental principle of 'anytime, anyplace' learning sought after by most distance education providers. Rekkedal and Qvist-Eriksen (2003,) who consider online education as a subset of distance education, amend Keegan's third and fourth point to define online education as: the use of *computers and computer networks* to unite teacher and learners and carry the content of the course; and the provision of two-way communication *via computer networks* so that the student may benefit from or even initiate dialogue (this distinguishes it from other uses of technology in education). Many distance education systems can also be described as utilising blended learning or hybrid learning approaches, which is where a course blends online and face-to-face delivery. This usually means that substantial proportions of course content is delivered online, typically uses online discussions, and typically has a reduced number of face-to-face meetings (Allen & Seaman, 2010).

The nature of distance education generates particular concerns not encountered by on-campus educational providers, in particular communication issues (both academic and administration) and issues relating to course design and course delivery. In addition, distance education students often face challenges not encountered by, or at least encountered in different ways to, the traditional, on-campus student such as a feeling of isolation and communication with academic, technical and administrative support services. While some students find the self-directional, self paced nature of distance education advantageous, some students find this method of learning difficult (Tucker & Neely, 2010) One of the major challenges facing distance education, and which was a central focus in the pilot project, is balancing the provision of academic support, mainly through tutorials, with the reduction in tutorial attendance rates.

One of the main reasons students choose distance education is that, for various reasons, they cannot attend campus based courses. While distance education is ideal for these students, it is for this reason that many distance education students cannot attend face-to-face tutorials. Students can be supported outside of face-to-face tutorials through asynchronous means (geographically independent and time independent) or through online synchronous teaching (geographically independent but with temporal constraints). Asynchronous delivery system offers distance education providers the following advantages: flexibility, because students have access to materials anytime and anyplace; it allows learners time to reflect, think about ideas and check references; situated learning gives the student the opportunity to integrate ideas being discussed in the course with workers on the job; and cost-effective technology as asynchronous, text-based systems require very little bandwidth and low end computer access (Ellis, 1997).

While asynchronous collaborative technologies have dominated distance education in the past (Marjanovic, 1999), synchronous collaborative technologies that are simple and intuitive to use can now be effectively utilised to support student learning (Anderson, Fyvie, Koritko, McCarthy, Paz, Rizzuto, Tremblay, Sawyers, 2006). Several studies have indicated improvements in levels of active (online) participation, quality of discussion and in group dynamics when synchronous collaborative systems are used in teaching (Hrastinski, 2008; Marjanovic, 1999). Synchronous delivery systems offer us four advantages over other approaches: an ability to impact on student motivation where the focus is on the energy of the group; capitalise on the 'tele-presence' of the tutor as real time interaction occurs; the student's tutor, or fellow students, can provide good, instant feedback on ideas etc. presented; and regular meetings can be facilitated, encouraging students to keep up-to-date with the course materials (Ellis, 1997). Hrastinski (2008) also found that synchronous e-learning better supported increased motivation in students, and that there was decreased ambiguity in synchronous learning sessions because of the possibilities for immediate feedback. McAlister, Ravenscroft, and Scanlon (2004) also found that a synchronous online peer discussion system, of their design, led to improved argumentation and collaborative knowledge development among their

students in the UK Open University. They considered that social relationships, shared understanding, and clear identities were of particular importance in synchronous online interaction. Importantly, given that student retention and drop-out rates are a key concern for distance educators, it has been found that retention rates are lower and drop-out rates substantially higher in asynchronous distance education systems than where synchronous distance education systems are utilised (Bernard et al., 2004 cited in Murphy et al., 2011). It is easy to see why this is the case given that communication from, and interaction with, tutors influences a student's decision to remain in a programme or drop-out (Kember, 1989; Thompson, 1997), and that one of the main problems distance education students often report is a feeling of isolation (Wang, 2010). McBrien, Jones and Cheung (2009) recommended that, because distance education can lack interaction, students need to be provided with real-time interactions with academics and with other students. Synchronous communication provides the communication from tutors and helps combat feelings of isolation by providing interaction opportunities with tutors and fellow students. However, other research has found potential disadvantages to utilising synchronous, web-based teaching. Bernard et al.'s, (2004) meta-analysis found that synchronous approaches, where lecture-based, instructor-oriented approaches are used in virtual classrooms, can merely result in a poorer quality replication of classroom instruction. Unless more effective strategies are utilised (for example, constructivist teaching practices) are utilised synchronous approaches may not be a wise choice for distance education providers as it would not have the benefits of either face-to-face tutorials or asynchronous communication. There are also still questions over the effectiveness of "face-to-face" instruction conducted through a teleconferencing medium (Bernard et al., 2004).

Background of Oscail - Distance Education, Dublin City University

This section of the paper will give a brief overview of Oscail and the profile of Oscail students.

Overview of Oscail

Oscail has provided "second chance" education to thousands of adult learners over the last thirty years through the medium of distance education. Oscail aims to enable adult learners to achieve their educational goals through the study of undergraduate or postgraduate programmes without the need to regularly attend campus-based classes. Currently, Oscail offers a range of programmes in the areas of humanities, science, computing, management and sustainable development.

Oscail's academic support is provided through a combination of full-time and part-time staff located within their offices in Dublin and in various other locations across Ireland and Europe. In addition to the writers, editors, senior academics, subject monitors, internal examiners, external examiners, programme board members and the core academic team who organise the management and development of the programmes, the key academic support is provided by tutors. From the student point of view, tutors are the main element of (human) academic support provided by Oscail, and they are probably the most visible (human) layer of support.

Since its conception in 1982, Oscail has transformed from providing academic support solely through printed text and face-to-face tutorials to providing academic support using a variety of different tools including asynchronous discussions using online forums, online quizzes, online surveys, videos, chat and various online collaboration tools.

Before advancements in online technologies were made, the Irish market was the only source of students for Oscail. However, the communication and technological advances of emerging technology such as the Internet, specifically the availability of high quality broadband, have opened up the global market. With this opportunity comes increased competition between educational providers who find themselves competing, not only against institutions within their own countries, but against institutions across the world. This is a significant change for distance education providers

who until, recently, had little competition from education institution within their own country and from abroad.

In the model of distance education utilised by Oscail, face-to-face tutorial support is available in a number of study centres around Ireland but attendance is not compulsory for students. One of the key challenges Oscail faces is balancing academic support with the decline of student attendance at tutorial centres. In addition, the utilisation and development of emerging technologies has not only enabled educational providers to offer more online learning support but has also seen a surge in demand from students for these technologies. In a 2010 Oscail student experience survey, of Oscail's BSc. in IT programme, when students were asked to suggest improvements to the programme, they asked for more access to video tutorials and live, online teaching sessions.

Profile of the Oscail student

Oscail students range in age from 18 to 85 years with the majority of students being in the 30 to 50 age bracket. Typically, students choose to study with Oscail as it is location-independent and provides a flexibility which is not available to full-time or even part-time, campus-based students. This flexibility also allows students to obtain their educational goals while still maintaining employment and it allows them to combine their studies with the existing demands on their time such as family commitments. A small proportion of Oscail students reside abroad but the majority live in Ireland.

Rationale for introducing live, virtual classroom software to Oscail programmes

One of the challenges facing distance education students is accessing face-to-face interaction with academics and tutors. Often students require an immediate answer to a question which can be difficult in asynchronous communication. Traditionally, a solution to this lack of face-to-face communication has been the provision of a number of tutorials in various locations which caters for the majority of students, but it is a challenge to those living abroad or for those students who cannot travel to these centres. Until recently tutorials were provided at a number of study centres in various locations around Ireland; however the feasibility of providing numerous tutorial centres has been impacted on by decreasing student attendance at remote tutorial centres. There are various reasons for the decline in student attendance at tutorials including the cost of travel and accommodation, childcare and work commitments. Live, virtual classroom technology can provide a more effective solution to this challenge (Schullo, Barron, Kromrey, Venable, Hilbelink, Hohlfeld & Hogarty, 2005).

A priority for Oscail is the provision of high quality tutorial support for all Oscail students, regardless of where the student is located. Decreasing student attendance at face-to-face tutorials has financial implications for distance education providers, where those study centres continue to exist without a viable number of students to justify their existence, and also pedagogical implications for students who are not accruing the educational benefits they would if they were attending tutorials. Therefore, for both practical and pedagogical reasons, Oscail has explored the potential uses of live, virtual classroom software. The recent developments in online technologies and in particular access to broadband has allowed Oscail to begin to change the way in which they provide learning support to its students by providing real-time virtual tutorials.

Following a review of various live, virtual classroom software packages, Wimba Collaboration Suite was adopted across DCU. Wimba Collaboration Suite is a suite of products that replicates the classroom environment. Its products include Wimba Classroom, Wimba Pronto and Wimba Voice. The main focus of this paper is Wimba Classroom, which consists of features such as audio, video, chat, whiteboard and application sharing. It is a web based live classroom tool which allows participants to interact synchronously mimicking the essential aspects of a traditional face-to-face classroom. It includes features such as audio, video, chat, whiteboard and application sharing.

An essential aspect of distance education is the design, development and delivery of effective distance education course materials and resources. Oscail students are provided with specifically written self-instructional course texts (containing self assessment questions and answers), which can be seen as taking the place of the traditional lecture. These texts are designed and developed by subject specific academics and Oscail's quality assurance policy requires that these texts be reviewed annually by subject specific academics which results in a cycle of editing, updating and re-writing. Academic support is, currently, provided mainly through face-to-face tutorials and online support conducted through the use of forums in the online virtual learning environment (Moodle) and through email. The ability to provide real-time lectures through live virtual classroom software will have a significant impact on the future development of Oscail course materials.

The Pilot Project

Prior to the commencement of the 2010/2011 academic year a number of live virtual classroom software packages were evaluated within the University before the decision was taken to use Wimba Classroom.

One of the key considerations for the introduction of any new software is the need to support and train relevant staff and students. Firstly, key members of DCU/Oscail staff were trained on the use and functionality of the Wimba Classroom software. Wimba Classroom was itself used as the medium through which this training was delivered. Oscail is in a unique position in that its tutors come from a range of external businesses and third level institutions rather than being full-time DCU staff, so conducting the training using Wimba did not require the tutors to travel to Dublin for the training sessions. It also allowed us to draw on their wide range of existing experience with similar technology. Internal Oscail staff developed a specific training plan, for the tutors, in the effective use of Wimba Classroom. The tutors involved in the modules selected for the pilot project were then trained prior to the commencement of the academic year. In the academic year 2010-2011 Wimba Classroom was introduced to over 50% of the modules in the Bachelor of Science in Information Technology degree programme.

A major element in the introduction of Wimba Classroom to Oscail programmes was the development of a new, final year module on a BSc. in IT by distance programme called Enterprise and Emerging Technologies. During this module students undertake self-directed and group research in a given set of emerging technologies. The students then create a business idea based around one of these emerging technologies and take their idea through all stages of enterprise planning towards a final business plan. As students develop their ideas, they present discuss drafts of each aspect of their plan (e.g. of financial projections, legal and employment issues, marketing, revenue streams etc.) to their tutor and to each other for peer critique. Students are continually assessed during the year in an intensive way and present a final business plan at the end of the year which counts towards a significant portion of overall credit for the module (there is no examination). The teaching of this module consisted of a blended learning approach comprising written course materials, structured course work in the virtual learning environment and tutorial support in Wimba Classroom. Students had one face-to-face introductory session at the beginning of the academic year, with all other tutorial support being provided through Wimba Classroom and the online virtual learning environment. On the other modules chosen for the pilot project, Wimba Classroom was introduced alongside face-to-face tutorials.

Before commencing their studies, students were informed of the technical specifications, software and hardware requirements for using Wimba Classroom. They were also advised to run the Wimba setup wizard prior to engaging with the Wimba Classroom sessions, in order to deal with any initial technical difficulties ahead of time. Technical support was provided at each session by the Wimba technical team.

Following the completion of the pilot project, at the end of the 2010/2011 academic year, a student evaluation survey was conducted to obtain detailed feedback on the student experience of using Wimba Classroom. The results from this evaluation survey will be presented in the next section.

Findings from the evaluation of the pilot project

Data was collected from 62 of the 159 students who were invited to complete the student evaluation survey (response rate was 39%).

Wimba Classroom tutorials were a non-compulsory component of the modules however 66% (41 students) of the respondents reported that they had taken part in at least one Wimba Classroom session during the pilot project.

Students reported their proficiency in the use of computers and technology as being at a high average likert score of 1.46 (1 = excellent; 5 = poor). In addition to Wimba Classroom there are various other software tools which facilitate synchronous online discussions such as Skype, Elluminate and Adobe Connect. 44% (18 of the 41 students who used Wimba Classroom) of respondents had used something like Wimba Classroom previously. This competency reflects the particular nature of these students many of whom already work in IT or a related field, and are studying part time for a degree to bolster their current career.

The primary goal for the use of technology in the educational environment is to enhance student learning, it should not create an additional barrier. In this project 48% (30 students) of students did not experience any problem accessing or connecting to Wimba Classroom. However, 18% (11 students) did experience connection problems. Interestingly, all of the students who experienced connection issues had run the Wimba Classroom setup wizard prior to the Wimba Classroom session. The main connectivity issues that emerged included internet connection problems, bandwidth and issues with a java plug-in.

When asked if they experienced any issues with audio or video 44% (18 students) reported that they did not experience any issues while 56% (23 students) did. The main audio/video issues that arose concerned bad quality of sound due to bandwidth connection and/or poor headset quality.

As mentioned above, Wimba Classroom has a number of communication tools which allow students to communicate with the tutor and their fellow students, such as the talk (students speak into their microphone/headset) and text (students type into a text chat box) features. Students did not display a strong preference for either option, with 49% (20 students) opting for the talk feature and 51% (21 students) favouring the text feature.

A key to the success of software in the educational environment is the perceived ease of use of the technology. In this case students rated the usability of all features of the Wimba Classroom interface with a likert score (1 = very easy; 5 = very difficult) of 1.64 (talk feature), 1.82 (text feature), 1.81 (yes/no feature) and 1.86 (hand raising feature). Although, the high scores for technical competence should be borne in mind.

One of the advantages of using Wimba Classroom is the ability to record and archive sessions for later viewing. 83% (34 students) accessed the archived sessions for their modules at least once.

In general students reported a positive experience of using Wimba Classroom with a likert score of 2.03 (1 = excellent; 5 = poor). Of the students that took part in Wimba Classroom sessions, 61% (25 students) said they would prefer face-to-face tutorials to live, online classroom sessions.

An interesting finding is that students were split almost evenly when asked if they were forced to choose exclusively between face-to-face and live online (50% face-to-face, 47% online, 3% no opinion).

When students who had participated in live, online classroom sessions were asked if they had any advice for students who have not yet used Wimba Classroom, the predominant response related to running the Wimba Classroom setup wizard ahead of time, in order to alleviate any potential issues which may arise. Below are some further comments from students:

'Try it. Very easy to set up and use'. (Student X)

'Go for it, its the future, saves you going out in traffic, bad weather etc...in my opinion it's definitely the way forward.' (Student Y)

'Make sure you run through the checklist long before the session is due to start, to make sure you've ironed out any technical issues'. (Student Z)

Discussion of findings and future plans

The findings reported above indicate that the live, virtual classroom technology was well received by the students involved in the pilot project, as they indicated that it was a reasonably simple to use. While approximately half of the students involved in the pilot project would still choose face-to-face tutorials over virtual tutorials if they had the choice, this technology is being introduced because many students do not have the option to attend face-to-face tutorials. The finding that students are divided in their preference for online versus face-to-face is similar to findings of adopters of virtual classrooms elsewhere such as Ng (2007) and Schulsman et al. (2009) who reported that not all students were eager at first to change their existing mode, though others were.

Due to the successful integration, as shown above, of live, virtual classroom software to the Bachelor of Science in Information Technology programme, Oscail plan on incorporating it into the remaining undergraduate and postgraduate programmes. The next phase of the project which will commence in August 2011 which will involve the tutors in Oscail's Humanities programme being trained in the use of live virtual classroom software, followed by training of the tutors in the postgraduate programmes.

The success of live virtual classroom software will impact on the future provision of face-to-face tutorials in study centres located outside of Dublin. The number of centres has declined in recent years and this trend is set to continue. However, live, virtual classrooms may provide a solution to this issue. It is planned that, in addition to the existing tutorial centres, Oscail will offer "virtual centres" to its students in 2011/2012. This will allow students to opt for live virtual tutorials rather than face-to-face tutorials.

During the pilot project Blackboard acquired Wimba and another web conferencing tool called Elluminate, and has created a new product called Blackboard Collaborate. It is expected that DCU will move to this new software in time for the 2011/2012 academic year. The response of a cohort of DCU staff to a brief trial of the new Blackboard Collaborate software was very positive with reports that it appears to improve the appearance of the previous interface. This enhancement of the usability of the software should impact positively on the student and tutor experience of live virtual tutorials.

Live virtual classroom software is going to impact on the future design of course materials in Oscail. A combination of advances in technologies, integration of software systems, wider access to broadband and falling costs of hardware and software will mould the future of distance education course design and delivery. Prior to these technological and communication advances distance

education in Oscail took the form of static printed course materials with students having to travel to access academic support and resources. The Oscail course design and delivery team see the direction of pedagogically sound course teaching materials and resources moving away from static delivery to a much more interactive and engaging approach. Assessment is a major component of teaching and learning and the use of live virtual classroom software will allow for more dynamic and interactive assessment methods.

Conclusion

The pilot project investigated the use of live virtual classroom software in distance education as a tool to support student learning. The results of this research have shown that live virtual classroom software is relatively easy to use and generates a positive user experience. While a small number of students reported difficulties with the audio, generally there were no major issues with the functionality of the technology.

Additionally, this research has shown that the archived sessions of the live tutorials were popular with students. It increases the opportunity for wider access to tutorial support for those who are unable to participate in face-to-face or live virtual classroom tutorials at the designated times thus preserving the flexibility which is intrinsic to distance education. The ability to record and store tutorial sessions provides an additional teaching aid that was previously unavailable to Oscail students.

A further outcome of this investigation is the potential for an increased world-wide student base as this software positions the University in a situation where it can offer greater support to students, as it can reach students regardless of geographic location. This software optimises and modernises the traditional advantages to distance education.

While in general the result of this research has a huge impact on distance education providers, it also opens up possibilities for traditional campus-based courses to be converted for online delivery. In challenging times, where there is increased demand on University staff and a reduction in resources, a concern has been the amount of resources required to convert a campus-based course for online delivery. Live virtual classroom software can allow for a much easier conversion from campus-based to online. No longer will there be a need to produce substantial course texts, the production of which can take many months, but instead academics can utilise the various synchronous and asynchronous online tools at their disposal to create a flexible network of learning materials and student support mechanisms.

Distance education has continually transformed and responded to the changing needs of the educational environment. Through the development of emerging technologies and through continual research and development distance education in the 21st century has made huge advances. Continual advances and research will provide the potential to tackle the future challenges of lifelong learning.

References

Allen, Elaine & Seaman, Jeff (2010) *Class Differences: Online Education in the United States*. Babson Survey Research Group: The Sloan Consortium, United States of America.

Anderson, L., Fyvie, B., Koritko, B., McCarthy, K., Murillo Paz, S., Rizzuto, M., Tremblay, R., & Sawyers, U. (2006). Best practices in synchronous conferencing moderation. *The International Review of Research in Open and Distance Learning*, 7(1).

Bernard, R. M., Abram, P. C., Lou, Y., Borokhovski, E., Wade, A., Wozney, L. et al (2004) How does distance education compare with classroom instruction? A meta-analysis of the empirical literature. *Review of Education Research*, (74), pp. 379-439.

Ellis, B. (1997). Virtual Classroom Technologies for Distance Education: The Case for On-line Synchronous Delivery. *Distance Education Technology and Consulting* October 1997.

Keegan, Desmond, (1996) 3rd Edition *Foundations of Distance Education*. Routledge, London.

Kember, David (1989) A Longitudinal-Process Model of Drop-Out from Distance education in *The Journal of Higher Education*, (60:3), pp. 278-301.

Hrastinski, S. (2008). Participating in synchronous online education. Unpublished Doctoral Thesis. Department of Informatics School of Economics and Management, Lund University.

Loch, B., Reushle, S., Jayne, N. & Rowe, S. (2010). Adopting synchronous audiographic web conferencing: a tale from two regional universities in Australia. In S. Mukerji & P. Tripathi (eds). *Cases on technology enhanced learning through collaborative opportunities*. New York: Information Science

Marjanovic, O. (1999). Learning and teaching in a synchronous collaborative environment. *Journal of Computer Assisted Learning*, (15) pp. 129-138.

McAlister, S., Ravenscroft, A., & Scanlon, E. (2004). Combining interaction and context design to support collaborative argumentation using a tool for synchronous CMC. *Journal of Computer Assisted Learning*, (20), 194-204.

McBrien, J.L., Jones, P., & Cheug, R. (2009). Virtual spaces: employing a synchronous online classroom to facilitate student engagement in online learning. *International Review of Research in Open and Distance Learning*, (10:3), pp. 1-17.

Murphy, Elizabeth, Rodriguez-Manzanares, Maria & Barbour, Michael (2011) Asynchronous and synchronous online teaching: Perspectives of Canadian high school distance education teachers in *British Journal of Educational Technology* (42:4), pp. 583-591.

Ng, K. C. (2007). Replacing face-to-face tutorials by synchronous online technologies: Challenges and pedagogical implications. *International Review of Research in Open and Distance Learning*. (8:1)

Rekkedal Torstein & Qvist-Eriksen, Svein (2003) *Internet Based E-learning, Pedagogy and Support Systems*. Norway.

Schullo, S., Barron, A. E., Kromrey, J. D., Venable, M., Hilbelink, A., Hohlfeld, T. & Hogarty, K. (2005) *Enhancing Online Courses with Synchronous Software: An Analysis of Strategies and Interactions*. Canada.

Schlussmans, K., Giesbertz, W., Rusman, E., & Spoelstra, H. (2009). The introduction of a virtual classroom instrument at the Open University of the Netherlands. Paper presented at the 23rd ICDE World Conference on Open Learning and Distance education. June, 7-10, 2009, Maastricht, The Netherlands

Thompson, E (1997). Distance education drop-out: What can we do? In Pospisil, R. and Willcoxson, L. (Eds), *Learning Through Teaching*, p324-332. Proceedings of the 6th Annual Teaching Learning Forum, Murdoch University, February 1997. Perth: Murdoch University.

Tucker, J.P. & Neely, P.W. (2010). Using web conferencing and the Socratic method to facilitate distance learning. *International Journal of Instructional Technology and Distance Learning*; (7:6), pp. 15-22.

Wang, Harris (2010) *Towards a Real Virtual Classroom*. Canada.