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Changing Faces of Open and Distance Learning in Asia

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It is no incident that IRRODL begins the year of 2007 with this regional focus edition on “Changing Faces of Open and Distance Learning in Asia.” Over the recent years, there has been tremendous growth and diversity in open and distance learning (ODL) in Asia. With over 56 percent of the global population, Asia has over 70 universities that are dedicated to open access to education, including seven out of 11 of the world's mega universities (universities with over 100,000 active students in degree-level courses) serving six million active students all together (Daniel, 1996). Quite a few distance teaching universities or programs such as the *Bangladeshi Open University*, the *Hanoi Open University*, the *Open University Malaysia*, and the *Open and Distance Learning Program* in Singapore, have been established since the 1990s and now provide tertiary level education to those seeking continuing education opportunities. Virtual universities are growing fast and, with 17 virtual universities in Korea alone! Many conventional, campus-based universities have started to offer e-Learning programs as well. For example, 67 e-Colleges have been established within conventional research universities in China.

Moreover, cross-border education – especially via e-Learning – is becoming a reality today throughout the Asian region. Asia has been a key target market of many Australian universities, the *UK Open University* – institutions that not only seek to enroll Asian students, but franchises and accredits Asian providers. U.S. private providers such as *University of Phoenix Online*, *Cardean University*, *EducAsia*, *Apollo International*, and *UNext* are also in operation in addition to *Universitas 21 Global*, a consortium of 21 research universities including *Fudan*, *Peking* and *Shanghai Jao Tong Universities* in China, *National University of Singapore*, *University of Hong Kong*, and *Korea University in Asia*.

Cross-border traffic is not all one-way, however. South Asia's *Indira Gandhi National Open University* delivers its programs into Abu Dhabi, Dubai, Sharjah, Doha, Kuwait and Sultanate of Oman, Maldives, Mauritius and Seychelles, Vietnam (in collaboration with *Hanoi Open University*), Myanmar (in collaboration with *University of Distance Education*), and Singapore. The *UK Open University* also licenses its courses/ course materials for use by other institutions in the region. Hong Kong, Indian and Malaysian ODL providers are also exporting programs to countries such as Bangladesh, China, Indonesia, and Sri Lanka.

With the increasing number of student enrollments in ODL institutions and the growth of cross-border ODL, especially by for-profit providers in Asia, the issue of quality and quality assurance

(QA) has become more pressing than ever before. According to a recent survey (Jung, 2005) a quality culture has been emerging, if not fully integrated, in the ODL institutions investigated. All mega universities, including seven in Asia, have developed and implemented QA standards and procedures in key areas of distance education activities, and at least three mega universities in Asia surveyed have institutionalized a central QA unit and sought the development of a more systematic and coherent quality culture. Another indicator for the emergence of a quality culture is capacity-building efforts made by the institutions. In their pursuit of quality improvement, at least half of the mega universities now provide continuous staff development opportunities to enhance the knowledge and skills of their academic and administrative staff. Moreover, most of the institutions have been seeking to obtain national recognition as high quality DE providers. Some have gone beyond the national level accreditation and recognition and have pursued international recognition for their services, such as ISO certification. The survey also shows that there exists a variety of QA systems of distance education even though the globalization and competitiveness of higher education and the development of information and communication technologies (ICT) have brought distance teaching universities closer together in terms of developing a common quality culture. It also reveals that in quite a few cases, QA policies are established only at the unit level or only for certain aspects of ODL activities, and thus not firmly integrated into the larger university policy and performance framework.

ICT is a major contributor to the dramatic transformation of ODL in Asia. According to a report published by the International Telecommunication Union (2004), in the past few years growth rates for fixed land lines, mobile subscribers, and Internet users in Asia has surpassed the single digit growth rates seen in other regions. The number of Internet users in Asia as of 2006 is approximately 379 million, 35 percent usage of the world. Further, four Asia countries (China, Japan, India, and Korea) are among the top 10 countries with highest number of Internet users. With the development of ICT infrastructure in the region, ODL institutions in Asia have adopted ICT to support supplementary modes of instruction and, more importantly, as a means of improving student services and providing interactions. As indicated above, ODL institutions and conventional universities have started totally online courses or programs and new virtual universities have been established. There are also evidence that ICT has brought new educational opportunities to under-served students in many developing countries such as Cambodia and Bhutan to name just two. Whereas advanced ICT offers options to both expand educational opportunities and improve upon quality, it poses many new challenges as manifest in the 'digital divide.' In Asia, Internet technologies show very high concentrations of 'inequality,' ranging from nearly 0 percent Internet penetration, to over 80 percent connectivity to the Internet. Even though several international organizations and agencies have been collaborating with developing countries in Asia to improve ICT infrastructure and initiate ICT-based ODL projects, the reality is that ICT-based ODL in Asia today is not narrowing the digital divide substantially. It is not narrowing the gap between those with knowledge and technology and those who lack access and hence, have less opportunity.

All these features have contributed to the development of ODL and shaped current ODL systems in Asia. In recent years, more and more Asian countries and institutions see ODL, especially e-Learning, as an alternative mode of delivery to widen access to education, satisfy continuing educational needs of adults, expand trained workforce, and/ or train teachers to improve the quality of schooling. Pedagogical changes have been observed in ODL. For example, one-way broadcast-based or correspondence courses have been replaced by two-way interactive courses, problem-based, case-based, and/ or resource-based learning. Personalized learning and support services have been introduced in several ODL institutions as well. In addition, conventional universities have been embracing innovative ODL programs and e-Learning. UNESCO's Asia

Pacific Open and Distance Learning Knowledge Base (see <http://asiapacific-odl.oum.edu.my>) introduces some of these pedagogical changes in ODL in Asia. Yet, most ODL institutions are not making the changes necessary to maximize pedagogical benefits of such advanced technologies that promise to bring a more interactive, learner-oriented model to students' learning experiences.

This Regional Focus Issue on Asia

The research articles and case studies presented in this theme issue report, analyze, and evaluate recent ODL initiatives and experiments at the national and institutional levels. In this regional-focus issue, there are four Scholarly Research papers, three Cases, and one Technical Note report. For this issue, I opted to further define IRRODL's Main Section papers as Scholarly Research, Case Studies, and Technical Notes because these papers all have been peer reviewed and impart valuable information to IRRODL's readership.

The first three articles in the Scholarly Research section discuss the possibilities and promises of different types of ODL and identify a number of policy issues, namely, accessibility, changes in institutional cultures and academics' roles, costs, quality assurance, and supporting systems. The fourth article in this section reports on an empirical study on the use of a synchronous technology in the replacement of face-to-face tutorials in an ODL institution.

The first article by Frank Rennie and Robin Mason begins by introducing the higher education system in Bhutan and Nepal within the context of distributed learning development. The authors examine the research and development work currently being done at universities in Bhutan and Nepal, in the design of distributed learning systems across dispersed campuses. This paper also highlights these institutions' future need to introduce elements of resource-based and student-centered learning for campus students to promote flexible learning. Among others, lack of infrastructure and resistant academic culture are identified as two main barriers to the design of distributed learning systems in both countries, where paradoxically, education is viewed as a high priority and as "as a way out of the poverty trap" (p. 3).

Next we move to Korea, the first country ranked worldwide in terms of ICT opportunity, infrastructure, and utilization. The paper by Junghoon Leem and Byungro Lim examines e-Learning in Korean higher education as a means to enhance Korea's academic competitiveness. These authors report on a survey conducted with 201 universities. It shows the convergence of traditional campus-based higher education with distance education, and the blurring phenomenon between the two modes. In Korea, 85 percent of the universities and colleges investigated have implemented e-Learning and are equipped with technical infrastructure and operational supports. This paper points out, however, major challenges in e-Learning, specifically that there is insufficient funding to provide pedagogical supports to both teachers and students, and a lack of quality assurance policies to support e-Learning.

In the next article, we turn to the Philippines, where the ODL experience has been accumulated and ICT infrastructure is moderately established. In the article, Melinda dela Pena Bandalaria explains the evolution of ODL in Philippines in terms of four phases and discusses a wide range of roles that ICT can play to promote and improve ODL practices. The author also examines important factors affecting ICT integration in ODL. Among those factors are geographical locations, lack of knowledge and skills to use ICT, and financial constraints. Pedagogical and social concerns are also highlighted. The author also argues that the increasing use of ICT in ODL can impact not only the teaching-learning environment, but also the development of new

culture, new concepts and understanding, and new aspirations to both the individuals and organizations. The paper concludes with lessons learned from the Philippines' experience to provide ODL strategies for other developing countries.

The paper by Tian Belawati and Amin Zuhairi focuses on the emerging culture of quality and the development of a quality assurance system in the context of Indonesian ODL. The authors present an example of *Universitas Terbuka* (UT) that effectively addresses quality concerns by implementing and harnessing quality assurance as an innovative strategy for continuous improvement in a distance higher education institution in Indonesia. The authors offer an in-depth review of the QA framework and job manuals, strategies for staff involvement in the QA process, internal and external assessment, and benchmarking. The authors conclude that "quality assurance must be developed as institutional policy and strategy for continuous improvement" (p.1).

The paper by Kwok Chi Ng provides a concrete example of institutional efforts to improve the quality of e-Learning via a synchronous technology called *Interwise* at the Open University Hong Kong. Ng discusses the pedagogical implications of replacing face-to-face tutorial sessions with synchronous online tutorials, and the challenges in managing real-time conferences for ODL. In conclusion, Ng highlights the needs for integrating student-student interactions, providing pedagogical and technical supports to tutors, and promoting social dimension of learning.

Case Studies and Technical Report

The Case Studies sections of this regional-focus issue include one analytical report on the current status of e-training in Korea, three evaluation reports of e-Learning experiments in Cambodian Community Information Centers, two universities in Japan, and at the *Jiangsu Radio and Television University* in China. We conclude with one Technical Report examining the emergence of open-source software in China.

Cheolil Lim examines the current status of Korea's corporate e-Learning and suggests new policy directions for improvement. The author first analyses the rapid growth of the corporate e-Learning in Korea over the past six years due to government initiatives. Explored are issues such as lack of diverse e-Learning types for authentic practices in workplaces, inadequate quality assurance mechanisms, and uneven e-training adoption rates across companies. The author concludes with suggestions for developing more dynamic e-Learning programs and providing opportunities for the disadvantaged employees of small- and mid-sized companies.

The paper by Buenafe R. Abdon, Seishi Ninomiya, and Robert T. Raab report on an e-Learning project in Cambodia, which was conducted by selected Community Information Centers in Cambodia in collaboration with several international and regional organizations. The main objectives of this e-Learning project were to determine if e-Learning could address the challenges associated with reaching students outside of the capital of Cambodia (Phon Penh) and to see if e-Learning could work given the low level of familiarity of students with technology. This project found that e-Learning was an effective alternative for delivering tertiary education, especially to underserved students in Cambodia's provinces. The authors, however, point out that lowered cost of Internet access and increased penetration of the Internet in underserved areas of Cambodia remains necessary for implementing e-Learning as a viable approach for reaching underserved learners living in the country's provinces.

In our next paper, Keiichi Kubota and Kiyoshi Fujikawa describe a distance teaching experiment between two universities in Japan adopting online technologies. Described are students'

evaluations and the authors' own observations, which reveal that this synchronous distance teaching project helped two universities share an introductory finance course in an efficient and effective manner. Based on their experiences, these authors encourage instructors to prepare well-informed and well-designed multimedia materials in advance and incorporate tools that promote interaction. The authors conclude with suggestions to combine technology-based teaching with classroom teaching, in order to promote interaction among students and instructors.

Then we move to a case of *Jiangsu Radio and Television University* (JRTVU) in China. In this case study, Zhang Xiangyang and Hung Shu-chiu report on the evaluation result of the pilot multimedia in-service teacher training program in JRTVU. This program, carried out by JRTVU in collaboration with China's *Central Radio and Television University*, the *British Council*, and *Beijing Foreign Studies University*, focused on upgrading teachers' qualification and developing their pedagogic and linguistic competence in English education through integration of the low- and high-technologies. Findings reported indicate that the program helped lower the drop-out rate, increase learner satisfaction, improve learning outcomes, and promote quality of learner supports. It is also reported that the trainees have become more independent learners and have applied learner-centered and communicative task-oriented language teaching approaches in their instruction. The authors then suggest some possibilities for future improvement.

Finally I would like to draw your attention to the paper on the emergence of open-source software in China, written by Guohua Pan and Curtis J. Bonk. The paper begins by introducing open-source software movements initiated by central and local Chinese governments and analyzing the development model of *Red Flag Linux*, the most successful open source software initiative in China. It is highlighted in the paper that unlike other countries, in China open-source software initiatives are strongly supported by different levels of governments, although the needs of educational institutions are not often reflected in these initiatives. In its conclusion, the paper discusses the potential of open-source software as a means to promote more flexible, learner-centered ODL in China.

Careful reading of these papers and reports will reveal that, in general, ODL in Asia is playing an increasingly significant role in national higher education systems and in the private sector. Moreover, they underscore that ODL is clearly becoming an important policy choice for most countries throughout Asia and beyond. ODL is beginning to offer more flexible and interactive learning experiences through advanced ICT, even in less developed countries. It is also notable that various issues related to quality assurance are being raised and some concrete measures are being undertaken in several ODL cases. I hope all these papers will help you develop a better understanding of changing natures of ODL in Asia.

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The Development of Distributed Learning Techniques in Bhutan and Nepal

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Abstract

This paper discusses research and development work currently being conducted with universities in Bhutan and Nepal to design appropriate systems for distance and distributed learning courses among a network of campus sites. Although working from a high level of awareness of pedagogic skills, staff in the region face two significant impediments in the adoption of a more open culture of learning. Firstly, Internet access is improving rapidly, but is still generally too weak and inconsistent to allow any reliance on net-based learning solutions. Secondly, the academic culture is resistant to the recognition of the value of open-learning degrees, with subsequent difficulties in re-designing course materials for a more educationally flexible, student-centred learning environment. Some current pilot initiatives in distributed learning are described. Methods for addressing these two impediments are discussed.

Keywords: Distributed education; Nepal; Bhutan; pedagogy

Introduction

The term 'distributed education' is used in a wide variety of ways to refer to quite different educational practices. The University of the Highlands and Islands Millennium Institute (UHI) is distributed in the sense that it is composed of 15 colleges spread over a very wide geographical area of northern Scotland. Various technologies are used to deliver courses to students so that they do not need to re-locate in order to access higher education. The British Open University can be called distributed in the sense that it too uses technology to deliver courses to students spread over the whole UK and beyond. Online and face-to-face tutorials are held to support students in their study of largely print-based course materials.

Blended learning is another term that is often used to refer to practices similar to distributed education. Blended learning usually implies a combination of online and face-to-face teaching (Sharp, Benfield, Roberts, & Francis 2006). Distributed education usually implies a separation either in time or space between the teacher and the taught. In any case, what both concepts are addressing is the need for greater flexibility and access to higher education than the traditional campus experience affords (Mason & Rennie, 2006).

Both Bhutan and Nepal have a higher education system that could be called distributed, although they differ in the nature of the distributed components. Travel is extremely difficult in both countries due to the mountainous terrain and the lack of infrastructure. Access to secondary education, much less higher education, is a major problem and only a small percentage of the total populations attend university. As the Vice Chancellor of the Royal University of Bhutan (RUB) has commented, a distributed education system suits the geographical situation of Bhutan (Dukpa, 2004).

In this paper we will outline the different distributed systems in Bhutan and Nepal, and describe current uses of technology to provide distributed education. Finally, we will suggest possible options for increasing both access and flexibility in the future.

Context

Nepal and Bhutan are both small land-locked Asian countries in the foothills of the Himalayas, with India and China as near neighbours. Both are fiercely independent and proud of their traditions and history. Education is a high priority for both as a way out of the poverty trap.

Bhutan

The Royal University of Bhutan is the only university in Bhutan, having been established in 2003 from a network of nine specialist institutes scattered around the country. It is therefore, distributed in somewhat the same way as UHI, though students of RUB have to re-locate to the college which teaches their chosen subject, whereas students of UHI can study their chosen subject from their local college using various forms of online technology.

There is a wide diversity in the educational development of the RUB institutes, and in the faculties and departments across the university. The National Institute of Traditional Medicine teaches almost entirely through indigenous languages and is based on ancient Tibetan concepts of medicine, whereas the National Institute of Education has many staff members with second degrees from Occidental universities and has adopted many advanced pedagogical approaches that would be familiar to Western academics. English is the language of education from primary school upwards, and is the sole language of higher education. Academic partner colleges in the network specialise in a specific curriculum area, so for example there is an Institute of Management, an Institute of Technology and a Natural Resource Training Institute, all located in different parts of the country. As might be expected in a newly established university in an emergent country, there are many curriculum areas that cannot be addressed, particularly at more advanced levels of study and in areas of high cost resources. A small number of students travel abroad, especially to India, for their undergraduate training. The enthusiasm and commitment to education is high among both staff and students, with a high retention rate and high progression into employment for completing students.

The Internet structure is rudimentary, particularly outwith the capital, and is not consistently reliable enough to permit even a moderate level of technological networking beyond email exchanges. Telephone networks are heavily dependent upon mobile phones, and the radio and television broadcasts have sporadic coverage across the country. Although education is highly valued in Bhutanese society, there are a number of cultural peculiarities that are relevant to the context of the current paper. Firstly, distance or online learning is not common practice in any subject area, and is frequently regarded with suspicion by academic staff, employers, and students

alike. This should come as no surprise as this was a common attitude in the West until about twenty years ago (and some may say is still prevalent in subject-specific areas). Secondly, the concept of 'critical thinking' so highly regarded by Western academics, is anathema to the traditional Buddhist educational system, and this actively works against the idea of student-centred learning that values curiosity, rationality, and creative approaches to learning. This contrast between 'traditional' and 'modern' educational thinking is carefully explored by Phuntsho (2000) and we will return to this later. The challenge, therefore, is to continue to nurture a progressive, open educational system in Bhutan, but to do so with respect to the prevalent culture of society, and within the limits of technology that is appropriate to the tasks in hand.

Nepal

The situation is somewhat different in Nepal, but this difference is only superficial and produces many similar effects. Tribhuvan University is the largest of the six universities in Nepal, accounting for about 95 per cent of the student body. The university is largely based in Kathmandu, although in recent years there has been a rapid growth to include a large number of 'affiliated colleges' some of which are very small and specialised. The majority of these colleges offer management, humanities and/ or education programmes and only a few offer science degrees. The curriculum for all programmes is defined by the central faculty in Kathmandu and delivered primarily by lectures at the different colleges. This is, thus, a different form of distributed education from the practice in Bhutan.

Around 89 per cent of the population of Nepal live in villages, and as one of the poorest economies in Asia, there is a large difference in the standards of living between the urban areas and the rest of the country. Undoubtedly this is a major contributor to the fact that only 2 per cent of the total population receive higher education, and even from this there is a high drop-out rate, as much as 50 per cent (Singh, 2006) largely due to financial constraints. There are further difficulties of educational provision in the inclusion of women, and for different castes/ ethnic minorities (Singh, 2006) and also with the social unrest in the rural areas due to ten years of insurrection by Maoist guerrillas.

The curriculum at Tribhuvan University is diverse, and some subject areas, such as engineering, medicine, and education command parity with the best in SE Asia. The teaching methods tend to be very conservative, and there is an emphasis on memorisation, exams, and courses that are not resource intensive (possibly due to ongoing funding difficulties between the university and the state)(Wagley, 2006). Major problem areas are the relevance of completed degrees to employers, the issue of equity/ equality of access to higher education by different sections of society, and the poor retention rate of students (Wagley, 2006). There has been some involvement with distance education techniques in Nepal, largely to do with the training of teachers in rural areas (Thapaliya, 2006) using radio, cassette tapes, and printed materials, but this pilot has been very limited. As with Bhutan, the value of open education degrees is widely suspect by most academics, administrators, and employers (and therefore students too) although the university has recently announced its intention to recognise a second degree obtained by distance/ open learning so long as the first degree is from a 'traditional' route. There is an understanding of the need to move towards the use of distance education methods, and a general commitment to this from the University and from government, but as yet this is solely rhetorical. Internet access is poor to non-existent outwith major urban areas although there is a rapid increase in mobile phone users, and Nepal Telecom seems poised on the cusp of a campaign to roll out wireless and satellite broadband connection, subject to continued funding.

Current Experiences

Although distributed learning is in its infancy in both Bhutan and Nepal, there have been a number of pilot initiatives to experiment with more flexible styles of course delivery. The Nepalese have expressed an interest, in principle, to create an Open University of Nepal, based upon existing academic strengths in key areas. The Royal University of Bhutan, on the other hand, is a much newer institution and is conducting a more cautious appraisal of the role of technology to support their form of distributed learning within the university network. In both countries there is a strong tradition of face-to-face teaching, usually with much higher tutor-student contact hours than would be normal in a western university. There has been a reliance on lectures, in particular, as a teaching medium, a method that has been compounded for both staff and students due to the relative scarcity of sufficient, modern books, journals, and technological assistance through video, DVD, and the Internet.

Teacher education has been a focus of efforts to increase access and flexibility at both universities. In Nepal, the aim has been to provide training for those teachers who have no teaching qualifications, and to offer professional updating for those who wish to continue their studies whilst working. Tribhuvan University started a one year distance-taught B.Ed programme in 2001 using print materials plus some face-to-face workshops. The National Centre for Educational Development is a small flexible education unit within the university that has recent expertise in producing course materials. Instructional programmes have combined radio broadcasts, cassette tapes, and print resources to assist the continued professional development of rural primary teachers. This "Interactive Radio Instruction" (IRI) has enabled some rural teachers to engage effectively with CPD for the first time, and to reduce the demands on attendance at regional assessment and learning centres. There are hopes to extend this pilot, both in its geographical scope and in the range of learning resources (e.g., CD/ DVD might be developed). Despite the fact that the distance taught students performed better on the final examinations than the campus-based students, the acceptance of the distance degree is very low. This is a cultural constraint to the effectiveness of more flexible learning styles in Nepal and Bhutan, and we will come back to this issue later. Tribhuvan University is currently planning to use some distance learning processes in all their programmes as a way of spreading understanding and acceptance of the method. There is a recognised need for the development of academic staff in this area. "As it is not possible to recruit competent human resources in the distance education sector, the only way left is to develop the human resources after they enter into the job" (Thapaliya, 2006, p. 2). An additional opportunity is the need to provide CPD to government officials in the civil service at their work locations throughout Nepal.

A recent phenomenon in Nepal, especially in the Kathmandu Valley, has been the meteoric growth of 'affiliated colleges' that are associated with the university. Most of these 'colleges' are in fact small (some very small) specialist teaching centres that prepare students in a limited number of subject areas (e.g., business management or ICT) and act as feeders for the appropriate university courses that are delivered centrally on a campus in Kathmandu. The presence of so many affiliated colleges throughout Nepal makes it feasible to run face-to-face workshops or offer support and access to technology for many people throughout the country. The rapid proliferation of these colleges does, however, present challenges for quality assurance, consistency in the level of access to learning resources, and the general issues of equivalence of the student learning experience.

Tribhuvan University is also a partner in a network of Asian universities trialling networked videoconferencing, especially for science and technology subjects. A standard videoconference

'lecture' is delivered to the network of participating Asian universities by a staff specialist, and using Internet relay technology, the class of students at each participating site have a brief opportunity to question the lecturer. This technology, which tends to use teacher-centric lecturing, seems to be more acceptable in Nepal than print-based distance education. Although the technology is very expensive, and therefore restricted to a very elite group of students (a class of about 20 engineering students in the event in which we participated) the similarity of the pedagogy to 'conventional' teaching (i.e., the visual stimuli of a specialist lecturer giving an oral presentation, accompanied by diagrams on a whiteboard, etc.) is less challenging than a more radical pedagogy of independent, student-driven learning. In fact, it could be argued that pedagogy is a major deterrent to the introduction of many forms of distributed education in both Nepal and Bhutan.

Where a belief in the importance of content and in the authority of the teacher as knowledge expert prevails, those forms of distributed education which pass more control to the learner are inherently suspect. The importance of the content prevails over the educational context, and learning styles are conditioned to perpetuate the role of passive learners rather than critical thinkers seeking to apply their acquired knowledge in new ways. This is not just a problem of education in Nepal and Bhutan of course, and will be familiar to educationalists worldwide, but to some extent this regional approach has been accentuated by lack of resources. The student-centred pedagogy of much Western higher education depends on the availability of books, journals, libraries and online resources. These are very much more restricted in less developed countries and consequently reliance on the teacher and the content knowledge of the expert is understandable. Videoconferencing, using satellites rather than landlines, is an obvious technology for distributing education to remote colleges in Nepal, although this gives rise to a whole set of subsequent problems that are political as well as educational in nature – e.g., the degree of centralised control over course delivery; the level of two-way interaction; priorities over the allocation of expensive equipment and scheduling of its use. In a region where expensive technologies and other learning resources are scarce, there is a strong tendency towards centralisation of control, and this is directly contradictory to the principles of making access to higher education more flexible.

The situation is slightly different in Bhutan, partly due to the scale of the university, partly to the short length of time they have had to consolidate the development of the university, and partly due to the geography. The immediate demands for networked teaching technologies are less obvious for Bhutan as the colleges each teach different subjects. There is a wide diversity in the pedagogy and pedagogical sophistication across the RUB, although the range of subject courses and disciplines is much more limited, as would be expected of an embryonic university. Pedagogic approaches range from the very traditional Buddhist style of memorization and oral contact in the Dzongka language of the college of traditional medicine, to the more recognisable western interaction (in English) of the two centres of teacher education. The latter have recently experimented with Moodle as a tool for teaching and learning, and have expressed interest in other forms of open source software solutions. The current opportunities for open access to education are largely restricted to a limited number of specially equipped college campuses as the mountainous terrain does not allow ubiquitous radio coverage; television access is sporadic and growing slowly from a previous period when it was tightly controlled by government (Raptan, 2001; McDonald, 2004); and Internet access outwith a few locations in the capital is largely restricted to a small number of government offices and colleges. In Bhutan, therefore, the introduction of educational technology to facilitate more flexible delivery of higher education, might be at least initially, concentrated on the provision of diversifying the modes of learning for campus-based students so that they can spend less time in the classroom and more in directed private study. Access to course readings via print, CD, audio cassettes, (and the Internet as access

grows) to supplement class notes and interaction with tutors and peers might be more appropriate in the immediate future for introducing an element of distributed education in Bhutan. There are, however, significant opportunities for the employment of distributed learning methods and resources for the continuous professional development of staff located at the scattered network of colleges, and we will consider this issue in the final section of this paper.

Exploring Potential Solutions

In both Bhutan and Nepal there are two complementary challenges to the effective adoption of distributed learning techniques, the first being the technical limitations, and the second, the more substantial in our view, being the cultural 'mind shift' that is required. Although there are many similarities between the two countries there are also many differences. Furthermore, while it would be convenient in this paper, it would be wrong for us to lump them together too closely. Consequently we will proceed cautiously in dealing with some general issues, and punctuate this with reference to specific differences where these occur.

Technical challenges

Despite being formidable, the technical challenges can be dealt with here fairly easily. As we have seen globally, ICT is a very fast-moving subject area, and this produces communications solutions for now that were regarded as distant dreams just a few years ago. We have little doubt that this will also apply to Bhutan and Nepal. Both of these countries have seen the rapid adoption of new technologies where appropriate and affordable – i.e., both have experienced a massive growth in the use of mobile phones in an area where landlines are inconsistently reliable or impossible to deploy. One of the bonus points about being a less-developed nation with a strong motivation to engage in technological change is the ability to learn from the experience of others and leapfrog over their early mistakes. If Bhutan and Nepal continue to concentrate emphasis on appropriate technologies, then there are several immediate options available. It is clear from our work in these areas that for both Bhutan and Nepal there can be some quick wins in achieving a more open, flexible curriculum by focussing initially on the provision of asynchronous learning activities for conventional campus-based students. In the case of Nepal, this could be extended to cover networked provision for students attending a number of the remote campus locations. The roll-out beyond the main Kathmandu campus of the current experimentation in videoconferencing to include a network of key locations throughout Nepal is a good example of this.

Lack of adequate access to up-to-date print resources can be partially addressed by the digitisation of key articles and incorporating these on a CD and/ or a VLE that can be accessed out of class from key institutional locations. The educational advantages of broader bandwidth access to the Internet are the subject of discussion in western educational establishments (Rennie & Mason, 2005) and even at this stage there are signs that these issues are being considered in different ways for Nepal and Bhutan. For example, although in the early stages of deployment, our discussions with Nepal telecom indicate that broadband access to the Internet is set to have a massive increase in availability, at least in the Kathmandu Valley. Wireless access options are also being planned for urban areas, and the extension of this may be the only realistic option for the more rural locations. This may seem to be rather optimistic, but the rapid adoption in recent years of mobile telephones in preference to static landlines has demonstrated that, when it is appropriate, new technology is capable of providing innovative solutions to the particular difficulties of developing countries. In the case of Nepal there are substantial benefits to be gained by the provision of asynchronous learning materials, including:

- Reduction in the (currently heavy) conventional teaching load
- Greater consistency of course quality across the university where the same course is taught on multiple sites
- Reduction in duplication and better deployment of human resources
- Better use of scarce learning resources
- Better social inclusion of learners to include the more rural areas.

In Bhutan, the scale of the issue is different, and though both the mountainous terrain and the level of public awareness may be serious constraints to general access to the Internet, there are a number of obvious aspects that require consideration. Technologies that facilitate collaborative working and access to shared resources will be a major advantage for staff development, and in helping to build a corporate culture for the new Royal University of Bhutan. They will also be beneficial in the provision of open and distributed learning opportunities for government staff in local departments throughout the country. Although students in Bhutan currently re-locate to the campus providing the specialist subject that they have selected, the adoption of improved communications and distributed learning techniques may also offer significant opportunities to provide short courses, part-time study, CPD, and new subjects that are delivered on a network basis throughout the national campus network. Such a solution might also go some way towards addressing the concerns, raised by Wangyal (2001) and reported from many other parts of the world, that the dislocation of students for the purposes of study in locations far from home may have a disruptive effect on rural society.

Socio-cultural challenges

Although the technical challenges are not to be underestimated, our work to date indicates that the cultural shift required to recognise and implement the benefits of open and distributed learning in Nepal and Bhutan is of a much greater order of magnitude. The heavy reliance on an oral tradition, lectures, seminars, and discussion, as the main, or only, means of knowledge transmission is in part a legacy of the monastic tradition (Phuntsho, 2000; Wangyal, 2001) and partly a result of the general scarcity of other media. There is also a contention (as expressed, for instance, in the writings of the latter authors, such as Phuntsho, 2000, p. 100) that there are stereotypical views of 'Western' attitudes to education versus 'Eastern' motivations, the former being typified as largely for personal gain and career choices and the latter being the pursuit of knowledge as self-improvement for its own sake. We would certainly challenge this gross generalisation, but some elements we observed do have a bearing on the uptake of open and distributed learning opportunities. The cultural tradition of great deference to teachers and tutors has placed a premium upon received knowledge, and even though Wangyal (2001, p. 109) notes that "According to traditional values individual self-discipline is considered important for harmonious co-existence," this does not appear to be a strongly motivating force towards greater learner autonomy and the use of multiple media for student-centred learning. This is especially evident in Bhutan, where the Buddhist traditions frequently result in great discomfort with the western notions of 'critical thinking' and 'critical appraisal' as these are (erroneously) conflated with the notion of criticising the teacher or subject expert.

Grow (1991, p. 129) has defined a four-stage self-directed learning model which outlines the elements that are crucial for the effective deployment of successful open and distributed learning courses. The majority of the higher education in Bhutan and Nepal would appear to correspond with "Stage 2." This stage categorises the student as "interested," the teacher being recognised as a motivator or guide, using for example an "inspiring lecture plus guided discussion and goal setting." In Stage 3, the student is "involved," the teacher is a facilitator and uses seminar

"discussion facilitated by the teacher who participates as [an] equal." If a goal of distributed learning is to produce self-directed, lifelong learners, with more open and flexible access to higher education, then much work remains to be done in both Nepal and Bhutan to create a favourable educational culture. In particular, government, employers, students, and educationalists themselves need to be convinced of the validity and robustness of the Quality Assurance process that governs distributed learning.

Clearly there are issues here of institutional vision and educational leadership. The desire and the requirement to design appropriate solutions for distributed learning in Bhutan and Nepal can substantially benefit from collaboration with trusted external partners. Although the importance of the need for outstanding educational leadership is not only applied to the developing open education models in Bhutan and Nepal (Hitt & Hartman, 2002) their current situation makes the recognition of good educational leadership much more critical. In both countries, only a very small proportion of the total population receive higher education. There is an urgent need to extend social inclusion to the educational sphere in order that society can address important domestic difficulties in economic, environmental, social, and political matters. The proportion of qualified, local academic staff is an even more elite section of society, so they are simultaneously well placed to provide innovative, far-sighted policies for the structure of open education and disadvantaged in promoting their case in the country as a whole.

Although distributed learning presents an attractive option for 'progressive' educationalists in Nepal and Bhutan, and though scope exists for modest gains in the short and medium term, we are less convinced that sufficient institutional motivation exists for the required curriculum redesign that will facilitate this. In addition to the usual staff concerns that have been common in western colleges and universities relating to the reduction of contact hours, the need for skills training, and possible redundancies due to over-capacity, there is a fundamental leap required in the redesign of assessment instruments. As Hedberg and Lim (2004, p. 203) note, "While curriculum redesign is an important factor to ensure effective e-learning, assessment approaches also need to be considered if effective change is to occur. Curriculum and assessment are interdependent and mutually supportive."

Any consideration of the immediate to mid future of distributed learning in Bhutan and Nepal would predict, at most, cautious progress. Both countries are well placed to take appropriate advantage of new technologies without requiring a replication of the infrastructure or the historical mistakes of the industrialised countries. Progress will be determined less by overcoming technical barriers, and more by accommodating fundamental socio-cultural shifts in attitudes towards education. This needs to be accompanied by the articulation of a clear vision of institutional goals, the provision of resources commensurate with the tasks identified, and by encouraging widespread collaboration throughout the institution and with educated society in general.

Summary

The following table summarises the similarities and differences in the implementation of distributed learning in Nepal and Bhutan.

Similarities and differences

- Much of the country consists of remote and mountainous terrain

- Longevity of the university sector (Nepal 50 years; Bhutan 3 years)
- Consistent challenges to providing up-to-date educational resources
- Basic model of distributed education (Nepal utilises local learning centres; Bhutan requires students to travel to geographically scattered campuses)

Cultural resistance to education at a distance

Cultural differences in educational tradition (Nepal = Hindu; Bhutan = Buddhist)

Poor IT infrastructure over most of the country

- State of readiness for IT learning solutions (e.g., Nepal experimenting with video links and wireless Internet; Bhutan experimenting with Web-based solutions, but in major institutions only)
- Largely an instructivist mode of tuition (tutor-led)
- Scale of public access to the higher education system

Conclusions

It is generally acknowledged that introducing technology is far easier than changing pedagogy. This applies to the higher education scene in both Nepal and Bhutan where landline technology is particularly problematic due to the mountainous terrain. Nevertheless, mobile and satellite technology can leapfrog over traditional solutions and offer some 'quick wins' in both countries, as they have in other developing countries. Media such as videoconferencing which do not disturb existing attitudes to teaching and learning are probably going to be the most acceptable in the short term at least.

Bhutan has a stated policy of resisting 'inappropriate' westernisation and to the extent that this is successful, a pedagogy of self-directed learning will probably continue to be resisted. Given their existing system whereby the student travels to the appropriate college, there is less need to develop a truly distributed university. Introducing elements of resource-based and student-centred learning for campus students, however, may be the way forward to taking advantage of the best aspects of flexible learning.

Nepal has the beginnings of a distributed network of colleges and hence may find more drivers to develop the technologies and the pedagogies that lead to distributed learning. However, adding greater flexibility to existing campus courses so that students can work to support their studies – as is increasingly common in western universities – may be the most effective starting point in Nepal. Some quick wins can be achieved by focussing initially on the provision of asynchronous learning activities for conventional campus-based students and, in Nepal, by extending the roll-out of videoconferencing delivery to student locations outwith Kathmandu. In both countries, the digitisation of key print resources and incorporating these on a CD and/ or a VLE can partially address student access to relevant, up-to-date sources of academic literature. Wireless access may soon offer a realistic option for off-campus access to resources in both urban and some more rural locations. In Bhutan, collaborative Web-based technologies and access to shared resources, even

though in the medium term these are only available on the major campuses and in government institutions, will offer a major benefit for staff development, and help to build a culture of distributed learning for the new university.

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The Current Status of e-Learning and Strategies to Enhance Educational Competitiveness in Korean Higher Education

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Abstract

The purpose of this study was to examine the current status of e-Learning in Korean higher education and find ways to encourage the further use and development of e-Learning systems that aim to enhance Korea's academic competitiveness. A total of 201 universities in Korea (27 national and public, 163 private, and 11 national universities of education) were examined in this study. At the time of the study, 85 percent of the universities and colleges had investigated implementing e-Learning. There were special e-Learning teams in most national and public universities, as well as private universities and colleges. Findings from this study found that both teachers and learners alike, lacked meaningful support systems and opportunities to actively participate in e-Learning programs. Although such lack of support was found to be endemic, such lack of support and opportunity was found to be more acute in private universities, private colleges, universities of education, than mid-sized, small-sized, and provincial universities and colleges. Except for a few mid- and small-sized universities and colleges, most large universities and colleges were equipped with technical support such as infrastructure and operational platforms. These same schools, however, did not provide institutional support, nor did they employ appropriate policies needed to further the quality and enhancement of e-Learning offerings. Also, there was no meaningful link found between schools and industry, nor was there adequate financial support in place for the implementation of e-Learning systems, simply because many universities failed to allocate sufficient funding for e-Learning.

In conclusion, the strategies for enhancing university competitiveness through e-Learning are as follows: 1) establishing support strategies according to the types of universities; 2) developing quality assurance systems for e-Learning; 3) enhancing support systems for professors and learners; 4) developing knowledge sharing systems between schools and industry; 5) enhancing international collaboration for e-Learning; and 6) developing and supporting e-communities of knowledge for research and education.

Keywords: e-Learning; e-Learning strategies; higher education in Korea; e-Learning in Korea; e-Learning policy

Introduction

Traditionally the role of universities is to produce, distribute, and apply knowledge to various contexts (Brown & Duguid, 2000; Duderstadt, 2000). Unquestionably, research, education, and service to the larger academy and greater society are major functions of most universities. In the present era of knowledge-based societies, however, there remains a great need to move beyond the traditional roles for universities (de Alva, 1999; Duderstadt, Atkins & Van Housweling, 2002). For example, James Duderstadt (2000), a former president of the University of Michigan, stated in his book, *A University for the 21st Century*, that universities should: 1) move beyond the roles of research, education and service and be a knowledge server engaged in producing, conserving, distributing, and applying knowledge to different contexts; 2) serve as learning communities for teachers, learners, and graduates by preparing them to engage in life-long learning; and 3) change organizations into learner-centered systems wherein learners determine and control what, when, where, how, and with whom to learn.

Tremendous effort will be needed to achieve Duderstadt's (2000) goals. However, this can only be achieved through the provision and application of information and communication technology (ICT) designed to establish universities as both knowledge servers and learning communities. In this effort to innovate universities, the introduction and utilization of e-Learning will be a critical component. Using e-Learning systems, course lecture contents such as that delivered in traditional classroom settings, can be saved to the 'knowledge server' to add the cumulative knowledge stored by a university. Such content can then be used by students, as well as others who may be interested. Further, the quality of the 'knowledge server' will likely only get better with time, especially as more information and data is gathered and archived. Clearly, e-Learning goes beyond the limitations imposed by time and space (such is typical in traditional educational systems) to provide learning opportunities for all members of the general public. e-Learning also can enable one to enjoy high quality academic programs. Moreover, since e-Learning is based on self-regulated learning, universities should evolve to become learner-centered educational entities, further contributing to the continued innovation of any Korean university.

At present, most Korean-based universities have either introduced an e-Learning plan or have implemented such a plan. Moreover, many students have taken fully online courses or have experienced Internet-based classes. New and unexpected problems have emerged, however, with the increase in e-Learning. Such problems include: the development and maintenance of infrastructure; stabilization, enhancement, and standardization of operational systems; management of academic records and policy issues; quality and management of course contents; increased faculty workload; and the general lack of support for learning, to name a few. Further, current e-Learning programs on offer are severely limited in scope simply because they continue to operate within classroom-based educational paradigms. Put simply, broader educational strengths of e-Learning are not yet being fully realized. Put simply, universities general lack of vision and innovation has created barriers to e-Learning. More significantly, they have not yet learned how to enhance their institutional competitiveness by taking advantage of ongoing opportunities to utilize e-Learning. To address these problems, therefore, it is necessary to carefully examine the current state of e-Learning in Korea in terms of actual utilization of e-Learning by a university-by-university basis. It is anticipated that such an examination will shed new light on emerging developmental strategies that can support more effective e-Learning systems.

e-Learning in Korean Higher Education

The history of developmental process of e-Learning in Korean universities

e-Learning in Korean higher education began in the late 1990s when several Korean universities introduced their own online classes. Soon after, other Korean universities formed a consortium with the aim of offering an intra-campus exchange of online courses and credits. In 1997, the South Korean Ministry of Education and Human Resources Development (MEHRD) initiated the "Model Universities of Cyber Educational Programs," which allowed specific schools to model and build e-Learning programs for implementation elsewhere in Korea. Initially, this endeavor comprised 65 domestic universities and gradually expanded to include more. These programs acted as a catalyst for increasing public awareness of e-Learning throughout Korea. In 1998, for example, cyber universities such as Korea National Open University (KNOU) were established to provide online teaching and learning activities. During this same time, other universities started to introduce and operate their own independent cyber university programs. Soon, even those universities that were not participating in e-Learning started to recognize the importance of e-Learning.

In 1998-99, and soon after the MEHRD-sponsored "Model Universities of Cyber Educational Programs" had succeeded in drawing greater interest in e-Learning from a large number of schools, MEHRD passed into law the "Promoting Lifelong Education Act." This law, which as passed in March 2001, made it possible to establish cyber universities in Korea. The law also granted cyber universities the right to offer all their course offerings and programs online, as well as the authority to confer undergraduate degrees. In total, nine cyber universities opened in 2001. Six more opened in 2002. One in 2003, and two more in 2004. As of 2006, there were 17 cyber universities in operation across Korea.

This explosion of new universities has not come without a host of problems, including: the lack of administrative stability; classes and course contents of marginal or limited quality; and the questionable adequacy of educational services. Nevertheless, as of 2003 there were more than 40,000 students registered in these 17 universities, and each student can be said to be benefiting from an increase in flexible educational opportunities (i.e., lifelong education and diversity in higher education).

With the passage of the Promoting Lifelong Education Act in 2001, Korean e-Learning and cyber universities have become key components in the country's higher educational system. As a result, other universities have also begun to offer e-Learning as an option. e-Learning in non-cyber universities is now being offered in conjunction with traditional face-to-face classes in so called *blended learning* situations. Moreover, there has been a steady increase of e-Learning in Korea in general, which is reflected in more credit exchange programs springing up among universities. Some universities have even begun to establish and operate cyber universities in the form of specialized graduate schools under the Higher Education Act, instead of relying on the Promoting Lifelong Education Act. That is, cyber graduate schools are operated as part of specialized graduate schools and offer their curriculums via an e-Learning system. As of 2006, there are six cyber graduate schools in Ajoo, Sookmyung, KNOU, Sejong, Joongbu, Sungkyunkwan universities, all which confer Master of Arts and Master of Science degrees. Except for KNOU, which operates its programs under the Promoting Lifelong Education Act, these other five cyber universities confer formal Master degrees under the Higher Education Act.

In 2002, e-Learning in Korean higher education was given a huge boost by a government program called "E-campus Vision 2007," which was a sub-part of a larger government program entitled: "Comprehensive Plan for the Encouragement of Using Information Communications

Technology (ICT) in Universities." This new program was initiated in response to the struggling state of ICT in universities. The Korean Government, aware that despite a high level of informational infrastructure, realized that there was a paucity of appropriate e-Learning information being compiled, developed, and utilized in various databases, such as education and academic research. There was also inefficient exchange of information between and among universities and wide gaps in the technological levels of those schools using ICT. In addition, there were shortcomings found in the application of leading technologies, such as up-to-date e-Learning instructional techniques and e-Learning support systems. Finally, weak legislative and institutional systems slowed the growth and momentum of e-Learning across Korea.

In order to resolve these problems, MEHRD announced a Comprehensive Plan for Promoting the Use of ICT for Universities in 2002. This plan presented several key steps, the most critical being the task of expanding Korea's e-Learning infrastructure and the sharing and distribution of education and research information on e-Learning. In response, MEHRD designated 10 regional areas and announced plans to establish an e-Learning support center for each region. These regional e-Learning support centers aim to provide assistance in developing learner-centered teaching practices and applications. These centers will also assist faculty who are using e-Learning in their classes, and lend general support in establishing both the infrastructure and learning techniques needed to support e-Learning. When and where necessary, these centers will provide e-Learning specialists who will facilitate the creation of solid support systems among universities.

Each e-Learning support center is equipped with studio-type instructional rooms, integrated support systems for teaching and learning, and editing and distribution systems. e-Learning centre staff members support content development, instructional management, and other technological and administrative tasks (KERIS, 2003). As of 2006, seven regional e-Learning support centers were active in Jeju University (established 2003), Kyungsang University (established 2004), Chunnam, Kangwon, and Youngnam Universities (established 2005), and Chungju and Chunbuk Universities (established 2006).

In furtherance of its mission to promote e-Learning, each support center engages in a wide range of common projects such as the collaborative development, sharing, and use of contents within universities throughout Korea. Each center has also been hard at work identifying specialized projects such as content development in the field of tourism, or seeking out ways to increase university-industry collaboration for e-Learning. Another highly specialized project is the creation of support systems needed to develop military human resources. These projects are prime examples of regional efforts that aim to enhance the competitiveness among and improvement of Korea's entire system of universities.

Basic Directions for e-Learning in Korean Higher Education

What is the vision and direction for e-Learning in Korean higher education? The Ministry of Education and Human Resources (MEHRD, 2004) announced a comprehensive improvement plan for e-Learning for the realization of a 'learning society' and development and innovation of human resources. In this report, MEHRD emphasized an innovative approach to balancing high education and competitiveness through the provision of e-Learning. In order to achieve this goal, the ministry proposed several steps, including: improving the general research environment; promoting greater specialization in particular academic fields; supporting the development of high-quality e-Learning curricula; and erasing the knowledge gaps that exist among universities in the 10 regions.

Korea's approach to e-Learning, however, is not without merit. According to Kim (2004), Korean universities want to utilize e-Learning because it offers: 1) less limitation in time and space compared to traditional offline classes; 2) the possibility of providing multiple learning practices based on self-regulated learning for adults; 3) individualized learning based on personal needs and the possibility of project-based teaching, which allows for more effective and interactive teaching and learning strategies; 4) diverse educational information and services; 5) a high assurance of information accuracy; 6) interactivity in the process of communication; and, 7) cost effectiveness compared to traditional classroom-based teaching and learning. Simmons (2002) also observed that although there are many different types of re-usable e-Learning formats, ranging from the simple to the complex, e-Learning in institutional contexts have three distinct goals: 1) individualized learning, 2) the sharing of knowledge, and 3) the interactive use of e-Learning technology. Leem (2004) advocated three additional goals as e-Learning strategies to enhance the quality of university education: balancing progress among universities; narrowing regional gaps; and strengthening the potential of universities, collectively and individually, through specialization of e-Learning. And finally, Lim and Leem (2005) have also suggested a set of e-Learning policies to improve the quality and balance of e-Learning in Korean higher education. This includes emphasis on building professional e-Learning organizations and activating spontaneous community activities. The creation of high quality e-Learning systems includes building knowledge portals to share information and developing standard digital contents and management strategies.

In summary, the current direction that e-Learning is taking in Korean higher education today can be listed as follows:

- First, e-Learning in higher education should reflect the ideals of university learning in the era of knowledge-based society, provide a space for knowledge production, and share this knowledge with the learning community.
- Second, e-Learning in higher education should, more than anything else, aim to enhance the quality of overall university education.
- Third, e-Learning in higher education should aim to narrow regional gaps on the level of education and academic research.
- Fourth, e-Learning in higher education should be geared towards strengthening competitiveness through specialization.

A Survey on the Current Status of e-Learning in Higher Education

The primary goal of this study was to examine the current state of e-Learning in Korean higher education. All the respondent universities were investigated using a survey questionnaire. The survey questionnaire was designed to gather data used to examine the present status of e-Learning in Korean higher education and gather objective data used to predict future directions of e-Learning in Korea. Accordingly, this study yielded basic data to help us assess the current state of e-Learning in Korea, and objective data on the attitudes of those involved to help us identify existing problems and possible solutions to fix such problems.

Subjects

All 201 national or public universities including KNOU, private universities, and national universities of education in Korea were examined: 25 national universities, two public universities, 163 private universities, and 11 national universities of education.

Methods and Procedure

The survey questionnaire, previously developed and used in 2002 for the investigation of the state of nationwide cyber education (Lim, Leem and Jung, 2003; Lim & Leem, 2004), was modified to fit into the goals of this study. The survey included question items to establish whether or not individual universities had existing e-Learning programs; collaborative relationships with other universities; and specific support organizations in place. In addition, the current state of the e-Learning system and problems in e-Learning programs used on campus were also investigated.

To make sure all the universities could participate, the survey was administered twice between mid-October and the end of October 2004. The survey was sent via email or mail, attention to the officer or staff person in charge of e-Learning under the names of MEHRD and KERIS. Responses were collected via email, fax, or mail. The returned data were coded using SPSS 11.0 for Windows and analyzed using mainly descriptive statistics; to see whether there were any statistically significant differences in the results, inferential statistics were also undertaken according to the type of universities (national, public, or private universities of education), the size (large or mid-/ small-sized), and location (city or provincial).

Survey Results

Survey response rate

According to the type of universities, 26 national and public universities out of 27 returned their responses (including KNOU), while only five out of 11 national universities of education did so. In the case of private universities, 66 out of 163 universities responded, yielding a 40.5 percent response rate for private universities. Among all the universities that responded, 38 large size universities out of 68 (56%) responded; while only 28 out of 98 mid-/ small-sized universities responded (28.5%). In terms of geographical location, 34 out of 74 universities (45.9%) that responded to the survey were located in Seoul or vicinity; while 57 out of 124 provincial universities did so (45.9%), yielding the same response rate. Overall, 92 out of 201 universities (45.8%) participated in the survey. Table 1 is on the next page.

Table 1. Response Stated by Type and Size

Type	Size	No.	No of universities responded	%
National/ public	Large*	20	17	85.0
	Mid or small**	7	4	57.0
	Total	27	21	77.8
Private	Large*	68	38	55.9
	Mid or small**	95	28	29.5
	Total	163	66	40.5
National Universities of education	Mid or small **	11	5	45.5
Total		201	92	45.8

* Large = enrollment of more than 10,000 students

** Mid or Small = enrollment of less than 10,000 students

Overall Status of e-Learning in Regular Four-year Universities

Percentage implementing e-Learning ~ Among universities that responded, 85 percent of the universities reported that they were using e-Learning educational systems. There were statistical differences found among the type and size of the universities.

As shown in Table 1, e-Learning was used most widely by large national and public universities, which can be contrasted to mid/small-sized universities which revealed that participation is only slightly lower. That is, regardless of whether they are national or public, nearly all of universities surveyed had some form of e-Learning programming in place. Among large private universities surveyed, 97 percent indicated that they had their own e-Learning in place, while only 68 percent of mid-/small-sized universities did so. In addition, only 40 percent of the national universities of education reported that they had e-Learning programs.

Table 2. State of implementing e-Learning

Type	Size	No. of universities responded	No. of universities implementing e-learning	%
National/public	Large*	17	16	94.1
	Mid or small**	4	4	100.0
	Total	21	20	95.2
Private	Large*	38	37	97.4
	Mid or small**	28	19	67.9
	Total	66	56	84.8
National Universities of education	Mid or small**	5	2	40.0
Total		92	78	84.8

* Large = enrollments of more than 10,000 students

** Mid or Small = enrollments of less than 10,000 students

Support for Cyber Class (e-Learning class) on a University Level ~ Seventy-six percent of the universities reported that they run and support e-Learning classes on a university level and had appropriate policies in place. While 90 percent of national and public universities, and 76 percent of private universities, confirmed they had such support systems; only 20 percent of universities of elementary education responded that they had such supportive operation systems in place. In terms of student body size, 89 percent of large universities with more than 10,000 students reported having such systems in place; only 54 percent of mid-/small-sized universities with less than 10,000 students reported having e-Learning in place, revealing some statistical difference.

Independent Support Organizations for e-Learning ~ It is necessary to have independent support organizations to effectively run e-Learning programs. Of those universities that responded to a question that sought to determine of level of independent support organizations needed to underpin e-Learning, 61 percent of those universities surveyed reported that they had such an independent organization in place; there was no significant difference found among the different types or locations of universities. In terms of size, however, universities with more than 10,000 students (78%) reported having an independent organization in place, while only 35 percent of the universities with less than 10,000 students had such organizations in place.

Collaboration with Other Universities or Institutions

Consortium with Other Universities ~ Fifty-one percent of the universities reported that they had formed a consortium to share e-Learning systems with other universities. There were no

differences found in universities in terms of type or geographic location, however. In sum, 58 percent of the universities with more than 10,000 students and 40 percent of the universities with less than 10,000 students reported in engaging in such consortiums, again showing some difference according to the size.

Partnerships between University and Industry and International Cooperation ~

According to the results of the analysis on the collaboration or cooperation between schools and industry in terms of running e-Learning programs or programming, only nine percent of the universities reported that they had cooperative systems in place with private sector companies. Though minor, the number of private universities which had such cooperative/ collaborative relationships with industrial organizations was twice as large as compared to national and public universities. In addition, only four universities (4.5%) reported having collaborated with foreign universities. These universities were all large and located in Seoul or vicinity.

State of Content Development

State of Content Development within a University ~ The percentage of universities reporting that they have been developing specific contents within a university level was 74 percent. More national and public universities (85%) reported that they were developing their own contents, while 76 percent of private universities reported developing contents on their own or through outsourcing. There was some difference found in terms of the size of the universities. Eighty-six percent of the universities with more than 10,000 students surveyed, and only 57 percent of the universities with less than 10,000 students surveyed reported developing their own contents. The contents developed by these universities, however, were mostly for PCs. Further, there were only two private universities which were involved in the development of mobile-based contents development. It seems, therefore, that Korean universities are seriously lacking in preparation for mobile learning.

State of Purchasing Contents Developed Externally ~ There were a very small percentage of universities (24%) who reported that they had purchased contents from external companies. In fact, there were no overall differences according to the type and size of the universities in the pattern of securing their own contents, in that these universities were developing or outsourcing the contents in most cases, instead of purchasing existing commercial programs.

Supports for Teaching Staff and Learners

Supports for Teaching Staff ~ According to survey results, the most typical means of support was to provide incentives to teaching staff for content development and the provision of support and management through specialized organizations. Less than half of the universities, however, reported providing support for tutors and there was a substantial lack of incentives for faculty. Thirty-four percent of the universities awarded extra credits for faculty achievement evaluation. Twenty-six percent of the universities reported providing monetary reward in case of excess in enrollment; and 21 percent reported reducing teacher workload (i.e., less teaching hours). Only a small number of private universities reported an award for excellent content. Regarding the criteria of supporting teaching staff, there were statistically significant differences found between the type and size of the universities. Most national and public universities provided funding for content development, while only 66.7 percent of the private universities surveyed did so. In the case of national universities of education, only one reported providing such support. Further, most large-sized universities surveyed provided funding for content development, but less than half of the mid-/small-sized universities did so. There were also significant differences in other supporting areas reported as well: large-sized universities provided more support in the form of

specialized organization and awarded more credit for the evaluation of faculty achievement than mid-/small-sized ones. There was a statistically meaningful difference found in terms of provision of more teaching assistants or tutor based on the locations of the universities investigated. The universities in Seoul or its neighboring areas (64.7%) provided more teaching assistants or tutors than those in provincial areas (37.9%).

Table 3. State of Faculty Support for e-Learning

Items	(%)	Type(%)			Size(%)		Location(%)	
		National/ public	Private	Nat'l Univ. of Education	Large	Mid & Small	City areas	Provincial
The cost of content development	68.5	90*	66.7*	20*	85.5*	43.2*	79.4	62.1
Support from specialized organization for content development and management	59.8	55	65.2	20	74.5*	37.8*	70.6	53.4
Assistants or tutors for content development of class management	47.8	50	51.5	0	54.5	37.8	64.7*	37.9*
Extra credit for the evaluation of faculty achievement	33.7	20	41	0	41.8*	21.6*	29.4	36.2
Incentives offered in case of excessive enrollment.	26.1	15	31.8	0	29.1	21.6	26.5	25.9
Reduction of teaching hours	20.7	10	25.8	0	20	21.6	26.5	17.2
Award or monetary compensation for excellent contents	6.5	0	9.1	0	9.1	2.7	11.8	3.4

* Statistically significant items

Supports for Learners ~ There was an overall lack of support found for learners involved in e-Learning. On the questionnaire items regarding the credit acknowledgement or limit in enrollment, only half of the universities surveyed responded in the affirmative. Only 40 percent of the universities reported that they provided tutors, assistants, or digital libraries. In addition, only one third of the universities had separate evaluation systems for classes and very few universities reported providing training or seminars for learners on e-Learning. It can be assumed, therefore, that there were no systematic or goal-oriented support programs for learners in the universities surveyed.

There were statistically significant differences in the provision of diverse services at large universities, however, as compared to mid-/ small ones. In fact, there was a significant difference between the two groups of universities in terms of problem-solving systems for technical difficulties, the acknowledgement of credits, limits placed on enrollment, and the provision of

digital libraries, and so forth. In addition, there was also statistically significant differences found in terms of providing solutions for technical difficulties and independent course evaluation systems between the universities in cities or its neighboring areas versus those in provincial areas.

Table 4. State of Learner Support for e-Learning

Supporting Items	(%)	Type (%)			Size (%)		Location (%)	
		National/ public	Private	Nat'l Univ. of Education	Large	Mid & Small	City areas	Provincial
Immediate problem-solving for technical difficulties	72.8	90*	74.2*	0*	87.3*	51.4*	85.3*	65.5*
Partial or full acknowledgement of credits taken other cyber universities	52.2	55	56.1	0	65.5*	32.4*	55.9	50.0
Limit on enrollment per cyber class	47.3	50	50.8	0	57.4*	32.4*	47.1	47.4
Helping Learners using tutors or assistants	41.3	35	47	0	50.9*	27*	50.0	36.2
Provision of diverse service through digital library	38.0	40	37.9	40	49.1*	21.6*	35.3	39.7
Existence of separate evaluation system for cyber classes	28.3	30	30.3	0	30.9	24.3	44.1*	19.0*
Management of learning enhancement programs for autonomous learning	13.0	15	13.6	0	16.4	8.1	8.8	15.5

* Statistically significant items

e-Learning infrastructure and learning management systems

Infrastructure and Server for e-Learning ~ Of the universities surveyed, 72.8 percent reported that they have their own infrastructure and servers in place for e-Learning; this finding can be compared to 10.9 percent of respondents who reported that they relied on outside services. However, 8.7 percent of the universities reported that they did not have any infrastructure or server. While there was no difference according to the types of the universities, 86.8 percent of the universities with more than 10,000 students, and 61.8 percent with less than 10,000 students, reported that they had their own infrastructure and servers in place.

LMS for e-Learning ~ Seventy percent of the universities surveyed reported that they have a learning management system (LMS) of their own. Ninety percent of the national and public universities reported that they had their own management systems or those from the outside, while 13 percent of the private universities reported that they did not have any LMS. Regarding the percentage having their own LMS instead of ones from outside, there was a big difference between the universities with more than 10,000 (83.6%) and those with less than 10,000 (56.3%). This indicates that almost half of the mid-/ small-sized universities did not have any learning management system.

Staff awareness of problems in e-Learning

A five-point Likert-type questionnaire was administered to those staff members involved in e-Learning. The purpose of this survey was to determine and examine the problems – possible solutions – related to e-Learning at the university level. The following shows the results of the analysis.

Expertise of the Organization and the Personnel ~ Regarding the question of whether there is enough manpower to manage e-Learning, the policy makers and those who are in charge of e-Learning reported that there was a serious shortage of personnel for e-Learning. Such a shortage was found to be more serious in national and public schools than in private ones. As Table 5 shows, there was some difference found between national and public universities (4.16) and private ones (3.71).

Table 5. Staffs’ Awareness on Problems in e-Learning

Items	Mean (SD)	Type (%)			Size (%)		Location (%)	
		National/ public	Private	Nat'l Univ. of Education	Large	Mid & Small	City areas	Provincial
Lack of e-learning personnel	3.87 (1.00)	4.16*	3.71*	4.80*	3.80	4.00	3.76	3.94
Lack of expertise of e-learning personnel	3.16 (1.21)	3.25	3.05	4.20	3.02	3.39	3.06	3.22

* There was a statistically significant difference, but the post hoc analysis did not show any statistically difference between the national and public and private universities. There was, however, a statistically significant difference between national universities of education and others.

Support for Teaching Staff in e-Learning ~ Respondents were generally aware of the problems concerned with the teaching staff. Table 6 shows that they responded in the affirmative to the questions related to the lack of support for the faculty in terms of providing assistants or other incentives. In addition, they also responded that there was an overall disinterest or lack of participation on the part of the faculty.

Table 6. Problems Related to the Faculty Support

Items	Mean (SD)	Type (%)			Size (%)		Location (%)	
		National/ public	Private	Nat'l Univ. of Education	Large	Mid & Small	City areas	Provincial
Lacks support for assistants who help with content development and management	3.30 (1.37)	3.65*	3.05*	5.0*	3.13	3.58	2.94	3.52
Lack of incentives for those who are involved in e-learning	3.41 (1.17)	3.8*	3.17*	4.8*	3.35	3.52	3.32	3.46
Lack of interest and participation of faculty	3.59 (1.00)	3.5	3.59	4.0	3.62	3.55	3.62	3.57

* There was a statistically significant difference, but the post hoc analysis did not show any statistically difference between the national and public and private universities. There was, however, a statistically significant difference found between national universities of education and others.

Support for Learners in e-Learning ~ Most of the respondents did not agree with the questions that the learners were not interested or did not participate in e-Learning actively. Table 8 reveals that except for the national universities of education, they thought that the students were interested and actively participated in e-Learning.

Table 7. Awareness on Learners' Interests and Participation

Item	Mean (SD)	Type (%)			Size (%)		Location (%)	
		National/ public	Private	Nat'l Univ. of Education	Large	Mid & Small	City areas	Provincial
Lack of learners' interests and participation in e-learning class	2.59 (1.17)	2.65*	2.46*	4.0*	2.49	2.76	2.68	2.54

* There was a statistically significant difference, but the post hoc analysis did not show any statistical difference between the national and public and private universities. There was, however, a statistically significant difference found between universities of elementary education and others.

Contents ~ The survey respondents said 'neutral' on the question of whether the level of contents in current e-Learning was low. Table 8 shows that they did not think the quality of the contents were high. In fact, they said the quality of contents in the national and public universities and national universities of education were lower than that in the private universities. However, there was no statistical significance in these three different types of schools, but the staff in the national and public universities were more concerned about their quality of their e-Learning content in general.

Table 8. Awareness on the Quality of e-Learning Contents

Item	Mean (SD)	Type (%)			Size (%)		Location (%)	
		National/public	Private	Nat'l Univ. of Education	Large	Mid & Small	City areas	Provincial
The overall quality of e-learning contents is low.	2.91 (1.05)	3.30*	2.69*	4.0*	2.76	3.15	2.85	2.94

* There was a statistically significant difference but the post hoc analysis did not show any statistically difference between the national and public and private universities. However, there was a statistically significant difference between universities of elementary education and others.

Evaluation System and Quality Assurance ~ Most of the respondents thought that the levels of e-Learning evaluation and quality assurance systems were low. In Table 9, they responded in the affirmative regarding the lack of systematic evaluation and quality assurance. They said there were especially serious problems in these areas in national and public universities and national universities of education.

Table 9. Awareness on the Evaluation and Quality Management System

Items	Mean (SD)	Type (%)			Size (%)		Location (%)	
		National/public	Private	Nat'l Univ. of Education	Large	Mid & Small	City areas	Provincial
Lack of systematic evaluation system on cyber classes	3.53 (.99)	3.7*	3.38*	4.8*	3.38	3.79	3.71	3.43
Lack of management system in place to enhance the quality of e-learning	3.69 (.91)	3.75	3.63	4.20	3.63	3.79	3.85	3.58

* There was a statistically significant difference, but the post hoc analysis did not show any statistically difference between the national and public and private universities. There was, however, a statistically significant difference found between universities of elementary education and others.

Conclusion: Strategies for enhancing the Competitiveness of Higher Education through e-Learning

Based on the results of the study outlined above, this paper suggests some ways to strengthen and enhance the competitiveness of Korean universities, especially at the level of policy development and implementation.

Differentiated support according to types, sizes, and locations of universities

There were differences in using e-Learning depending on the types, sizes, and locations of the universities. The national and public universities received more support for development and management through the provision of supportive policies compared to private universities or national universities of education. There is also some difference found in terms of support for

curriculum development and the provision of specialized organizations for e-Learning internal to universities. Such differences indicate that in order to establish effective policies, there needs to be differential support based on the types, sizes, and locations of the universities. At a government level, policies should be implemented that aim to provide better conditions for using e-Learning and adequate funding needed to establish organizations which are specifically and exclusively in charge of e-Learning. Governmental policies should also place high priority to the utilization of regional e-Learning support centers for mid-/ small-sized private universities and national universities of education. In addition, those national and public universities and large private universities that have active e-Learning programs should be encouraged to establish cooperation programs with diverse industries or foreign countries, and share their contents with mid-/ small-sized Korean universities.

Development of Quality Assurance Systems for e-Learning

In order to provide high quality e-Learning, content is clearly important. Other areas critical to e-Learning are: enrollment control; quality management in teaching and learning; quality and timely feedback for learners; and reliable and valid student evaluation. In other words, the resolution of these problems cannot rest solely on the shoulders of faculty and practitioners, but instead fixing these problems requires systematic support at an institutional level, including the creation of specialized organizations that support e-Learning. In this vein, the government should provide policy support for those institutions of higher education that lack quality management systems. They must be encouraged to establish specialized organizations through the provision of special educational funding. It is also suggested that the government could even utilize military personnel who specialize in computers to support such organizations, providing the much-needed manpower to launch and support such e-Learning endeavors. In addition, the government should have a long-term plan in place for developing the human resources needed to support e-Learning systems, as well as a short-term plan to offer interdisciplinary programs in the departments of education, educational technology, and computer sciences, or even an MBA or certified courses for e-Learning experts.

Enhancement of faculty support systems on a university and governmental level

Active faculty participation and effort is critical in e-Learning and therefore the provision of incentives for faculty is clearly important. Staff members involved in e-Learning currently face a serious lack of support (i.e., little financial support or reduction in workload in lieu of additional workload related to e-Learning, etc.). Without such incentives, it will be virtually impossible to expect faculty to embrace and use e-Learning as a modality. Providing faculty support, therefore, is not just an issue that impacts university level education, it impacts development and competitiveness on a national level as well. Put simply, the Korean Government should find ways to increase its support for e-Learning. For example, the government can provide awards for professors who develop outstanding contents or for faculty with excellent records in managing e-Learning. Criteria can also be created to evaluate the extent to which respective professors and universities employ e-Learning. Each university could similarly provide incentives or award extra points for professors who use e-Learning, especially the provision of credit needed for promotions or contract extensions.

Increased learner support systems to strengthen the e-Learning foundation

Compared to the issue of faculty support, little discussion has been paid to supporting learners in e-Learning classes. Learners, in general, wish to receive a diverse and quality education beyond which is currently offered in traditional classroom-based settings. It is essential, therefore, that universities provide not only technical support necessary for e-Learning, but also opportunities for learners to interact with faculty and staff online in e-Learning environments. If such quality interaction means that e-classes must be smaller, efforts must be taken to reduce the e-Learning class sizes.

Moreover, learner support tends to be more readily available at large universities than mid-/small-sized universities who tend not to provide more robust, interactive forms of learner support. And even though learner support is implemented on a university level, support at the policy level remains vitally necessary. Such support could include the offering of mutual degrees, or the creation of a 'credit banking' system that enable students to transfer any credits earned between universities. In this manner, learners can freely take e-Learning classes and acquire credits, which they can apply towards a degree or diploma. To rationalize information, the Korean Government should also develop a national e-Learning portal, which provides tutorial services between universities, and provide a centralized place to assist learners when they encounter difficulties taking e-Learning courses or classes.

Development of Knowledge Sharing Systems and Collaborative Contents: Development and management for university and industry cooperation

Few Korean universities receive the benefits of university-industry cooperation for e-Learning, even though some unique partnerships between universities and industry – albeit limited – are in place. Use of industrial e-Learning contents, or the provision of e-Learning contents developed by private sector companies and corporations remains limited and overall, it is opined here that industry-university collaboration still remains a relatively untapped potential in Korea. Indeed, truly meaningful e-Learning collaboration should involve the development of learning contents by both universities and industry. For example, expert groups from both Korean universities and industry could work together to research, design, and implement e-Learning course contents in their respective fields. Both university and industry could also provide incentives for those who participate in e-Learning contents development. In terms of end users, students who take e-Learning courses should be given incentive to upgrade their knowledge and skills via e-Learning. Mutual interests must be established between the university and the private sector, including the sharing of knowledge and information via a 'community of knowledge.' In this manner, online e-communities can be formed that connect university faculty with industry experts – specifically those who are in an ideal position to share and leverage their interests, goals and information to advance their fields. Put simply, the e-Learning contents they develop could be used to teach specific academic and professional skills, to help bridge academia to actual application in industry. And even though such efforts will undoubtedly take time and money, the support and ongoing development of such 'knowledge sharing systems' such as the e-communities between university and industry, should be undertaken at the outset in an effort to align industry needs to that of university-level e-course offerings.

Seeking international relationships for e-Learning through links among relevant organizations

Though clearly important, establishing cross-institutional relationships on an international level tend to be difficult for most universities to accomplish. Even though the exchange of academic expertise or students (i.e., via exchange programs) is relatively easy, the reality remains that it is difficult to develop e-Learning contents that satisfy the different needs of different learners studying in different areas of the world (i.e., provision of foreign language contents). Some universities in Korea, however, have plans that support the international exchange of e-Learning contents, but at time of publication there are no such programs concretely in place. A good example is the Korea National Open University's recent plan to develop e-Learning content exchange programs. Indeed, KNOU generated e-Learning content, such as 'Korean Studies,' or other common subjects such as 'Statistics' or 'Computing Science' can be developed and shared both inside and outside of Korea. However, it is suggested here that an agreement could be made with other 'institutes' that already have international exchange programs in place and vice-versa. For instance, such 'institutes' could mediate the delivery of KNOU's e-Learning contents to other countries and/ or any other institutes. In addition, universities must seek to find more effective ways to advertise and market Korean university-level e-Learning programs outside of Korea (i.e., to other countries in Asia, and to other continents such as Africa, Europe, or North America). This can only be achieved, however, through agreements with similar institutes or organizations elsewhere in the world.

Development and support of e-communities of knowledge for research and education

Even though it is generally desirable if knowledge-based communities form on their own accord, there remains some limitations in developing 'e-communities of knowledge' for research. Using such communities as spaces for educating learners and as a common area to engage in research are expensive to launch and maintain. In order to develop diverse e-communities to support, connect, sustain, and grow various academic fields, MEHRD should aim to provide active support through organizations such as Korea Research Foundation or various science foundations. The ideal would be to provide extensive support for interdisciplinary fields to carry out mutual projects or in fields that are well suited to perform collaborative research using the Internet. Another consideration is that academic databases housed on 'e-communities of knowledge' (i.e., content developed by both faculty and researchers in the field and industry) should be compiled to provide direct and indirect help to undergraduate and graduate students. Furthermore, such online content should keep in mind students' learning outcomes, as well as academic activities. By strategically managing the process of e-community development, momentum can be built for faculty and researchers to help them help themselves through the production of new types of knowledge.

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Impact of ICTs on Open and Distance Learning in a Developing Country Setting: The Philippine experience

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Abstract

The influence of the information and communication technologies (ICTs) in open and distance learning (ODL) in a developing country, the Philippines, is critically evaluated in this paper. Specifically, this paper examines how ICTs have influenced or shaped the development of ODL in this country. Also examined are the different stages or generations of distance education (DE) in the Philippines, which are characterized mainly by the dominant technology used for the delivery of instructional content and student support services. The different ICTs being used in ODL and their specific applications to the various facets of this mode of delivery are also described. Also included is an examination on how quality of education is ensured in a technology-driven system of teaching and learning, which includes, among others, the employment of the ‘quality circle approach’ in the development of courses and learning packages, and the provision of appropriate technologies to perform academic processes and achieve institutional goals. Experiences of the various universities in the Philippines are also cited in this paper. Lessons have been drawn from the ODL experience to guide educators from other developing countries.

Keywords: Open and distance learning; distance education; digital divide; information and communication technologies; developing countries; Philippines; SMS; mobile phone; mobile learning; ubiquitous learning; e-learning

Introduction

In a developing country like the Philippines where the ‘digital divide’ is more the rule than the exception, delivering instruction through the distance mode presents a significant challenge to educators. In a nation where the concern of most people is meeting their basic need for food, clothing, and shelter, access to information and communication technologies (ICT), especially the most modern ones, is very low on their list of priorities – and oftentimes, not considered a priority at all.

Nonetheless, ICT has had a major impact on open and distance learning (ODL) in the Philippines. More than the availability of these technologies, issues such as geographical location, lack of knowledge and skills to use ICT, and financial constraints, are major considerations in deciding what ICT to use and in what combination. Indeed, the use of a particular ICT must not only

address certain pedagogical concerns, it must aim to bridge the digital divide and democratize access to quality education.

Experience has shown that when a decision has been made to use a technology in ODL, this decision influences not only the teaching and learning environment, it leads to the development of new cultures, concepts, and understanding. Put simply, the introduction of ICT can alter and raise expectation among users and institutions alike.

This paper discusses how ICT influenced the development and implementation of ODL in the Philippines. It also describes specific ICT and their applications in ODL, and evaluates the overall influence of ICT within ODL contexts in the Philippines.

Development of ODL and e-Learning in the Philippines

ODL and e-Learning in the Philippines had undergone major transformation in both form and content. More than five decades has witnessed major phases or stages of ODL development, based on the dominant technology in use at the time. Just like any other evolutionary process, it is very hard to definitively identify the end or beginning points of specific stages, as use of older with newer DE technologies tend to overlap and blur the boundaries. Nonetheless, the main concern has always been the pedagogy used, and not the technology itself per say. As such, one can view the development of DE in the Philippines as simply another ‘classic case of necessity,’ wherein educators experimented and explored various forms of ICT alone or in convergence with other more established forms of delivery to address pressing societal concerns and achieve academic and institutional goals.

The development of ODL in the Philippines has undergone four general stages or generations. Unlike other countries, the root of ODL in the Philippines was not print, nor even correspondence. On the contrary, radio was the first ODL instrument. Early ODL in the Philippines – which were radio programs designed, developed, and implemented by Filipinos for the Filipino people – consisted of informal, non-credit courses offered in the area of agriculture.

First generation of DE in the Philippines

The earliest documented effort of ODL in the Philippines was the Farmers’ School-on-the-Air (FSA). The first FSA was aired in 1952 in the province of Iloilo, over a one-kilowatt radio station (Tan, 1971, as cited by Flor, 1995). A program entitled Tips on Farming and Community Development, which was broadcast in 1952 over a period of six months, served approximately 150 students scattered throughout the province.

The FSA-format was adopted by other radio stations and government agencies who aimed to teach different segments of Filipino society lessons they deemed necessary to improve Filipinos’ standard of living. A sustained use of radio for instruction in the schools-on-the-air (SOA) format was accomplished by DZLB, a radio station managed by the University of the Philippines Los Banos (UPLB), which itself was a constituent unit of the University of the Philippines (UP), the nation’s premiere university. Lessons, which aimed to educate farmers, out-of-school youths, housewives, and others living in rural areas were aired starting in 1967. To date, DZLB has aired more than 32 SOA topics and has graduated over 14,000 students in this mode of learning (Flor, 1995).

The non-formal courses delivered through FSAs/ SOAs was the forerunner of modern distance education in the Philippines. As such, radio can be viewed as the First Generation DE in the Philippines.

Second generation of DE in the Philippines

Recognizing the potential of DE for continuing education of various professional groups, many traditional universities started offering their graduate degree programs via DE methods, which relied mostly on print-based instructional materials supplemented with occasional face-to-face tutorials facilitated by a university-trained tutor. This is the Second Generation Distance Education. In this second generation, lessons were typically contained in a set of print-based learning materials supplemented by face-to-face tutorials. However, these tutorials evolved to be more a venue for academic consultations and clarifications about the lessons, than covering the subject matter itself. As such, these regularly scheduled face-to-face meetings served as a:

- Formally scheduled consultation between the students and the university
- Place for students to undertake various transactions with the university
- Venue for socialization with fellow DE students

In essence, DE face-to-face tutorials had evolved into an informal system of ‘student support,’ and not a forum for the actual delivery of instructional content per say. Moreover, these ‘tutorials’ were never deemed compulsory; it was up to the student to decide for themselves whether to participate or not.

In the case of the University of the Philippines’ Open University, its second generation DE was supplemented with ‘radio’ to deliver instructional content, which in itself is evidence of the overlapping practice left over from first generation DE. Experiments and initiatives on the use of television to supplement print materials also took place during the second generation of DE development in the Philippines, again showing that these generations are not so clear-cut and easy to define.

Third generation of DE in the Philippines

The third generation of DE in the Philippines saw the convergence of several key factors: 1) growing need for flexible learning, anytime, anywhere; 2) increased availability and access to new ICT; and 3) growing demand of geographically dispersed professional groups seeking access to flexible, lifelong learning opportunities. To address these emerging societal demands, instructional contents were primarily delivered in print-based formats (where instructional design is essential), supplemented with lesson components typically delivered in convenient audio and/or video formats.

The need to explore alternative methods of delivering DE educational opportunities, however, soon became necessary, particularly when various professional groups in the Philippines were soon demanding flexibly delivered, full degree programs. However, because the Philippines is actually a country comprised of 7,107 islands, many Filipino learners cannot easily access universities main campuses and, in many instances, even their satellite campuses and learning centers. Moreover, most potential students work full time and must juggle family responsibilities

in addition. As such, many Filipinos are not in a position to attend regularly scheduled classes during regular hours. Clearly, this growing demand for DE had to be met, because with without it, many Filipinos would simply be turned away. To overcome logistics of travel, DE enhanced with ICT for delivery of information rich learning opportunities, became an option. However, this reality put many universities in a financial quandary: they either stayed as they are, and lose this potential body of student, or they had to scrape up enough money to invest in ICT needed to serve these large, yet remote student populations. Thus, third generation DE can be defined as an stage in which Filipino educational providers sought to incorporate ICTs to support their students studying at a distance. As such, the third generation of DE saw the introduction of online tutorials that aimed to help learners. Teleconferences, facilitated by one tutor, became the primary mode of DE delivery for this type of interaction between students and teachers.

It should be noted, even in the third generation, universities' learning centers continued to play an important role in delivery of various administrative and pedagogical processes, such as enrollment, places where face-to-face tutorials were held, and other types of administrative support. In sum, university learning centers continued to serve as the DE institution's physical presence in various areas, centralized buildings wherein students could avail themselves of services they expected from their university.

Fourth generation of DE in the Philippines

Fourth generation DE can be aptly described using terms e-Learning (electronic learning), m-Learning (mobile learning), and u-Learning (ubiquitous learning). The fourth generation can also be viewed as an 'empowered phase.' For teachers, the use of ICTs helped enhance their skills and knowledge. For students, use of ICTs enabled them to assert more control over their learning environment, specifically the 'how,' the 'when,' and the 'where,' and sometimes even the 'what' they will learn. Both students and teachers now have more flexibility to shape and structure their learning/ teaching environment to take full advantage of fellow participants' prior experiences. This dynamic of 'sharing prior knowledge and skills and contextualizing within the course materials' makes the educational experience far richer and more conducive to critical and higher-order thinking.

University learning centers' have also been transformed during the fourth generation of DE in the Philippines. Learning centers have become somewhat redundant, often viewed as a 'fall-back option' for administrative processes like registration, which are also offered online, 24/7. The major functions of the university learning centers, therefore, have been scaled back to being mere 'testing centers,' course materials distribution and pick-up points, a place for submitting assignments in hard copy, and submission centers of course requirements. In point form, the events that ushered in this current, fourth generation of DE in the Philippines are:

1. Increasing numbers of students found it impractical to use the conventional system of doing DE. Instead, they now use ICTs to supplement their new, independent, student-centered learning styles.
2. More and more professionals in the Philippines found it necessary to upgrade their skills and knowledge to remain competitive. Earlier generations of DE, however, did not serve them well. Use of ICT now allow universities to reach many lifelong learners from the professional ranks at a distance, including many learners living outside the Philippines.

3. The proliferation of Internet cafés has dramatically increased access throughout the Philippines. Indeed, the reality is that telephone lines are still not available to the majority of Filipinos, so many cannot access the Internet from home or even their offices. Internet cafés, therefore, have become a lucrative business that addresses growing demand for Internet access across the Philippines. As such, there has been an explosion of Internet cafés, particularly in urban areas. Competition among these small businesses is fierce and as a result, prices have dropped. Today, Internet cafés serve as venues for DE students who seek to access their online course materials or virtual classrooms.
4. The availability of hardware and software technologies, such as threaded discussion groups, RSS feeds, bulletin boards, online project submissions and quizzes, chats, Web-browsing and safaris, and access to the World Wide Web, has extended the learning environment beyond the traditional brick and mortar campuses. And as prices drop for ICT, and as increased affordability of DE prevails through economies of scale, online teaching and learning will become increasingly feasible for large segments of the Filipino population seeking to access the personal, social, and economic benefits of lifelong learning.

So, while each successive generation of DE and ODL can be seen to be shaped by the primary technology used to deliver instructional content and learner support services at that particular point in time, several new questions must be asked as we view the dawn of the fourth generation of DE in the Philippines. Does the use of ICTs ensure that all Filipinos have access? Is the use of ICTs putting some Filipinos at a disadvantage?

ICTs and ICT Applications in ODL in the Philippines

ICTs used to support ODL can be classified into two main categories, the first being hardware and second being, software. The hardware currently in use are roughly the same among all Filipino institutions: radio, television, telephone (land, mobile, fax, Voice over Internet Protocol or VoIP), and computers. ICTs have now converged thanks to recent advances and enhancements made to the infrastructure, such as the laying of fiber optic cables and satellite and microwave transmission facilities. What differ, however, are the levels of use and applications of specific hardware technologies and purpose driving their use.

Much variation can be observed in the ICT software components needed to support fourth generation DE. Such DE software tends to be customized to address variables such as: specific applications or purpose for which it will be used; the combination of hardware used to support DE applications; and features that need to be incorporated to meet users' needs. Customized forms of software is typically evident in the form of learning management systems (LMS) that are used to simulate classroom settings and facilitate academic discussions/ interactions. LMS are often meshed with other, pre-existing technologies such as databases and digital libraries.

Thus, various forms of LMS and their related hard- and software-components necessitates the formulation of appropriate policies, processes, and procedures that must align with preexisting policies, processes, and procedures – all of which must work in concert to support the smooth operation of the technology.

Use of ICT hardware has been greatly influenced by two factors: 1) access, and 2) cost of access. Access to ICTs can be viewed along two sub-factors: 1) physical access to the technology, and 2) pre-requisite skills one needs to use this technology effectively. One key indicator of 'physical

access' in the Philippines is the level or rate of ownership. For example, most Filipino households and businesses own a radio, television, audiocassette, and/ or VHS/ VCD/ DVD player. Indeed, such technologies are very common. Moreover, because very little skill is required to operate these technologies, their use is only limited by the cost of the hardware itself and electricity needed to power it.

On the other hand, access to the Internet is determined by several sub-factors: 1) the physical access which, 2) is determined by the availability of the computer hardware and telephone; and 3) the skills needed to use the computer and access the Internet. The good news is that computer ownership in the Philippines is rapidly increasing. However, significant improvements must be made in the Philippines' telephone infrastructure before these computers can really be said to be 'connected' (i.e., installation of fiber optic cables, microwave transmissions and submarine cables to reach the 7,107 islands). Put simply, the landline telephone infrastructure in the Philippines is not very robust, and as a result, few Filipinos can access telephone services. Moreover, in recent years the landline telephone infrastructure in the Philippines has actually been in decline (Tibay, 2004). Some suggest that this decline can likely be attributed to the introduction of cellular mobile telephones, which are more affordable, accessible, practical, and hence, ubiquitous. So, even though there has been a marked decline in the Philippine's landline telephone infrastructure, there has been a marked increase in the number of registered Internet Service Providers in the Philippines' larger cities (Tibay, 2004). Again, this is manifest in the rapid proliferation of Internet cafés, which are helping to narrow the digital divide.

According to an article published in the Metropolitan Times (31, December, 2003) the main Internet access points for younger Filipinos are Internet cafés, while, the main access points for older Filipinos (age 30-60) are their offices and homes. Main purpose for 'Internet access' was for business (50%), followed by personal use (41%). The most popular Internet activity is sending and receiving email, followed by surfing/ browsing, chatting, and file download (Metropolitan Times, 31 December 2003). There was no mention of 'education' at all in this article, which in itself implies the recent emergence of e-Learning in the Philippines as a very new, alternative method of educational delivery.

Cellular mobile telephone use in the Philippines has enjoyed phenomenal growth. The number of cell phone subscribers has exploded. As a result, the Philippines has since been called the short messaging service (SMS) capital of the world, with SMS becoming an integral part in the Filipinos' communicative lifestyle. There are now more mobile phone subscribers, than fixed-landline telephone subscribers in the Philippines. By the dawn of 2006, the Philippines had 40 million mobile phone subscribers – six times more than in the year 2000 (The Communication Initiatives, *n.d.*).

Given the proliferation of cellular mobile telephone use across all sectors of Filipino society, it is becoming increasingly evident that this highly mobile form of technology and its infrastructure can be leveraged to deliver flexible educational opportunities to more and more Filipinos. In other words, simple, low-cost cellular mobile telephones are now helping Filipinos bridge the once formidable digital divide.

There are wide variations in ICT used in ODL institutions around the world. Further, specific applications and combinations of these applications are very much shaped by the context of their target user populations. In the Philippines, the various ways and means in which ICTs are used include:

Delivering instructional content

Depending on learner needs and appropriate pedagogy, instructional contents are packaged in various formats using different media. As mentioned, the development of ODL in the Philippines witnessed instructional packages delivered in print, audiotapes, videotapes, and CD-ROMs. In recent years, going online has made Web-enhanced teaching and learning possible, using rich online resources to supplement and update instructional materials.

To take advantage of high cellular phone use in the Philippines, various initiatives are underway to make use of mobile technologies for education. One such initiative is the University of the Philippines' Open University m-Learning program, launched in 2004. Using a combination of print and mobile materials, UP offered:

From Head to Toe: Body Idioms, a lesson about common idiomatic expressions using the different parts of the body and their meaning

Mental Math, a lesson about simple mathematical operations involving the calculation of large numbers without need of a calculator, pen, or paper

Eating Matters, a lesson on proper nutrition

Lifestyle Check, which offers tips on how to live a healthy lifestyle

Correct Spelling, a lesson on commonly misspelled words

Let's Get Physical, a lesson on exercise to stay fit and healthy

These pilot lesson topics were selected, because they are universally relevant and can benefit all Filipinos, and because they do not culminate in a final examination that could impact students' grades.

Other academic institutions, however, have explored the potential of mobile devices such as cell phones for education purposes. These initiatives tend to be geared towards the augmenting their traditional face-to-face instructional offerings. Such is the case of the text2teach project of the Department of Education, which integrates digital satellite broadcasts and mobile phone communications, to deliver science materials via video broadcast directly from the classroom (Domingo, 2006). The Advanced Science and Technology Institute of the Department of Science and Technology has also been experimenting with *Bluetooth* technology to connect various personal devices in close proximity to each other. Such research and development initiatives are now leading to new and potential avenues of further research, which educators must explore in their quest to provide learners with more innovative and practical methods of delivering education at a distance. However, while there is clearly potential for mobile devices (such as cell phones), some limitations do exist. Mobile phones can only handle so much information, particularly given that capacity of mobile phone models currently in use. The level and cost of synchronous interactions is also a factor, which can be prohibitive for some potential students. In sum, although the use of cell phones is ubiquitous in the Philippines, using cellular technology for mobile learning does have limitations, which must both be recognized and dealt with accordingly.

Delivering Support Services to DE Learners

The success of DE learners depends on the various support services available to them. Moreover, the delivery of student support services must be congruent with the mode of delivering instructional content. Support services like tutorials, library, guidance and counseling, and academic and administrative consultations, must be available in a wide variety of forms, such as online and via SMS. This is very important because many Filipinos do not have easy and ready access to the Internet. As mentioned, cellular phone technology is proving to be an indispensable tool. For instance, SMS can be used for vital communications, such as alerting students that their course materials are ready and that they must make the effort to download these materials from the university website (i.e., from an Internet café).

Communication between and among students can also be facilitated by mobile phone technology. Use of cellular phones can facilitate ‘cohort socialization’ or can serve as a support mechanism to encourage students along in their DE studies. Socialization via cell phones can provide that much needed thwart feelings of isolation, and promote their ‘sense of belonging,’ psycho-social aspects that were typically missing in older generations of DE.

Research and Development Work

Research and development is integral to the informed use of ICT for education. However, aside from being the subject of research itself, ICTs can also be used to gather much needed data on geographically distributed subjects such as students, university staff in the learning centers, etc. Put simply, surveys are now being conducted online, via email, via online interviews using VOIP or Skype or other forms of audio and videoconferencing. Collecting and analyzing data is also being automated using appropriate software for data analysis. Survey questionnaires can be downloaded and submitted online and tabulation of data gathered can be automatically integrated and analyzed with statistical software.

Performing Management and Administration Functions

ICT has influenced the delivery of instructional content and student support services and has transformed the management of DE institutions. Although most are online, many ODL universities choose to maintain their physical presence locally and internationally. Such ‘physical presence’ is typically manifest in their learning and testing centers. Use of ICT has clearly become central in facilitating and coordinating communication and activities between and among ODL institutions’ widely dispersed service and academic units. Indeed, specific applications to facilitate administrative processes underway in ODL institutions in the Philippines include:

Document Tracking System (DTS) for application for admission

Through this DTS system, students can submit their applications online, receive acknowledgement of receipt, track the progress of their application, and receive results of their evaluation online. Moreover, because much of these administrative processes are now fully automated, students have access to more efficient, cost-effective services. Currently, UP is conducting research and development on the use of mobile phones for these processes.

Online registration system

The online registration system allows the student to enroll in courses at their own convenience, typically during the prescribed registration period. A parallel, traditional registration system is also available for those who do not have access to the Internet or do not own a cell phone.

Online submission of grades

The online grades submission system enables instructors to submit students' grades online. This system is especially useful for adjunct UP faculty members who work external to UP. Online access to official student enrolment lists are also available, where instructors can post students' interim and final grades for immediate release to students.

Digitization of student records

Many universities are now using digital student records. Indeed, a typical student accumulates a variety of records over his or her academic lifetime. Clearly, the storage of physical records not only takes up a lot of space, it can take a lot of time and effort, not to mention lead to nightmares as one seeks to retrieving archived student files.

Orientation of new/ incoming Students

In a DE system, especially in the Philippines wherein many learners consider themselves to be semi-literate and have not been formally exposed to the DE culture of 'independent learning,' student orientation sessions have become imperative for student induction into DE and its process. For instance, orientation activities are required to inform students about course prerequisites, course outlines, procedures for adding and withdrawing from classes, grading criteria, tips on where to access study materials, and so forth. The fact that many students live far away from main and satellite campuses, however, makes it very impractical – if not impossible – to gather them physically all in one location for orientation. The creative use of low-cost, readily available technologies like *Yahoo Messenger* for instance, has helped DE providers overcome obstacles of time and space and levels of synchronous communication and interaction necessary to conduct viable orientation sessions.

Extend the culture of discussion and debate to enhance critical and higher order thinking

Discussions and debates are central in the development of critical- and higher-order thinking skills, especially among graduate students. In the case of the University of the Philippines, its established culture of 'discussion and debate' should ideally be extended to its DE students. To support debate and discussion among its DE and traditional students, UP's physical classrooms can be linked to its DE students using low-cost, widely available technologies such as *Skype*, *Yahoo Messenger*, and so forth. These same technologies can also be used for 'enrichment activities,' such as chat and discussion sessions with subject matter experts.

Enculturation and Promotion

In the Philippines, DE is often still perceived as a second-class form of education. This is likely because almost everyone involved in DE, either closely or on the periphery, is somehow a product of the conventional educational system. As such, many Filipinos – albeit wrongly – perceive DE to be nothing more than ‘correspondence school.’ Because most Filipinos lack of correct information on DE, their misguided perceptions contributes to a generalized reification of misguided perceptions across all levels of Filipino society. Disseminating fully informed, research-based evidence about the benefits of DE can help correct this misperception. Put simply, broader and more targeted dissemination of DE research results can help to,

- Rally policy makers and resource providers to support DE
- Enhances DE’s credibility in the eyes of industry and other groups whose personnel may benefit from DE, or conversely, may hire graduates of DE programs
- Secure funding for academic institutions seeking to use DE modalities to reach student populations previously unattainable

Given that most academic institutions have finite financial resources, however, money needed to promote, support, and sustain DE enculturation is simply not there or must be shared. Put simply, DE often must take the backseat and remains last on a long list of pressing priorities. As a result, many institutions must share their limited resources to promote their DE offerings. Currently, most DE promotional activities take place online via universities’ main websites, homepages dedicated to its DE faculty, publishing and making DE research papers available, publishing e-New stories on DE, SMS broadcasts, etc. As a result, ICTs have been helpful in getting the message out there, helpful in DE ‘image building.’ In short, use of ICT ensures the greater likelihood of DE reaching its target market, specifically those seeking flexible certificate, degree, and non-degree programs delivered at a distance.

Ensuring Quality Education in a Technology-Driven Mode of Learning

Quality of DE has always been contentious. Detractors of distance education, somehow equate quality of DE with that of physical face-to-face traditional education in the classrooms. This viewpoint, however, is like comparing apples to oranges – both are fruit, but both are very different. Nonetheless, perceptions need to be based on reality. This means it is necessary to employ the ‘quality circle’ approach in developing DE courses and learning materials. The ‘quality circle’ consists of the course writer (who is a subject matter expert), a subject matter specialist (another subject matter expert who peer reviews the soundness of the course and its contents), an instructional designer (who ensures the ‘chunking of lessons’ is appropriate and that the program/ course goals, contents, and assessments mesh logically with one another), a media specialist (who recommends appropriate delivery mediums), a language editor (who performs copy and substantive editing). In sum, whatever the technology used to deliver instructional content, the ‘quality circle approach’ to course development should be standard practice.

Educational providers must strive to use quality and reliable ICT hardware (connections should be available, 24/7) and software (i.e., the LMS). Just as important, these systems must be supported by highly skilled individuals, armed with the knowledge and skills they need to ensure hard and software runs smoothly. To accomplish the human aspect of ICT, institutions must offer training to various user groups (i.e., students, teachers, administrators, etc.). Offering such

training helps to ensure the efficient and effective use of ICT for all stages of the teaching and learning process, from accessing online classrooms, to course registration, to managing digital library materials, to manipulating databases to get the information one needs to do their work or complete an assignment . . . and so forth.

Unfortunately, the common perception among many Filipinos is that DE is an easy way to get a degree. DE, as such, is often seen as a diploma mill. ODL institutions must therefore strive to maintain very high quality standards (i.e., maintaining entrance standards, grading standards, course/program completion standards, and conferment of recognized degrees, etc.). Put simply, institutions offering DE must strictly adhere to the highest standards in terms of setting academic policies and procedures to ensure the integrity of the degrees they confer.

Impact of ICT on ODL in the Philippines

The influence of ICT on open and distance learning in the Philippines is manifest in many forms. For example, the evolution or development of ODL in the Philippines has clearly been shaped by the use of ICT. Each successive DE generation has been shaped by the dominant technology in use at that particular point in time. As such, adoption and integration of ICT into DE has resulted in new models of learning like m-learning, e-learning, and u-learning.

Education in general has been transformed by the use of ICT. Experts are now talking about the ‘School of the Future’ (Taylor & Hogenbirk, 2001), which must grapple with the ever changing needs of Filipinos’ increasingly inter-connected, globalized, information-based society. ICT is instrumental in facilitating the shift from “learning as a personal achievement to learning as a result of a global social process” (Taylor & Hogenbirk, 2001).

The technology used to deliver instructional content has influenced instructional design methods used. While the pedagogy has always been the central consideration, the delivery characteristics of the technology used is also on the minds of instructional designers charged with designing pedagogically sound DE learning materials. The ‘chunking of lessons,’ for instance, and the level at which learners should interact with the course contents are major design considerations – considerations which must fit both the content AND the attributes of the technology. Depending on the technology used, the interaction by which to engage learners will vary. Loveless and Ellis (2001), for example, advise that “it is not enough to use technology to do the same types of activities; educators must also consider the new ways of thinking that the technology affords” (page number for direct quotes please). This means educators must think about pedagogy and ICT from within a systems perspective – not as discrete variables independent from one another.

ICT in use in ODL is also re-shaping universities’ entire organizational structures. Westbrook (2001), for example, observed that the introduction of ICTs in education has resulted in the changes in four core areas: 1) curriculum; 2) role of teacher and students; 3) organizational structure; and 4) learning environment. Given that a growing number of transactions now take place online at a distance, appropriately automated systems for recording these transactions, tracking them, keeping and retrieving student records, and so forth, must be supported by holistic policies and procedures that take into account all academic-related activities.

Librero (2006) observed that conventional universities are now using ICTs to achieve ‘blended learning’ environments, which blend traditional face-to-face classroom delivery with distance delivery. This blended approach has “increased the sources of learning materials that learners must access under blended learning strategies” (Librero, 2006).

Librero (2006) also noted the changing image of universities as a result incorporating ICT into its educational offerings, a term he calls ‘corporatization’ (sic). Universities are starting to think and operate like businesses; they are ever seeking to take advantage of emerging opportunities to ‘earn lots of money’ via online learning.

Use of ICT is also reshaping university cultures. A school’s culture is defined by its pattern of relationships and of management of resources. These patterns of relationships and methods of management are, in turn, shaped by its overarching educational philosophy, expectations from the community it serves, its moral culture, political skills of its leadership, and curriculum (Azinian, 2001). In recent years, the culture of teaching has shifted from that of being the ‘sage on center stage,’ to that of being a learned facilitator, a dynamic called ‘learner-centered’ pedagogy. Garcia (2002) for example, observed that “online tutors have greater responsibility to ensure that all voices are recognized and respected and must consider all opinions when integrating messages or making concluding statements”. Rapatan (2002) further notes that teachers must aim to be “literate in the new technologies and retrain themselves in pedagogy for them to understand how to make technology support conceptual formation and change in students”.

Clearly, the culture of learning has shifted from the culture of students passively listening in a classroom where attendance matters, to the culture of proactive reading, encoding and decoding anytime, anywhere. Garcia (2002) also observed that online discussion has had a democratizing effect on the learning process, a dynamic referred to as an “egalitarian environment” (Brown, 1997, as cited in Garcia, 2002). In an online learning environment, adult learners must take greater responsibility over their own learning paths by sharing their vast array of experiences and knowledge with others in their class.

School administrators must also make the effort to redirect and lead their organization as a “learning organization and review and articulate new performance standards” (Rapatan, 2002).

The growth of ICT in education has given rise to new concepts and realities that are only now becoming mainstream. The concept of ‘socialization’ in DE settings, for instance, is often technology-mediated and for many students, the only mode of socialization available to them. Time and space ceased to matter in terms of social and transactional distances. The concept of the ‘teacher’ has fundamentally challenged to include various elements like tutors, LMSs, technical support, learning packages – all further evidence of ICTs influence in education.

Lessons Learned

First, those seeking to deploy DE must ensure that any technology used is both pedagogically sound and socially-driven. In other words, it is not wise to use technology simply for technology sake, it must be ‘relevant.’

‘Relevance’ in this case has two dimensions: the first is process and the second is substance. Kling (2001) asserts that design and implementation processes must be relevant to the actual social dynamics of a given site of social practice, and that the substance of design and implementation – specifically the actual designs and the actual systems – must be relevant to the lives of the people in which they affect. Kling also said:

Technical work, more superficially, should draw attention to functionalities that people value and more fundamentally, should articulate those analytical categories that have been found useful in describing social reality.

The cost will always be a consideration, however. A fact that has been implied by Bates (2000) who advised that institutions must comprehend the costs of using new technologies. These costs not only must cover the purchase of the technology (e.g., hardware and software) it must cover the cost of training staff so they can acquire the needed skills and knowledge to use the new technologies effectively, or if that is not feasible, securing funds to hire additional staff that possess the needed skills and knowledge.

Access and cost of access must be attainable and affordable for students. While universities can always find ways to make DE technologies available to its staff and personnel, students must also be considered in the costing equation of 'access'. The cost using ICT, such as the cost of Internet access, cost of sending SMS, or cost of the mobile telephone itself, must be considered when selecting technologies to support DE. Another consideration is that those using this technology should ideally have the skills and knowledge necessary to use the technology effectively.

Partnerships and collaboration are strategies that can work to reduce costs associated with DE. Resources tend to be limited and few institutions of higher education have everything they need to implement quality DE. For instance, there may be cases when the R&D associated with the development of DE projects is best shared across two or more universities. Moreover, as technologies converge, organizations must respond with common goals and objectives. In this context, collaborations can reduce costs associated with designing and implementing commonly used DE platforms and courses (i.e., sharing of reusable learning objects housed in a common repository). Moreover, collaborations often serve as an enriching learning experience for all involved, such as was the case of UP Open University's collaboration with the University of Singapore to in the design of the Integrated Virtual Learning Environment. UP Open University has similarly collaborated with other governmental institutions for the provision of alternate, back-up forms of Internet connectivity.

Implementation of new teaching and learning strategies also requires attendant changes in organizational structures, such as new units and/ or integration of existing units dedicated to the production of DE learning materials. Such changes in organizational structure, however, must be supported by revised policies and procedures that takes into account all units, both old and new, involved.

Research and evaluation is important. As with any new initiative, the research component of DE projects must inform the selection and subsequent use of any new technology. Projects, therefore, must set goals, means to meet those goals, which must be monitored to ensure their effectiveness and efficiency in meeting those goals.

Introducing innovations always have cost implications. UP's Open University, like most universities, has limited resources upon which to research, design, implement, and support DE. Moreover, any innovation – including DE – has a corresponding cost on some other part of the organization. Often there is simply not enough money to go around. As such, organizations like UP's Open University must beware of reinventing the wheel (i.e., embarking on costly, custom designed systems) and instead seek to creatively use technologies that are already readily available.

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The Practice of a Quality Assurance System in Open and Distance Learning: A case study at Universitas Terbuka Indonesia (The Indonesia Open University)

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Abstract

Quality assurance for distance higher education is one of the main concerns among institutions and stakeholders today. This paper examines the experiences of Universitas Terbuka (UT), which has initiated and implemented an innovative strategy of quality assurance (QA) for continuous improvement. The credo of the UT quality assurance system is "We write what we do. We do what we write. We check. We improve continuously!" Implementing a quality management system at the UT, a mega-university with a student body of more than a quarter of a million and which involved a network of participating institutions and regional centres, was a formidable task to accomplish. To achieve its lofty goal, UT adopted and contextualised the draft of the Asian Association of Open Universities (AAOU) QA Framework to launch its own quality assurance program. This has taken a great deal of commitment and participation of all staff involved. QA at the UT required systematic and step-by-step processes, including development of the QA framework and job manuals, raising awareness and commitment amongst all staff involved, internal assessment, and integration of QA programs into the university's annual action plans, external assessment and benchmarking. This paper concludes that quality assurance must be developed as institutional policy and strategy for continuous improvement.

Keywords: Quality assurance; continuous improvement; quality management; distance higher education; open university

Introduction

Over the past few years, there has been significant growth of quality assurance (QA) activities aimed towards improving higher education on institutional, national, regional, and global levels. Public and institutional stakeholders seeking accountability in higher education have encouraged governments to establish national quality assurance and accreditation agencies. Agencies, such as European Network of Quality Assurance (ENQA), International Network of Quality Assurance Agencies for Higher Education (INQAAHE), and the United Nations Educational, Scientific and Cultural Organization (UNESCO), typically work together and share information about quality standards, benchmarks and best practices. A number of terminologies have been developed and used to refer to similar ideas of improving the quality of higher education, such as quality

assurance, quality assessment, quality improvement, and quality development (Harman, 2000; Brennan & Shah, 2000; Hopkin & Lee, 2001; Gosling & D'Andrea, 2001). However, while the definition of quality assurance may differ, all quality assurance terminology shares a common purpose in ensuring that students receive a high quality and relevant education and awarded credentials that are widely recognized by governments and employers.

Quality assurance has been defined as "systematic management and assessment procedures adopted by higher education institutions and systems in order to monitor performance against objectives, and to ensure achievement of quality outputs and quality improvements" (Harman, 2000, p. 1). Quality assurance facilitates recognition of the standards of awards, serves public accountability purposes, helps inform student choice, contributes to improved teaching learning and administrative processes, and helps disseminate best practices with the goal of leading to overall improvement of higher education systems. Setting common standards and evaluation criteria, however, must take into account diversity and plurality of higher education within national, as well as regional systems. Higher education institutions are challenged to develop new visions, new forms of collaboration across institutions and nations (Harman, 2000). Brennan and Shah (2000) use the term 'quality assessment,' whose common methods and elements include 1) a national coordinating body; 2) institutional self-evaluation; 3) external evaluation by academic peers; and 4) published reports. They further identify four main types of "quality values" they determine to underpin different approaches to quality assurance: academic, managerial, pedagogic, and employment focus.

In general, the term QA refers to a process of defining and fulfilling a set of quality standards consistently and continuously with the goal of satisfying all consumers, producers, and the other stakeholders. In engineering and manufacturing, for example, 'quality control' or 'quality assurance' is viewed as a set of measures undertaken to ensure that defective products or services are not made – typically under the credo 'do it right the first time' – and that the design meets the product or service meets predetermined performance requirements. It includes the regulation of the quality of raw materials, assemblies, products and components; services related to production; and management, production, and inspection processes. QA programs typically include peer or utilization review procedures to remedy any identified deficiencies in quality (Wikipedia, n.d.).

In the context of education, 'quality' has been placed high on the agenda of educational leaders, policy makers, and practitioners, and is in line with consumers' ever increasing demand for quality education. In many countries, stakeholders have been placing high expectations on their educational systems, compelling institutions to produce higher quality products, services, processes, and by extension, students and graduates. Governments have also been seeking increased levels of accountability from their publicly funded educational institutions. Faced with the globalization of the world economy, coupled with associated challenges of producing high-caliber human resources needed to effectively participate in the global economy, national stakeholders have voiced serious concerns about the 'quality' of their educational provisions to ensure their competitiveness. Thus, it is clearly imperative that educational institutions continuously improve the quality of their educational provision (UT, 2002).

Quality Assurance in Open and Distance Learning

Quality has always been an issue in distance education (DE) and distance learning (DL). Since DE's inception and subsequent widespread diffusion, DE has been increasing access to education, a reality that has compelled many countries to adopt DE as part of their educational system (Garrison, 1993). Further, this paradigm of 'access to education' is in line with the belief of

student autonomy and independence, as students studying at a distance often do so alone (Moore, 1993).

As societies evolve from the post-industrial era to the information age, DE has also been similarly evolving. As a result, concerns about the quality of DE provisions have been of central importance and subject to study. For instance, interactive communication between and among students and tutors is now being emphasized (Belawati, 1999). It is within this 'access to education' paradigm that 'quality assurance' has become one of the fundamental aspects in planning and managing open and distance learning (ODL) provisions.

Since the 1990s, quality assurance in distance and higher education has gained serious attention by institutions, stakeholders, and scholars. In response to QA line of inquiry, institutions have begun to re-define and re-orient their institutional missions and strategic visions to incorporate and address quality issues. QA has now reached an important turning point and is influencing DE institution's management strategies and cultures. Numerous reports have been published to share ideas, experiences, and articulate the 'how and how not to' and 'best practices' of QA implementation in DE contexts from around the world (Deshpande & Mugridge, 1994; Tait, 1997).

Stakeholders interested in ODL have become increasingly interested in quality assurance issues. Learners are demanding better quality educational services and provisions. This means ODL providers must pay close attention to quality in terms of products, processes, production, delivery systems, and philosophy (COL, 1997). The 'total quality approach,' which covers not only products but services and processes as well, is a very useful methodology that holistically examines the process of ODL as an integrated whole (Zuhairi, Purwanto & Isman, 2002).

Quality improvement becomes imperative for ODL providers, and governments have established quality agencies to improve the quality of educational practice. Pressures for quality improvement have emerged from both internal and external parties. Internally, ODL institutions are being challenged to undertake continuous improvement from within. Externally, stakeholders (i.e., users, consumers, educational funders) are persistently questioning the quality, accountability, effectiveness and efficiency of educational endeavors in which they have interest. Moreover, for many ODL institutions funding and student enrollment levels depend on quality of their bottom line performance and the quality of the services they offer.

Despite the importance of the process component as a whole, 'quality' in ODL tends to be viewed in terms of 'materials' produced. Judging the quality of ODL products is relatively easy, however. The course materials, which are often the primary means of engaging learners, are tangible and open to scrutiny by students and other interested parties. Indeed, it is much easier to judge the quality of a tangible product of say, a course syllabus and curriculum, than of less tangible aspects such as learning process, teamwork, or management (COL, 1997). Clearly, quality in ODL covers a number of aspects, which along with the physical products, includes pedagogical processes, production and delivery systems, and philosophy (COL, 1997). Quality of products includes course materials, number of graduates, examination pass rates, admission in further studies, and so forth. Quality of processes covers areas such as learning and teaching processes, advising students, coordinating external course and test item writers, networking with regional offices, managing student information. Quality of production and delivery systems includes course production, print and multimedia production, test item production, scheduling, warehousing and stock control, getting materials to students, and broadcast transmissions. Quality

of philosophy covers such things as ODL vision, mission and policy statements, institutional culture, governance, corporate culture, and public image (COL, 1997).

In terms of products, the quality of ODL varies from one institution to another, depending on priorities, resources, size, and the student body of which it aims to serve (COL, 1997). For instance, ODL institutions in developed countries typically use ICT-based courses, while institutions in developing countries use printed materials as its primary medium of instructional delivery. The use of ICT in ODL in the developing country such as Indonesia is still at experimental stages, and even though many institutions are ready to experiment with modern ICT-based courses, access and participation by students is still relatively low (Belawati, 2005). It is the challenge for institutions in the developing country such as Indonesia to socialize and educate students, educators and the society in using ICT facilities for ODL enterprise (Belawati, 2005).

Quality of processes is more difficult to address than products. Various kinds of learning supports may be provided by institutions like tutorial services, organized study groups, library access, and access to learning resources (COL, 1997). Indeed, most ODL students are at liberty to decide for themselves whether or not to use learning resource facilities (COL, 1997) and in some cases, students cannot access learner support facilities – i.e., living far from learner support facilities (Fozdar, Kumar & Kanan, 2006). The challenge for ODL institution, therefore, is not only to ensure learner support that is both accessible and relevant, but also to encourage students to participate in and use of support systems that ensure quality-learning. Management and decision-making processes are similarly difficult to assess. Indeed, it takes some time to observe how the quality of 'decision-making' influences a given institution (COL, 1997).

In terms of production and delivery system, ODL may be likened to industrial management (Peters, 1983). Management is crucial in ODL, as management activities follow assembly-line procedures and some jobs require craftsmanship. Deadlines and schedules must be met. What goes wrong in one activity can have a domino effect on subsequent activities, oftentimes with devastating consequences. For instance, delays in meeting course development deadlines can result in delays in production, printing, dispatching, and even in whether or not students receive their learning materials on time. In extreme cases, students examination schedules can be postponed, simply because they did not receive their learning materials in time. Producing learning materials – including tutorial services – requires quality professionalism (UT, 2002).

In terms of philosophy, the institution's vision, mission, and policy documents are often well-stated and tend to be widely circulated among staff. The problem, however, is 'how' staff actually understands the meaning of these documents (Daft, 2006). The challenge for ODL leaders therefore, is to engineer organizational change in such a manner that staff members focus their time, energies, and priorities on achieving institutional goals and missions. Consultation and communication between institutional leaders and staff is necessary to socialize and internalize these ideals, making them part of the organizational culture based on QA principles. Implementation of the institutional missions, policies, and strategies requires constant follow-up and guidance from the top level leaders (Daft, 2006).

ODL in higher education institutions is under increasing pressure to meet students' demand for flexibility, as students have increasingly diverse background and needs. To meet this challenge, innovation is essential. Innovation in ODL assumes that new techniques will help individual institutions achieve their aims in terms of concrete access, cost, quality, and flexibility (Daniel, 1999). In this context, technology becomes a vital tool in ODL. For technology-based

universities, particularly open universities, the quality of teaching and learning is of critical importance, as ODL materials are open to public access and scrutiny, and when the use of information and communication technology is involved, such access can often become global (Bates, 2000). Components of quality in technology-based educational materials include content, media production, instructional design, and delivery and student support (Bates, 2000).

QA can be adopted as an effective method and tool to respond to the challenge of quality in ODL. QA is not an effort to create quality, but rather a systematic and comprehensive effort to improve quality. QA, therefore, is not a means to achieve particular target and develop procedures, but rather a continuous process of improvement. QA is based on the assumption that quality can be improved continuously. Systems and procedures that are developed for this purpose ensure that staff continuously and critically question the quality of ODL products and processes, and continuously attempt to improve it. Because QA is inspired by the business practice, it uses the language commonly applied in business, such as customer, service, product, and efficiency. Traditionally, educational institutions consider such an approach as inappropriate; however, escalating pressures from all stakeholder groups for greater accountability requires ODL institutions to have quality self-assessment. ODL systems operate like a service organization premised on industry-like operations, such as design, development, production, and distribution of multimedia learning materials.

Implementing QA principles in a DE institution is a monumental task. It takes a great deal of effort, patience, socialization and training to ensure that innovation is a productive effort. People in organizations undergoing change will talk about quality, but may not know exactly what 'quality' means, specifically how to initiate, provide, and improve upon quality processes, products, and services continuously. Changing an organization's mindset is one of the biggest tasks when undergoing 'innovation'. Such change requires a great deal of courage and commitment of the top leaders of an institution (Daft, 2006). Implementation of QA implies change of work culture of staff at all levels. Everyone in the organization must think about – and more importantly, do something – to effect quality improvements in every step of their work activities. In theory, drafting organizational change and improvement could be easy (Daft, 2006). In practice, however, leading people towards change is a formidable task. People tend to maintain status quo, and resist new ideas, even if these ideas are to improve their professional practice (Daft, 2006; D'Aprix, 1995).

Realizing that change is difficult to achieve, coupled with the need to increase the accountability of their educational institutions, the Indonesian Ministry of National Education states that every higher education institution in Indonesia must have a QA system in place, one which will ensure the realization of Indonesia's vision in satisfying the stakeholders' social, industrial, and professional needs. To ensure the application of any QA system within universities, the Ministry of National Education through its Directorate General of Higher Education has generated institutional reports examining the implementation of QA, which is one of the core requirements for obtaining the government-funding through both competitive and devoted funding schemes. Even without this external pressure, Universitas Terbuka (UT) has been committed to and implementing an internal QA system to assure its accountability to its stakeholders.

About the Universitas Terbuka

Indonesia embraced DE in 1955 with the establishment of a correspondence diploma program aimed to upgrade teachers. It was not until 1981, however, when two 'crash' DE projects were developed to provide in-service training to secondary and tertiary level teachers to enhance their

teaching skills, and help Indonesia meet the demand for additional teachers. Indeed, teachers who required upgrading could only upgrade their skills via DE, since regular face-to-face training was too expensive and replacing teachers for further training was difficult. It was these programs which later formed a sizable part of Universitas Terbuka (Indonesia Open University) in 1984.

UT currently serves over 320,000 students nationwide. UT is supported by a strong centralized management system with its Head Office (HO) located in the capital city of Jakarta and 37 Regional Offices (ROs) throughout the country. Although these offices are located in or very near relatively big cities, they oftentimes do not have the appropriate infrastructure for accessing electronic communication. Despite recent efforts to enhance the use of ICT, communication between UT's HO and its ROs still rely heavily on mail and courier services, telephone, and/ or facsimile. The use of ICT-based communication channels, such as e-mail, has only been available since 2004.

UT offers over 1000 courses delivered through 34 Study Programs, under four faculties: Faculty of Economics and Developmental Studies (FEKON), the Faculty of Social and Political Sciences (FISIP), the Faculty of Mathematics and Natural Sciences (FMIPA), and the Faculty of Teacher Training and Educational Studies (FKIP). The Faculty of Education offers only in-service training programs for practicing primary and secondary school teachers, while the other three faculties are open for high-school graduates and working adults.

Establishment of a QA Centre and Adoption of a QA Framework

The changing paradigm in higher education management, including higher education at a distance, has triggered UT to implement a quality assurance system. Historically, 'quality' was one of the key agendas of the Indonesian Government and its cadre of higher education institutions. Nonetheless, many institutions – UT included – faced constraints and hurdles that made it very hard to put the idea of 'quality' into a concrete practice. Efforts to improve the quality of DE services already existed in UT albeit very broadly. It was only in 2001 when UT developed its 2001-2005 Operational Plan, that 'quality' was explicitly focused on three core areas: 1) academic quality; 2) student participation; and 3) internal management (UT, 2001).

Based on that 2001-2005 Operational Plan, concrete action was taken in the formal establishment of a Quality Assurance System Committee in October 2001. This committee charged with developing UT's quality policy manual, comprised 10 people under direct supervision by UT's Rector and Vice Rectors. Their first assignment was developing a framework for UT's quality assurance system. Being one of the founding fathers of the Asian Association of Open University (AAOU), the Committee believed that the AAOU Quality Assurance Framework (still in draft at that time) should be referred to, and adopted at, UT. Guided by the AAOU framework, the Committee formulated the university's QA policies in consultation with the university's high officials, followed by in-depth discussions with UT staff in various units. Eventually all involved agreed on the policies stated in Sistem Jaminan Kualitas (Quality Assurance System) Universitas Terbuka (UT, 2002) abbreviated here as SIMINTAS.

UT's quality policy manual was further disseminated at the annual National Coordination Meeting, held at UT's HO in April 2002. One major outcome of this meeting was the development of definitions for 'quality self-assessment' and recommendations for improvement. UT followed-up by writing quality assurance manuals that systematically documented UT's operational activities and procedures, and put in place protocols to continuously improve and consistently apply the documented procedures in UT's daily work activities. Numerous small

teams, comprising over 200 academic and administrative staff, worked intensively and cooperatively to produce UT's quality assurance manuals and pilot and implement the procedures. The significant outcome of this activity was the development of UT as a 'learning organization' wherein people readily learn the best practices of others (Daft, 2006).

During the follow-up National Coordination Meeting in March 2003, the implementation of SIMINTAS was formalized under the auspices of the Rector's Letter of Decision on the Use of QA Manuals. In 2003, 113 QA manuals were produced documenting UT operational activities and were ready for use to guide UT's activities and operations. On July 21, 2003, the Quality Assurance System Committee was formalized and converted into the QA Centre (known as the Pusat Jaminan Kualitas abbreviated here as PUSMINTAS). Beginning in 2004, UT entered the New Year with "the Spirit of Quality Assurance System" called the "Gelora SIMINTAS" in which UT transformed itself into becoming a full-fledged learning organization.

The year 2004 was a significant milestone for UT, as that is when UT finally put its words into action. 2004 saw UT using its QA manuals consistently; it saw UT implementing its QA system using tangible annual action plans to support continuous improvement; it saw UT participating, supervising, and motivating its staff to accomplish sets of specified targets; and saw UT establishing an organizational culture focused on quality and efficiency as documented in its QA manuals.

As in any organizational change initiative, however, some staff members reacted unfavourably and agitated to retain their timeworn, conventional work styles. Quality improvement, on the other hand, not only necessitates significant effort, commitment, and investment in terms of time, resources and cost, it requires all staff members to question and challenge all they take for granted. Indeed, QA requires significant and active participation from all people within the institution. This not only takes clear direction from leadership, it takes solid, ongoing commitment from all levels to improve UT's quality continuously.

The Steps of QA System Implementation

As stated previously, UT adopted the Asian Association of Open Universities (AAOU) Quality Assurance (QA) Framework, drafted to assist AAOU Member institutions, in which UT was but one of many founding members. To contextualize AAOU framework, UT modified the AAOU best practices and developed quality indicators to address its unique institutional needs and relevance within the Indonesian higher educational context. UT's implementation of AAOU framework used the following five steps:

1. Development of QA policy manual
2. Self-evaluation and priority-setting for quality improvement
3. Development of the QA job manuals
4. Implementation and revision of the QA job manuals
5. Continuous evaluation of QA implementation

1. Development of QA policy manual

Modifying AAOU QA framework as a guide, the PUSMINTAS Team formulated the university's QA policies in the form of 'best practices.' These policies, later known as the QA Policy Manual,

comprise 107 'best practices' under nine main components, and reflect the UT's comprehensive needs to operate quality DE programs:

1. Policy and planning (7 best practices)
2. Human resource recruitment and development (9 best practices)
3. Management and administration (21 best practices)
4. Learners (10 best practices)
5. Program design and development (6 best practices)
6. Course design and development (14 best practices)
7. Learning supports (18 best practices)
8. Assessment of student learning (15 best practices)
9. Media for learning (7 best practices)

2. Self-evaluation and priority setting for quality improvement

In order for UT to understand the existing 'quality,' it is important to self-evaluate perceived notions of 'quality' in each sub-process within the university's larger operations versus best practices as formulated and articulated in the QA Policy Manual. To effect QA implementation, therefore, the 'best practices' contained in the QA Policy Manual were converted into a self-evaluation instrument using quality indicators and 1-4 Likert-type scales to assess individual best practice statements.

The quality self-evaluation was carried out using a consensus approach and conducted step-by-step, with 'self-evaluation' starting at the lowest unit level (e.g., academic department) moving higher up the university hierarchy. At each level, the unit was asked to honestly and consistently self-evaluate their processes on each quality indicator. This level of 'self assessment' was blameless, meaning it was not intended to 'point fingers' but instead to realistically identify the strengths, weaknesses, achievements, or mistakes of any particular unit. Results of quality self-assessment reported both low and high-perceived quality levels, as measured on 'best practices' in the QA Policy Manual.

UT's self-evaluation activity was administered twice, first in 2002 and then again 2005, using the same instrument. Results of UT's self-evaluation have been cautiously encouraging. While there was an increase in the average score over time for all 107 best practices in the survey instrument, ranging from 2.46 in 2002 to 3.83 in 2005 (an increase of 1.37), many felt that the increase should have been higher. The results of UT's self-evaluation survey was discussed at length and, upon closer examination, it was generally felt the lower-rate of change was due to the fact that staff expected to achieved more than was possible, and not because of lower levels of actual achievement. When viewed in this light, the findings show that 'quality' is on everyone's mind.

3. Development of the QA Job Manuals

The self-evaluation instrument also gathered data on 'shared opinions' about the priority for improvement. Based on both the 'perceived importance' and 'perceived quality' of each aspect, priorities were determined. In order for UT to assess its practices continuously, it became clear that all systems, mechanisms, and procedures needed to be documented. Thus, UT's first priority was to develop in-depth Job Manuals.

UT's QA Job Manuals were articulated as reference standards; they contain well-defined and clearly stated systems and procedures, records of activities, and work instructions to guide staff in their daily activities. Put simply, UT's QA Job Manuals were developed to support continuous improvement throughout the UT organization. The QA Job Manuals describe UT's work-flow and activities in detail along with performance standards, expected output, and needed resources and competencies to perform each job.

The QA Job Manuals define tasks and show the interrelationship between individual units and other units charged with performing specific activities. The outcome was a systematic process map of individual activities and their interrelationships with various other activities. The result was a visual flowchart with clear descriptions of each activity and a visual relationship to other activities. The procedures described in QA Job Manuals show in detail the stages of each activity and organised systematically to build a vision of what the whole system should look like and how it should optimally operate. In sum, UT's QA Job Manuals contain project objectives, scope, definition, reference, requirement, related unit(s), and detailed description about various activities.

More significantly, the QA Job Manuals were developed by the users themselves in that they were formulated and written by hundreds of UT staff drawn from various units within UT, and broken out into small groups. Put simply, the QA Job Manuals detail real jobs and provide guidelines for activities. Those charged with writing the manual determined the scope of the manual; developed the manual's outline; wrote the first draft; reviewed and revised subsequent drafts; and finally, implemented the manual. Each unit in UT has specific working procedures and as such, the number of OA Job Manuals developed has increased to address UT's organizational needs. As of December 2005, UT has developed 198 job manuals to guide various tasks (See Appendix 1).

4. Implementation and revision of the QA Job Manuals

The next critical phase is implementing the OA Job Manuals. First, everyone needs to know where they are going, and a rough 'roadmap' detailing how they should get there. To help employees navigate the roadmap to UT's collective future, institutional leaders clearly articulated their vision of UT's future. They shared their vision of UT's future, repeated from time-to-time to ensure everyone is on the same page, and that everyone understands what is expected of them in performing their daily tasks. These expectations are articulated in the OA Job Manuals.

It is important to note that while the OA Job Manuals document existing procedures and practices, all staff members were asked to reflect critically upon their work activities and strive to incorporate new quality standards. Staff were also asked to evaluate to whether or not the formally stated performance standards and indicators as written in the OA Job Manuals were, in fact, achievable given their actual work experiences. This reflective activity helped UT's staff members to identify roadblocks challenging their progress towards 'quality.'

Throughout, UT's senior leadership was very active setting examples for staff, providing learning and training opportunities, and providing guidance and supervision where and when needed. The goal of such deep 'self-examination' ultimately results in staff challenging and changing outdated work practices that would otherwise likely remain the status quo.

5. Continuous evaluation of QA implementation

Effective implementation of QA requires significant change in the collective mindset and work culture of the institution. QA requires everyone within the institution to walk the talk by appreciating, respecting, and applying 'quality' everyday. The challenge for leadership is to carefully manage the innovations and changes taking place, and transform existing culture to one that is 100 percent supportive of QA as a daily work goal. Implementing QA in a large institution, such as UT, necessitates constant commitment, strong perseverance, solid esprit de corps, to ensure it can have the greatest and most positive impact both internally and externally. This takes highly visible and vocal leaders committed to providing and instilling QA in all staff members.

The role of human resources is significant in implementing QA. Simply put, people make things happen. Units and individuals meeting or exceeding high-performance standards need to be fairly assessed and rewarded for their efforts. To meet this objective, UT developed a fair performance appraisal system comprised of 1) clearly defined job descriptions; 2) clearly defined performance standards; 3) fair performance assessment procedures; 4) an equitable appeal process; 5) an incentive system tied to performance; and 6) confidential feedback mechanisms. In other words, UT is seeking to reward its quality performers while at the same time seeking to identify under-performers and offer assistance to help them reach minimum levels of quality performance. In sum, UT's goal is provide the means to allow its people to improve the university's overall performance and support its efforts in continuous quality improvement.

Since first introducing QA in 2003, UT has been steadily evolving into a true 'learning organization' (Daft, 2006). Critical evaluation and self-reflection – primarily achieved during the drafting the OA Job Manuals – has motivated UT staff to work more effectively and efficiency. In fact, many UT staff members are now obsessed with performance, improvement, and quality. This is evident in UT's QA Job Manuals, which have been revised three times in less than three years. With each revision, one can read more and more credos such as "quality begins with us." Indeed, strong commitment from UT's leadership at all levels has made everyone working for UT think constructively and act to produce highest-quality ODL products needed to satisfy ever increasing consumer demand.

External Assessment and Accreditation

Quality is a perception, which must be verified. Indeed, it is easy to talk about QA, but it is much harder to put words into action. This means 'perceptions' of QA need to be validated by external auditors. External audits are not only needed to assure external stakeholders that UT is performing well, but also provide an valuable feedback to UT staff on whether or not they are, in reality, achieving UT's 'quality' benchmarks.

External quality assessments force institutions into proving the 'soundness' their QA systems. Such audits typically review documented procedures and physical products versus actual performance. To gain this valuable outside perspective, UT invites quality assessors from different outside agencies to assess its overall performance. Such agencies include the *International Council for Open and Distance Education (ICDE)*; the *International Standards Agency (ISA)*; the *International Organization for Standardisation (ISO)*; and the *National Accreditation Board for Indonesian Higher Education (BAN-PT)*.

ICDE is the largest DE membership organization. ICDE has been actively engaged in defining QA and certification of trans-national educational providers for many decades, especially of ODL provisions worldwide. The ICDE-ISA, an open and distance education standards agency, was established as a global actor in the field of quality assessment. ICDE-ISA's mandate is to promote public confidence in ODL, in its standards, in its awards, in its quality. As written in its official publication (ICDE, n.d.), ISA's audits does not involve academic standards or qualifications simply because no universally agreed upon international standards for qualifications currently exists. Moreover, curriculum and academic content are regulated by the country or region of origin and outside legislative purview of international agencies. In short, ICDE-ISA assumes that institutions will be operating within their overall national context and subject to their own national legislation and guidelines. As such, ISA audit is more concerned with auditing on broader concepts, such as an institution's responsibility to its ODL students. Put simply, ICDE-ISA's audit places emphasis on students – specifically, the quality of the information they receive, the means by which ODL is facilitated and supported to their best benefit, and basic expectations of the what they might reasonably expect to achieve. In 2005, ISA's award of Certificate of Quality and International Accreditation, reassured UT's stakeholders about UT's strong commitment in providing quality DE in Indonesia. The accreditation process also provided UT's leadership and staff with much needed feedback on past and current achievements and areas for improvement.

The International Organization for Standardization (ISO) is a global network that identifies international standards required by business, government, and society, and develops them in partnership with those economic and service sectors that will put them to use. ISO standards distil international consensus from broad-based stakeholder groups. Input comes from experts closest to the need for the standards. These experts also suggest ways for implementing such standards. ISO standards, although voluntary, are widely respected and accepted by public and private stakeholders on an international scale. Earning ISO certification fosters UT's internal transparency on the use of previously 'self-developed' standardized procedures. The preparation of its obtainment started in 2005, and in March 2006 UT was awarded certification for ISO 9001:2000 for the quality management process of course materials distribution from the Headquarters to Regional Offices. At the time of the writing of this paper, UT is making the necessary preparation for ISO 9001:2000 certifications in the areas of academic development that includes the development of course materials and examination materials, and the management of 11 Regional Offices.

The third external auditor is the National Accreditation Board for Indonesia Higher Education (BAN-PT). This is an accreditation certification that emphasizes in the quality of input, process, and output of education at academic department/study program level. The assessment is done through desk evaluation of the university's portfolio, the Study Program's Self-Evaluation Report and completed accreditation instruments, as well as site visit that includes observations and interviews with representatives of the university's and the faculty's top management, support staff, tutors, and students. The accreditation is granted to individual Study Program within a university, once the respective Study Program has fulfilled the performance indicators set by the Board. The accreditation status is valid for five years and it has to be maintained regularly. At the writing time of this paper, UT is in the process of renewing the accreditation of all its Study Programs.

It is with the three external quality assessors emphasizing in slightly different aspects of UT's management, services, and products, UT is confident to move progressively in its QA system. UT considers the external quality audit is as important as the internal QA process. The most important part of the accreditation process is not in the obtainment of the certificate but more in

the course of action of getting it. The process of getting each certification and or accreditation has enforced all parties involved to diligently follow the standardized SOP and strictly assure that all the services and products satisfy the main stakeholders.

Lessons Learned and Concluding Remarks

Several lessons can be learned from UT's endeavors and experiences in QA implementation. First from the beginning, UT was very serious about implementing QA. QA did not just happen overnight or piecemeal at UT. In fact, we would be very wrong to give the impression that QA simply 'happened' because we decided to document our work processes and procedures and put policies down in writing – although doing so was clearly an important exercise in self-evaluation and critical reflection! Instead, QA was a well thought out, well-planned, fully integrated operational strategy at the UT, one that encompassed the entire university as an organizational whole and touched upon every process and every unit and every person and every job performed. UT's leadership was rock solid; they invested time and energy necessary to lead and guide the QA process and provide adequate resources to support and sustain QA-related activities. All UT's initiatives were carefully planned and diligently applied with underlying philosophy that all UT's product and services must improve continuously and strive for 'quality.'

QA implementation requires shared responsibility of all UT staff and management. UT's leadership provided clear direction, supervision and resources, and communicated clearly to all stakeholders involved. Challenging and changing prevailing mindsets was essential. QA can only work when everyone is fully of aware and understands what is involved, and that it takes effort and commitment to make 'quality' happen. And it can only happen when all stakeholders from students and frontline staff, to university leadership and government, has input.

A recent trend in QA is that of evolving to become a 'learning organization' (Daft, 2006). As reported by the Commonwealth of Learning (Koul & Kanwar, 2006) this involves building cultures of 'quality' throughout DE organizations worldwide. Case studies from DE institutions from around the world show ODL's move towards 'quality' provisions and cultures (Koul & Kanwar, 2006). ODL institutions must learn from each other by communicating and sharing QA benchmarks and best practices.

QA is essential for improving organizational efficiency and effectiveness, increasing public accountability. To meet the challenges of implementing QA, organizations must be ready and willing to adapt, change, and innovate. QA activities must be clear and transparent and, more importantly, they must be achievable and able to meet customer expectations. When QA systems and procedures are clear and activities well defined, only then can ODL institutions meet high quality standards. Internal and external audits must take place so that institutions can track their performance, address any weaknesses, and build upon their successes. ODL institutions must be fully accountable to all stakeholders whether they are government officials, taxpayers, employees, or students. DE institutions that embrace QA principles must constantly strive to improve the quality of their work. To do this, ODL institutions must be open change and innovation, and ready to adapt and engage in global partnerships and competition. Benchmarks and audits must happen regularly and involve staff and management from all levels. QA also requires strong commitment from every stakeholder, from institutional leadership to front line staff, from taxpayers to students. In sum, QA as a management strategy is an effective approach to achieve excellence.

Problems must be anticipated. QA not only requires adequate funding and ongoing commitment, it requires an 'open mind' to recognize problems. Sustaining and building upon a quality work culture within an organization is a significant challenge. QA should bring about positive changes in organizational structure and culture and lead to measurable results. QA provides ODL leaders with an effective instrument that has helped DE institutions achieve highly recognizable and credible brands. They must also be open to collaboration and competition with other providers, particularly when they have high quality programs.

Effort has only just started at UT. It time to see QA's influences on UT's overall performance. Recent efforts undertaken at UT including linking QA to it human performance indicators. Quality performance is rewarded at UT. Job Manuals help to guide UT's staff members in performing their daily tasks. Writing these QA Job Manuals, however, is more than just documenting daily activities of staff; it involved team building and establishing esprit de corps, improving work systems and procedures, and challenging and changing UT's organizational culture.

Continuous assessment is central to QA and done by individual units to determine what works and what does not work well, and if they are meeting their goals. When units do not perform to a certain benchmark, the university can then undertake remedial actions to help that unit improve their performance.

Finally, only people can make QA happen. UT staff sign agreed-upon work contracts and evaluated throughout the year to monitor their performance. At the end of the year, individual and unit performance is assessed in terms of actual achievement *vis-à-vis* established benchmarks. If any person or unit is found to fall short of their performance goals, then systems and procedures are examined carefully to ensure they have the skills, tools, and knowledge they need to improve. Performance is directly linked to incentives and compensation, with high performers being rewarded for the effort, innovation and abilities.

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Replacing Face-to-Face Tutorials by Synchronous Online Technologies: Challenges and pedagogical implications

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Abstract

This paper reports on a study which investigates the implementation of a synchronous e-learning system (*Interwise*) for online tutorials on an information technology related course offered by the Open University of Hong Kong (OUHK). It examines a set of interview data related to students' and tutors' views on the use of the system. Issues concerning students' participation in online tutorials, opportunities for interaction in using the system, and tutors' roles in real-time conferences are discussed. The findings suggest that both the students and tutors are positive about the use of *Interwise* for online tutorials in general. Some students, however, indicate dissatisfaction with the one-way communication and teacher-control functionalities of the system. The results also indicate that the tutors are concerned about the workload involved in using *Interwise* in terms of managing the functionalities of the system and the different learning tasks. Implications are then drawn for supporting synchronous online learning both in the OUHK and a wider academic context.

Keywords: synchronous e-learning system; interaction; online tutors' roles

Introduction

The delivery of distance education is usually supplemented by various forms of technology. Recent and rapid improvements in information and communication technologies and the increasing bandwidth of Internet access have made the use of synchronous solutions for instruction more popular. The nature of interaction and the type of instructor support required by asynchronous and synchronous learning environments differ; and the use of synchronous conferencing techniques has unique benefits in education. First, real-time interaction allows simulation of a real classroom learning situation and immediate interactive clarification of meaning (Steeple, Jones, & Goodyear, 2002). Salmon (2000) also notes that synchronous conferencing through the Internet offers participants a feeling of immediate contact, motivation, and even some fun, which is especially valuable for distance learners.

As a distance learning institution, the Open University of Hong Kong (OUHK) is very interested in exploring strategies to improve the learner support system. Typically, support services include an element of face-of-face tuition to supplement learner progress with self-instructional material. Students are divided into tutorial groups, and each group is taken care of by a tutor who is a part-

time staff member of the institution. These sessions are conducted every two to three weeks throughout a semester and are held in weekday evenings or weekends to meet the schedules of working adults. Students' participation in these sessions is optional, but they are strongly encouraged to take part in them to benefit from tutor support and share their perspectives and experiences.

Live e-learning with Interwise

In the April 2003 presentation, the *Interwise* system was implemented on a pilot basis as an innovation for providing online tutorials for some information technology (IT) related courses. There are several delivery platforms in *Interwise*, each serving different communication purposes (for details, visit the *Interwise* website at: <http://www.interwise.com/product/>) and the *iClass* platform was adopted. Students' and tutors' roles in *iClass* are outlined in Appendix 1.

Compared with text-only synchronous communication technologies, the *Interwise* system has some strong, value added features. For example, it allows the transmission of video, images, *PowerPoint* slides, and information exchange on a whiteboard. Also, the audio elements in the system are considered to be very useful features by tutors and students. Instead of typing, students can talk with each other and their tutor, just as in a conventional classroom. This relieves students from intensive writing, "which could be a burden in online communication as good keyboarding skills, language proficiency and plenty of time are pre-conditions" (Robertshaw, 2003, p. 10).

Preliminary studies were carried out with the April 2003 cohort of students and tutors, and they showed user satisfaction with the features of the system in general (Chung, 2004). The present study is a more in-depth investigation to research the associated pedagogical issues and the new challenges this technology presents. The notion of 'pedagogy' is worth clarifying. It covers several interrelated dimensions such as: educational goals and purposes; a view of learning, and the learning and assessment activities required; and the roles and relationships among learners and between the teacher and the learner (Leach & Moon, 1999). The present research reported here, however, focuses mainly on issues related to interaction opportunities and tutors' roles in synchronous online learning environments.

Theoretical Ideas Underlying the Study

Interaction in synchronous communication technologies

Interaction has long been a defining and critical component of the educational process and context and has always been valued in distance education – even in its most traditional, independent study format (Holmberg, 1989). The effectiveness of the interactive learning experience, however, is influenced by a range of diverse and complex factors.

For example, Sims (2003) used a survey instrument to examine perceptions of the relationship between interactivity and learning in the context of online and flexible learning environments. The participants were students ($n = 68$) studying an undergraduate course in multimedia and interactive learning in an Australian regional university. Six themes related to participants' expectations of effective interactive online learning experience – engagement, control, communication, design, the individual and learning – were identified. Sims (2003) argues that "learners taking on a more participatory role" and "creating opportunities that are more adaptable

to the characteristics and preferences of the individual users" (p. 101) are essential determinants of the success of interactive, computer-enhanced learning environments.

Anderson's (2003) notion of 'equivalency of interaction' adds a useful perspective on the issue of interaction in online learning. It claims that no single medium supports the educational experience in a manner that is superior in all ways to other media. Therefore, "deep and meaningful formal learning is supported as long as one of the three forms of interaction (student-teacher; student-student; student-content) is at a high level. The other two may be offered at minimal levels, or even eliminated, without degrading the educational experience" (¶ 10). Anderson (2003) also notes that synchronous technologies, such as audio and video conferencing, provide slightly less interaction between students and among teachers and students due to the inherent technological distance between students and teachers imposed by the mediating technology. Although high levels of student-student interaction are possible in these conferencing systems, there is much anecdotal evidence that teachers often use the media almost exclusively for lecture-type delivery.

Some studies have indicated greater improvements in the level of active participation, the quality of discussion and group dynamics when synchronous collaborative systems are brought into teaching (Marjanovic, 1999). McAlister, Ravenscroft, and Scanlon (2004) also found that their design for synchronous online peer discussion, which included contextual issues, led to improved argumentation and collaborative knowledge development among their UK Open University students. They considered that social relationships, shared understanding, and clear identities were of particular importance in synchronous online interaction.

Tutors' roles in synchronous online teaching

While there has been extensive research into the role of tutors in facilitating asynchronous online discussion, less attention has been paid to the part they play in synchronous online learning environments. Salmon (2000) considers that "the role of the e-moderator in online synchronous discussion reflects some of the qualities of the asynchronous e-moderator, especially to focus the conference at the beginning, keep it roughly on track and summarize it" (p. 46).

Several studies have been carried out to examine the tutor role/ participation in synchronous online learning environments. For instance, Ligorio Talamo, and Simons (2002) carried out a cross-national project involving a virtual community formed by students, teachers, and researchers from two countries – Italy and the Netherlands – who designed, built, and populated a three-dimensional world. The findings suggested that the tutors had a very significant role in the four functions in chat room activities – namely, managerial, social, technical, and pedagogical.

Also, Burnett (2003) examined tutor participation in synchronous online chat by analysing the chat records. Three areas of tutor responsibility in online chat were identified – social, organizational, and intellectual. The studies by both Ligorio and colleagues (2002) and Burnett (2003) highlight the significance of the social dimension in establishing a supportive atmosphere in synchronous interaction and indicate that the tutor needs to play the role of a facilitator rather than a leader.

e-Moderation of academic discussions presents various challenges. For example, reflecting on his experience in managing online chat activities, Ng (2004) considered that the handling of participants' communication anxiety was a very significant issue. Real-time interaction requires immediate responses, which may make students anxious; and anxiety can also be caused by delays in replying to messages. In-depth clarification of academic issues also seems difficult in

real-time interaction. Moreover, spontaneous responses can be problematic for some students as the opportunity to participate may be lost if the pace of the discussion moves too quickly.

In summary, the tutor plays a significant role in promoting a meaningful interactive learning experience for students in synchronous online learning environments. Anderson, Fyvie, Koritko, McCarthy, Paz, et al., (2006) suggest that the tutor needs to plan thoroughly for an effective and inclusive synchronous learning experience and pay particular attention to the following problems:

- The online conferencing tool may be new to the tutor and the participants;
- The learning environment may provide multiple tools for communication and presentation, such as text-chat, synchronous presentation, shared whiteboard and co-browsing;
- There is a short time-frame in which to cover the required material and to solicit active participation; and
- Technical problems may arise during the session, further reducing the time available.

Purposes of the Study

This study explores the following questions related to the pedagogical issues and challenges *Interwise* presents:

1. How did the tutors use *Interwise* for teaching and in what ways did the students participate in online tutorials?
2. What factors can facilitate or hinder the opportunities for interaction and effective teaching in the *Interwise* system?
3. How did the tutors perceive their roles in online tutorials in comparison with face-to-face tutorial sessions? How did the students perceive the tutors' roles in online tutorials? Did this match their expectations?
4. What were the students' preferences as regards to online tutorials and face-to-face tutorial classes?

Methods

A case study approach was adopted for the study. In the context of implementing online technologies for teaching and learning, case studies are useful methods for providing insights for planning and staff development purposes, as well as in policy making within institutions (Murphy, Walker & Webb, 2001).

Selection of the case – U123

U123 – Introduction to the Internet is a foundation course for students who need to acquire basic practical Internet skills. The course is designed for students with a wide range of experience with the Internet. By selecting this course, the research benefited from the relative stability of the

course material, as well as the team of tutors already trained and experienced in both supporting the course and using the *Interwise* system.

The students and tutors in the April 2005 presentation were invited to participate in interviews. There were approximately 200 students in this cohort who were divided into six tutorial groups. The tutorial support included 13 sessions and was offered alternatively in a face-to-face mode (seven sessions) and an online mode (six sessions), with students' participation being voluntary for both modes. At the time of the study, the attendance level in online tutorials was about 50 percent (about 16 students in each tutorial group).

Data collection method

Six tutors (labelled T1 to T6 in the quotations in the results section) and eight students (S1 to S8) participated in the interviews during September and October 2005. A semi-structured approach was adopted in the interviews and a Research Assistant (RA) conducted them by phone. The interviews were carried out in Cantonese, and were transcribed and translated into English for analysis. The interview questions are provided in Appendix 2.

Interview data analysis

The tutor and student interview data sets were first handled separately. Interviewees' responses to similar questions were grouped; when the data had been ordered, various themes emerged. The themes which arose from both the students' and tutors' data sets were then compared for triangulation purposes, and were discussed by the author and the RA for conceptual verification. Finally, the data were coded by the author and cross-checked by the RA to ensure the validity and reliability of data interpretation.

Results

All the students were new to the *Interwise* system, but the tutors had at least two years' experience using it for online tutorials in either U123 or another course *U234 – Website design*. In general, students considered that the system was not difficult to use and that the instruction guide was easy to follow. Some reported that they encountered initial hiccups in setting up the system, but the problems were solved by consulting the IT support unit or the tutors. Some also reported confusion in using certain features in the system (e.g., the recording function) at the beginning, but the issues were clarified with the tutors very quickly.

The use of Interwise for teaching

When asked how they used *Interwise* for teaching and which of its components they employed most often in conducting online tutorials, the tutors noted that 'lecturing' was the main activity. They considered the 'browser' feature in *Interwise* (loading webpages on the whiteboard) to be convenient for lecture delivery. All had used the browser for uploading teaching materials or webpages, which they could then explain to students through the audio channel.

Students can ask the tutor questions by sending them text messages (private notes) or through the audio device – with the latter requiring students to have a microphone and permission to speak through the system. The tutors noted the students' preference for sending text messages, which in some cases posed difficulties. For example, one tutor commented that,

"I may receive several text messages at the same time. While I am typing my answers, there are other messages popping up . . . the biggest problem is there will also be 'dead air' while typing and I cannot talk to students" (T1).

In general, however, most students were not particularly keen on raising discussion questions in online tutorials, so the time allocated for discussion was usually short (roughly about 1/4 of the tutorial time).

Some tutors used the Q&A features (Yes/ No type questions and multiple-choice questions) in *Interwise* to monitor students' responses and progress. One tutor considered that such features were useful for gaining students' feedback because,

"All students get an opportunity to answer the questions" (T2).

Another tutor, however, noted that,

"Answering MC type questions can't tell you whether students really understand the course content or not" (T1).

Finally, the tutors rarely used features such as 'application sharing' or 'video show.'

"For U123 . . . little application sharing is needed and I can check students' understanding of the applications through posting MC questions" (T3).

Also,

"[Uploading video in the system] would affect the Internet connection and slow down the data transmission rate" (T4).

Students' participation in online tutorials

The *iClass* provides a delivery platform for teachers to upload teaching materials or webpages, which they can then explain to students through the audio channel. Students need to load the learning materials at the start of the session. As noted above, students can ask the tutor questions by sending them text messages (private notes) or through the audio device. In addition, they can record the online session in their computers for revision purposes. In the interviews, the students did not describe their forms of participation in online tutorials in a systematic way. The following are some snapshots:

Preparation and testing systems before class

"I usually read the learning materials before class, and then I make notes for myself. About 30 minutes before the iClass commences, I test all the peripheral devices (such as mic and speakers, computer . . .), just to make sure everything works and is ready for the lesson" (S1).

Jotting notes, searching for information and recording lessons,

"I jot down notes during class but sometimes I might miss out something if the tutor goes too fast. So I record the lessons to ensure that I have access to the course content at a later time . . . I noticed that the tutor doesn't really follow the course materials strictly and I don't always have the notes. So I need to search for the exact references while he gives his lectures" (S2).

Asking the tutor questions by text messages or through the microphone,

"I do ask many questions . . . mostly by text, as I don't want the background sounds from my side to disturb the class" (S2).

"[Prefers asking questions via the mic] . . . it reaches the ears of the tutors directly. With text, I might not be able to convey my messages accurately. It is also faster and other classmates can hear it too . . . " (S5).

Teaching effectiveness and the opportunities for interaction in using Interwise

The tutors considered that the system has several advantages for the organization of online tutorials. Overall, it was not felt to be difficult to use the *Interwise* system for teaching as U123 is IT-related and designed for beginners, and online tutorials can supplement the face-to-face sessions. As one tutor pointed out,

"When there isn't enough time for discussion at the end of face-to-face tutorials, students raise the issues in online tutorials . . . in a way, they tend to participate more during online tutorials' (T2).

The lack of a physical presence in online tutorials can also meet the learning needs of some students. As another tutor observed,

"Some students don't seem to respond to questions raised by their classmates during face-to-face tutorials. But sometimes they respond through Interwise. The absence of physical presence seems to relax them" (T5).

There were also challenges, however, in using *Interwise* for teaching. Technical difficulties can affect the smooth organization of online tutorials. For instance, students encounter problems from time to time with downloading learning materials, a slow network transmission and poor audio effects.

"The stability of the Internet connection and transmission should be improved as well . . . sometimes it takes time for students to load up the same webpages. It is very much related to the bandwidth" (T2).

A more significant issue is that the *iClass* system provides limited interaction opportunities for students in the online learning environment. Some tutors pointed out the limitations of such a design – for example,

"It works on a one-to-one communication format . . . it tends to encourage discussion between the tutor and an individual student rather than group discussion" (T2).

Also,

"The chat information (private messages sent by students to the tutor) cannot be shared with all students in the class. I have come across situations where the same questions are sent to me by different students" (T1).

The above tutors clearly felt that the provision of more opportunities for interaction would enhance the teaching effectiveness of online tutorials, as this would allow students to initiate discussion topics or lead discussion in tutorials.

Opportunities for interaction in Interwise as perceived by the students

Overall, the students considered that the student-tutor interaction opportunities in *Interwise* were adequate. However, they felt that the student-student interaction was extremely limited, for the following reasons.

First, not knowing one's classmates makes communication difficult. Some students indicated that they did not have friends in the class (S4) and classmates were "mostly strangers" (S1). The different learning pace of individual students also makes it difficult to share understanding of course material. One student added,

"Many classmates have not prepared well and have little understanding of course content . . . so I lacked the motivation to communicate more with them . . ." (S1).

Such comments appear to suggest that the social aspect could be a major factor affecting student-student interaction in online learning. Not knowing each other, and without a social support network, student-student communication is difficult.

One student also showed dissatisfaction with the functionalities of the system, which hindered better student-teacher interaction:

"I am not entirely comfortable with having to wait till the tutor finishes all his talk through the Internet before we can raise our questions . . ." (S8).

Finally, some expressed dissatisfaction with the one-way communication feature of *iClass*, as illustrated in the following comment:

"Right now it is only a one-to-one channel. You ask a question and wait for the reply from the tutor, but you cannot chat in real time. Other students cannot join in or show their responses easily . . . I think maybe communication can be improved further . . . not just waiting till you get the right to speak" (S6).

Tutors' roles in online teaching

When asked how they perceived their teaching roles in online tutorials in comparison with face-to-face sessions, all tutors considered online tutorial work to be more demanding. It took them more time to prepare the material for an online tutorial session:

"In addition to the text notes, I have to prepare graphic images and charts as well. Students, therefore, have more questions about the teaching materials which means that I have to prepare more explanatory notes" (T4).

They also need to handle different teaching tasks skillfully in online tutorials. For example, one tutor advised:

"We need to handle different components, tools and programs [in the Interwise system]. We need to focus on lecturing, but when students send in their questions by text, I have to answer them one by one. It takes time" (T6).

Apart from workload issues, the roles tutors need to perform in a virtual learning environment are somewhat different from in face-to-face classes. Several tutors mentioned that they needed to make a greater effort to monitor students' learning progress in online tutorials. They noted that face-to-face tutorials allow observation of students' responses through facial expression and collecting their feedback instantly (T1, T2, T4). With *Interwise*, however,

"It is difficult to tell whether students fully understand what you are teaching" (T4) and "it depends on the actions of the students, for instance their replies to the MC-type questions" (T2).

Students' perceptions/ expectations of the tutors' roles in online teaching

In general, students considered that their tutors used the *Interwise* effectively for teaching and responded to their questions promptly. They commended their tutors for: being well prepared for online tutorials (S6); answering students' questions promptly (S2); and monitoring students' learning processes effectively by sending in MC questions to collect feedback (S7). For instance, the following student praised their tutor's effective control of timing in online tutorials, which is very important in managing synchronous online communication:

"He doesn't linger on for too long. If some demonstration doesn't show, he tells us to wait till the next face-to-face session. There was a time when the connection was off for 15 minutes. The tutor could quickly pick up when the iClass was reconnected . . . the class only overran by 5 minutes or so" (S3).

The students, however, also observed that the tutors have to perform somewhat challenging roles in managing online tutorials and handling different teaching tasks skillfully. They made several suggestions to their tutors for improving the effectiveness of online teaching. One student, for example, considered that the tutor could have utilized the features in the system more fully to facilitate teaching: in addition to using the *PowerPoint*/ whiteboard,

"He could have given more live examples (in the web) so that we can immediately access them" (S1).

The fact that real-time interaction requires immediate responses presents difficulties for some students in discussing course content in *Interwise*. In this regard, they wished more time to think about questions and discuss them, as is illustrated by the following comment:

"He does ask us questions in every session. But during online tutorials, things keep 'flowing,' so it takes time to digest. Before we can understand more about the content, the tutor is already onto the next topic . . . He is giving a very comprehensive account of the content but that leaves us little time for in-depth discussion" (S5).

Finally, the issue of time management in online tutorials stood out again. For example, 'dead air' can easily occur if the tutor does not handle the Q&A function skillfully and delays are then caused by tutor's waiting for class feedback (S4). Interruptions to online classes can also result from the malfunctioning of students' microphones or speakers during the tutorials and late attendants logging into the system (S5). These comments again highlight the fact that moderation work in online tutorials can be very demanding, with important tutor workload implications.

Online tutorials vs. face-to-face classes

Students were asked to compare their learning experience in online tutorials and face-to-face classes and indicate their preferred mode. The issue of interaction was highlighted again. Not surprisingly, the students indicated clearly that face-to-face classes promoted better interaction and more accurate communication. They noted that instant responses are important for communication and the responses are more spontaneous in face-to-face meetings (S3, S4, S5, S6 and S7), as is illustrated in the following comment:

"First, it's about interpretation. Some words cannot be taken at face value through the Internet . . . Maybe it's my own perception . . . but with eye contact; confirmation can be made . . . more accurate" (S5).

Interestingly, except in one case (S5), the respondents also expressed the view that the convenience of online tutorials outweighed the better interaction in face-to-face tutorials. The following comment gives some reasons for such a claim:

*"I find it easier to communicate with other students face-to-face, and see their instant responses . . . I personally prefer online tutorials, as I live quite far away so I don't need to travel to a specific location to attend the class. There are factors such as my full-time job, my children . . . et cetera. It is more convenient to use *Interwise*" (S6).*

Apart from convenience in time and place, some students highlighted other advantages of online tutorials such as: ease in asking questions 'behind the veils' and the fact that questions can be 'better shaped' (S2). They noted that they can record the tutorials for revision, and learn from other tutors who have different focuses (S5, S7). Also the online tutorial mode may suit the study of computer-related courses like U123.

*"For U123, if we attend face-to-face tutorials, we don't have the computers in class. But with *Interwise*, I can use three computers at home at the same time – one computer to view the tutors' materials, and others to search for the related*

materials on the net and do the recording . . . iClass offers more convenience and enhanced usage of the computer" (S1).

Finally, one student noted that a combination of face-to-face and online tutorials is important.

"Both modes have their own advantages. Some students are more passive in learning. Online tutorials allow us to follow the tutor's instructions and try things out . . . Even if issues are not as clear in online tutorials, the problems can be addressed quickly in the following face-to-face tutorials . . . Using Interwise (online tutorials) to cover the whole course without face-to-face teaching is not exactly what I would prefer" (S3).

Discussion and Conclusions

This research has helped to increase our understanding of the pedagogical implications of replacing face-to-face tutorial sessions with online tutorials, and of the challenges in managing real-time conferences for learning. It also highlights some possible areas for further exploration of the opportunities provided by the new technology.

The opportunities for interaction in using Interwise

An important issue in online delivery is whether it can provide an interactive learning environment for the participants. The findings in this study indicated that the students and tutors were concerned about the limited interaction opportunities provided by the technology. Several students indicated dissatisfaction with the one-way communication and teacher-control functionalities of *iClass*; and some tutors also mentioned that the platform might hinder students' participation and their playing a more active role in learning. Both students and tutors, however, were positive about the use of *Interwise* for online tutorials in general. They considered that, as a supplement to face-to-face tutorials, the provision of online tutorials can further meet students' learning needs and had enhanced their study of the course concerned.

The concept of 'equivalency of interaction' (Anderson, 2003) can help to explain their reaction to using *iClass* for teaching and learning. This platform is basically a teacher-led learning environment which is not designed for student-student interaction. The data indicated that 'student-teacher' interaction and 'student-content' interaction were supported by the system, but 'student-student' interaction was achieved at only a very minimal level. Clearly, increasing the learner interaction opportunities has significant pedagogical implications – for example, by including collaborative learning tasks. Other elements in *Interwise* – for instance, the *iMeeting* platform – might provide a more interactive learning environment for learners, and its effectiveness in distance education would be worth further examination.

The tutors' roles in online teaching

Facilitating learning in real time involves complex and demanding tasks (Finkelstein, 2006). The tutors in this study encountered difficulties in managing synchronous online learning, an issue mentioned also by Anderson and colleagues (2006). Their comments highlighted the heavy demands of working in online tutorials in terms of managing the multiple tools for communication and presentation. Also, it took them more time to prepare the material for online tutorial sessions and they needed to make a greater effort to monitor students' learning progress.

The issue of tutors' workload and the related stress in synchronous online interaction needs to be addressed for more effective use of the system – for instance, by reducing class size or promoting/ sharing good practices. Further investigation of tutors' roles and the supporting mechanisms for online teaching is also needed.

The social dimensions of learning

As noted in the literature review, establishing a social network and supportive atmosphere are critical for motivating participants to play an active role in synchronous interaction (Burnett, 2003). Finkelstein (2006) also notes that socialization and informal exchanges are very important for the learning process in synchronous online learning environments, as "they help build community and create a friendly and safe environment in which people can feel like people" (p. 4).

The data in this research suggested that social relationships were not developed among this group of students, which may have hindered their interaction. Students may feel uncomfortable in expressing their views and sharing their perspectives when they do not know each other. Encouraging students to participate in face-to-face sessions can help them to develop social support networks for learning. It is interesting that some students expressed the view that a combination of online and face-to-face sessions is important for learning. The optimum mix of these two modes of learner support and the best strategies for enhancing the social dimensions of learning in an online environment are issues worth further study.

Technical problems in using the new technology

Finally, the technical challenges of using the new learning tools should not be overlooked. Although the participants in this study had an IT background and considered that the system was not difficult to use, some interruptions of online classes did occur because of malfunctioning of the devices. Strengthening the provision of technical guidance/ support and reminding students to prepare and test systems before class can enhance their experience and facilitate the smooth operation of online tutorials.

In conclusion, real-time online instructional tools hold great promise for supporting student learning in distance education. The unique potential of synchronous instruction and communication online, however, must be recognized if the tools are to be used effectively and make a real difference to learner outcomes.

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Appendix 1 Tutors' and students' roles in iClass

Tutors' roles in iClass

1. Define the details of *iClass*, such as scheduling the classes.
2. Establish voice and video control.
3. Work with the pointer and graphic tools.
4. Load materials/ webpages for students.
5. Share an application.
6. Communicate with students using text notes.
7. Send questions to students and monitor their responses.

Students' roles in iClass

1. View whatever the tutor is doing on screen.
2. Converse and exchange text notes with the tutor/other students.
3. Perform whiteboard operations while speaking.
4. Share an application with the tutor.
5. Answer questions posed by the tutor.

Appendix 2 Interview schedules for students and tutors

The interview schedule for students

1. Are you familiar with using synchronous online communication systems?
2. Did you participate in any online tutorial sessions for U123? Why/ why not? (For non-participants, please provide us with more information about why you did not participate and skip the next question.)
3. Please describe the forms of your participation in online tutorials. For example, did you often

ask the tutor questions and respond to his/ her questions? Did you interact with other students when they raised problems and send them private notes?

4. What was your general impression of participating in online tutorial sessions? What was good about using the online tutorial system (*Interwise*)? What was not good about using it?

5. Have you encountered any problems (e.g., technical, social, cultural) when participating in online tutorials? If so, what were they, and how did you try to solve them?

6. How would you compare your learning experience in online and face-to-face tutorials? Do you think the participation in online tutorials has helped your study of the course?

7. Have you any suggestions for improving the organization of online tutorials in the future?

The interview schedule for tutors

1. How did you use the *Interwise* system for teaching? Which components did you use most often? Why?

2. How would you compare your experience in managing the online tutorial groups and the face-to-face sessions?

3. What is your general impression of using the *Interwise* system for teaching? What was good about using it? What was not good about using it?

4. Have you encountered any problems (e.g., technical, social, cultural) when conducting online tutorials? If so, what were they and how did you try to solve them?

5. How do you perceive your teaching role in online tutorials? Has the use of an online tutorial system changed your mode of teaching?

6. Do you think the organization of online tutorials has facilitated students' study of U123? Why/ why not?



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e-Learning in Higher Education Makes Its Debut in Cambodia: The Provincial Business Education Project

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Abstract

Developing countries face a number of challenges in their efforts to compete successfully in the new global economy. Perhaps the most critical resource needed to achieve these goals is trained human capital. While many developing countries are trying to address this need through traditional means, this may not be the most effective or efficient response. e-Learning has been suggested as an alternative approach that can overcome many of the challenges involved in reaching underserved students. But most educational institutions in developing countries are unfamiliar with e-Learning, have low levels of computer availability, access, familiarity and Internet penetration which leads to skepticism about the feasibility of this approach. In an effort to assess the potential of e-Learning in meeting the needs for developing human capital in Cambodia, this paper reports on the experience and achievements of the *Provincial Business Education through the Community Information Centers* (CICs) project. Key findings are that e-Learning was able to successfully deliver tertiary educational opportunities to underserved provincial students, Cambodian students were able to overcome serious challenges and that female Cambodian students demonstrated superior performance in online classes. These results suggest that e-Learning is an effective alternative for delivering tertiary education in Cambodia.

Keywords: e-Learning; distance learning; developing countries; Cambodia; information centers

e-Learning in Higher Education Makes Its Debut in Cambodia: The Provincial Business Education Project

The modern world is undergoing a fundamental transformation as the industrial society of the twentieth century rapidly gives way to the information society of the twenty-first century. This dynamic process promises a fundamental change in all aspects of our lives, including knowledge dissemination, social interaction, business practices, political engagement, media, education, health, leisure and entertainment (Sehrt, 2003).

Developing countries face numerous challenges as they strive to enter and successfully compete in the new global economy briefly described above. Although often blessed with the traditional

production factors of land and labor they are generally severely constrained by inadequate levels of physical and financial capital and, perhaps most important in today's knowledge-based economies, human capital.

Human capital, the quality of labor resources which can be improved through investments, education, and training, is fast becoming the key to success for both individuals and nations. But the means to develop this critical resource are expensive and difficult to provide in developing countries where educational systems are often weak and under funded, and access to education and training, limited and inequitable.

Addressing this situation through traditional means particularly for developing countries will be costly and potentially ineffective. As the recent United Nations Educational, Scientific and Cultural Organization (UNESCO) Meta-survey on the Use of Technologies in Education (2004) concluded,

More of the same is just not going to work. Building more classrooms, and training more teachers to reach those currently unreached by education systems is unrealistic and will not be enough to meet the Education for All (EFA) challenge. Some countries are already spending considerable percentages of their Gross Domestic Product on education and have little room for maneuvering. In addition, traditional education models will no doubt be unable to achieve educational empowerment effectively in the emerging Knowledge Societies (p. 1).

Just as important is that traditional means of educational development will only bring education in developing countries up to a point already being left behind by education in the more advanced knowledge economies (Wedel, 2000).

e-Learning is increasingly being suggested as an alternative to, or a way to enhance, traditional educational approaches. e-Learning is the most recent evolution of distance learning – a learning situation where instructors and learners are separated by distance, time or both. e-Learning (sometimes also defined as 'Internet-enabled learning'), uses network technologies to create, foster, deliver, and facilitate learning, anytime and anywhere. Potential advantages of this approach for developing countries are clear. e-Learning can match the needs of non-traditional students, increase the educational facilities available to traditional students, provide cost-efficient yet effective training options, and give learners in developing nations an invaluable means of gaining a first world education tempered by third world experience.

Although e-Learning is increasingly being adopted in developed countries to reach both traditional and non-traditional students, it is still relatively unknown and unused as an educational approach in developing countries. Reasons for this are numerous. There is a general skepticism about the effectiveness of e-Learning as compared to more traditional approaches. It takes specialized skills and knowledge to develop and implement online courses that are not generally found in most developing country educational institutions. Internet connections and phone lines are unreliable. Bandwidth is narrow resulting in slow access to websites. Computers in general are not widely available and Internet connected computers even more so, particularly in areas outside of major urban centers. Traditional approaches to teaching and learning may also be a factor. In many developing countries, students are most familiar with a didactic approach and do not necessarily understand the instructor as a 'facilitator' rather than as a 'teacher' in the traditional sense. Added to these factors is the relative and absolute higher cost of Internet access in

developing countries, most often as a result of misguided telecommunications regulations that discourage the development of Internet-access service through competition.

All of these impeding factors can certainly be found in Cambodia, one of the least developed countries in the world and now engaged in a critical effort to develop its human resources after decades of intellectual decay. In an effort to assess the potential of e-Learning as a mechanism for developing human capital in this country, a number of partners came together to implement the *Provincial Business Education through the Community Information Centers project* in Cambodia. This paper is a report on the activities and results of the project and an analysis of what was learned during and after project implementation.

Project Background

Cambodia is a country currently engaged in a concerted effort to overcome years of stagnation and decay as a result of political instability and war that “destroyed not only the physical infrastructure but the intellectual one as well” (Jones, *n.d.* ¶ 2). Probably more than any other single factor, success in this effort will depend on being able to redevelop the country’s educational system. It is widely recognized that, “as this conflict-scarred, largely agricultural country in Southeast Asia tries to rebuild itself, poor education remains a critical stumbling block, slowing down labour productivity and weakening Cambodia’s ability to create a sound economic base” (Chatterjee, 2006, ¶ 8).

The magnitude of this problem is severe. As Ashwill (2000) reports, the country’s educational system, a cornerstone of any viable society, is in shambles. According to the United Nations, of 1,000 Cambodians born today, 290 will never go to school, 390 will repeat the first grade, and 500 will not progress beyond the primary level. Only 27 out of 1,000 who enter primary school will graduate from high school. And the situation is, if anything, more grave in terms of higher education “with just 1.2 per cent of the population enrolled, compared with an average of 20.7 per cent in all the ASEAN [Association of South East Asian Nations] countries” (Cambodia Cultural Profile, 2005, ¶ 8).

The goal of the *Provincial Business Education through the Community Information Centers* project was to assess the utility of e-Learning as an approach to expanding the reach of educational opportunities in higher education in support of economic and social development. The importance of higher education in the development process is now recognized. As Bloom, Canning and Chan (2006) observe, while higher education is often considered to be “an expensive and inefficient public service that largely benefited the wealthy and privileged. Now it is understood to make a necessary contribution, in concert with other factors, to the success of national efforts to boost productivity, competitiveness and economic growth” (p. 4).

A key objective of the project was to determine if eLearning could address the challenges associated with reaching students outside of Phnom Penh. These provincial students represent the vast majority of Cambodia’s potential learners as less than 10 percent of Cambodians live in Phnom Penh Province (Census of Cambodia, 1998). Unfortunately, almost all opportunities for higher education are available only to those willing or able to move to the capital city and few provincial students are prepared, or can afford, to leave homes, families and jobs to move to the capital for extended periods.

The project was also interested in seeing if eLearning could work given the low level of familiarity with computers and computer technology. The vast majority of Cambodian students

have had very limited experience with computers. Of the 698 secondary schools, only 13 percent are connected to electricity, 8 percent have generators, and 4 percent have solar panels. Seventy-five percent have no power supply at all. Very few state schools have computers. Only six percent of lower-secondary schools and 35 percent of upper-secondary schools have between one and two computers for administrative purpose. Only eight upper-secondary schools have more than 10 computers (Cambodian Ministry of Education, Youth & Sport, *n.d.*). Computer availability is severely limited with 2.2 computers per 1,000 citizens, lower even than Papua New Guinea (13.7) and considerably behind the regional leader Malaysia (319.7) (Statistical Annexes, *n.d.*). Additionally, Internet penetration in Cambodia is extremely limited and currently estimated at only 0.3 percent of the population with most of this access is in Phnom Penh. By comparison, similar estimates of Internet penetration for the region are 9.9 percent and for the world 23.1 percent (Internet Usage in Asia, 2005).

Project Partners

This effort was part of a larger project funded by the United States Agency for International Development in Asia and the Near East (USAID/ ANE) through the dot-Gov Program and implemented by Internews Network, Inc. (www.internews.org) and The Asia Foundation (www.asiafoundation.org). A select number of Community Information Centers (CICs) (http://www.cambodiatic.org/about_project_en.asp) were responsible for providing Internet access, creating an enabling learning venue for students and helping students learn the Khmer e-Learning platform. The academic partner was the International Institute of Cambodia (IIC) (www.iic.edu.kh), an innovative leader in providing educational opportunities in the fields of business and Information and Communication Technologies in Cambodia. The non-profit Sustainable Development eLearning Network (SDLEARN) (www.sdlearn.net) provided on-line and face to face 'Train-the-Trainer' courses for IIC faculty and developed and provided an e-Learning platform which was then configured to use Khmer Unicode. This learning management system was then installed on servers maintained and provided by the Japanese Ministry of Agriculture, Forestry and Fisheries Information Network (<http://www.maffin.ad.jp/>). Additional support was provided by Khmer OS (www.khmerOS.info), a local NGO responsible for training IIC instructors, CIC staff and students in the use of the Khmer Unicode keyboard.

Project Development and Implementation

The project was carried out in a phased approach with the first phase focused on establishing an implementation plan that guided the activities of all the partners. In a consultative process, the project goals, objectives and partner responsibilities were refined. Particular attention was given to the needs of the instructors chosen to design and implement the eLearning courses to be made available. SDLEARN staff provided face to face consultation and guidance on online educational pedagogical theory, online course design and best practices in eLearning technology. They also ensured that the necessary infrastructure and personnel were available for the conversion of the existing paper-based materials into digital formats and assessed the suitability of the Community Information Centers as learning venues. Details of student identification, recruitment and orientation were discussed with IIC staff and administrators. It was also during this phase that all the partners agreed to use Khmer Unicode for course content and collaboration tools such as email, online discussion boards and chat rooms.

Experience has shown that there is no better way to learn how to design and implement an online course than to actually participate in one. Therefore, as part of phase 2, SDLEARN conducted a six-week online train-the-trainer course *e-Learning Course Design and Facilitation* for 25 IIC

faculty members. Participation in this course reinforced what had been covered in the face to face sessions with IIC and the hands on practice sessions gave participants exposure to SDLEARN's learning management system (LMS). The course focused on how to use the tools most commonly employed in an online learning environment, basic internet concepts, what it takes to succeed in an online course, what is expected of an online course facilitator, proven facilitation strategies, how to deal with common facilitation problems and how to design and develop an effective online course.

In addition to providing participants with the needed online teaching skills, an important outcome of this phase was the creation of a community consisting of those involved in the administration of the eLearning program and the course facilitators. This community provides an ongoing mechanism for sharing of information and a way to ask questions and receive answers and guidance from experts and peers.

Upon completion of the online course for the IIC faculty, the third phase dealt with logistical, administrative and technical details for designing and uploading the courses, promotion of the program, and recruitment of students. One hundred forty eight scholarships were awarded evenly to male and female students in five provinces: Banteay Meanchey, Kampong Cham, Kampong Som, Pailin, and Pursat. Scholarships covered tuition fees and five hours of free Internet access per week from the CICs. The three courses implemented and scholarships awarded are detailed in Table 1.

Table 1. First Round Scholarship Distribution by Course and Gender

Course Title	Number of Male	Number of Female	Total
Microeconomics	31	19	50
Principles of Marketing	23	27	50
Fundamental Accounting Principles	20	28	48
Total	74	74	148

Since this project was the first attempt at distance education and online learning in Cambodia, a one-day face to face orientation immediately followed selection of the scholarship recipients. This orientation was intended to introduce students to the online program, IIC, the roles and responsibilities of students, lecturers and CIC staff, and provide some technical guidance on how to sign up in the learning management system.

Upon the successful implementation of the three courses, a decision was made to offer four additional online courses, including two newly developed ones for students from Kampong Som, Kampong Cham, Pailin and Banteay Meanchey provinces. This was done to consolidate the notion of distance education in Cambodia and to capitalize on the momentum gathered from the first courses offered. To support this second round of course offerings and to build the capacity of IIC to continue to offer online courses in the future, SDLEARN conducted an additional

eLearning Course Design and Facilitation online course for 24 IIC faculty members. The four courses subsequently implemented by IIC faculty and scholarships awarded are detailed in Table 2.

Table 2. Second Round Scholarship Distribution by Course and Gender

Course Title	Number of Male	Number of Female	Total
Principles of Marketing	11	8	19
Introduction to Business	4	3	7
Fundamentals of Management	31	16	47
Fundamental Accounting Principles	23	24	47
Total	69	51	120

Based on experience gained during the implementation of the first round of courses, a number of adjustments were made in the way the second round was conducted. Promotional and recruitment activities were expanded and targeted at potential candidates who better fit the profile of successful students. These were identified as women, recent high school graduates and people not fully employed. The orientation program was also extended to one week to better prepare students for the online learning. Students were given a longer time to practice typing in Khmer Unicode with the Khmer keyboard and get accustomed to the LMS. Another activity added was the training of CIC staff to provide them the necessary skills and knowledge to better support the students. This was done in recognition of the important role that they played in keeping the students motivated and on-track in the online courses.

A major effort was made throughout the project to monitor, document and evaluate progress and outcomes. During the implementation of the courses, SDLEARN staff and a Khmer education consultant carefully monitored project activities and student reactions and the difficulties they encountered. IIC staff conducted regular assessments of student performance and awarded numerical grades based on assignments and examinations. Two formal evaluations of the project were also conducted by SilkRoad Cambodia (www.silkroadcambodia.com/) one at the end of Round 1 and the other at the end of the project. These evaluations involved extensive face to face and phone interviews with students and other stakeholders (Hutchinson, 2005).

Results and Discussion

Under this project, two 'semesters' of online business courses were delivered to students in five provinces. Two hundred eleven ($n = 211$) out of a starting group of 272 Cambodian students successfully completed one or more of the five online courses developed under the project. A description of these students and their performance in both Round 1 and Round 2 is provided in Table 3.

Table 3. Characteristics and Performance of Students Who Registered for Project eLearning Courses

Age Group	F	M	Total		F	M	Total
< 20	19	8	27		15	9	24
21-25	49	43	92		27	23	50
26-30	4	19	23		2	19	21
> 31		4	4			10	10
Missing value	5	1	6		7	8	15
Mean age	22	24	23		22	26	24
Total	77	75	152		51	69	120
Occupation	F	M	Total		F	M	Total
Student	44	28	72		32	25	57
Working	28	46	74		19	44	63
Missing value	5	1	6		0	0	0
Total	77	75	152		51	69	120
Grade	F	M	Total		F	M	Total
A	13	3	16		13	15	28
B	19	18	37		19	21	40
C	18	9	27		8	16	24
D	13	16	29		6	4	10
Fail	4	9	13		5	13	18
Incomplete	10	20	30		0	0	0
Total	77	75	152		51	69	120

Despite the disadvantages faced by these students their performance and achievements were considered to be excellent. Dropout rates were low at 20 percent in Round 1; and 0 percent in Round 2, which compares favorably with online students in more technologically advanced higher education settings in developed countries. (Carr, 2000; Dublin, 2003; Flood, 2002; Nash, 2005). More than 75 percent of these students received passing grades which was similar to other Cambodian students at IIC enrolled in traditional classroom sessions.

The views of D'Antoni's about the critical importance of the '4 A's' of e-Learning (as cited in Daniel, West, D'Antoni, & Uvalic-Trumbic, 2005) seem to provide a basis for explaining why these students did so well. D'Antoni contends that if courses are easily accessible, the content is appropriate, participation is rewarded with formal accreditation and learning is affordable, the chances of success are significantly increased. In the case of this project, a concerted effort was made to ensure all four criteria were met.

The CICs were the main mechanism to ensure accessibility in terms of hardware, software and internet connectivity as well as in the equally important area of helping inexperienced users become familiar with the technology. They provided a comfortable learning environment that is not generally available in most provincial towns and expert technical and even pedagogical support. The importance of the contributions of the CICs and CIC staff was recognized by students who indicated that they considered CIC staff instrumental in creating a supportive learning environment. Ninety eight percent of the surveyed students rated the CICs as helpful or extremely helpful in the level of support provided and the connectivity they offered (Hutchinson, 2005).

All of the courses implemented under this project were delivered, monitored and accredited by a well respected university in Cambodia. Students who successfully completed all the course requirements and who scored sufficiently high on assignments and tests were awarded with a formal certificate from the International Institute of Cambodia and eligible for university credit toward a degree.

The course content was certainly appropriate given the needs of the country and the interests of the students in improving their career prospects. The change to a market economy since 1993 has facilitated the growth of private higher education establishments where some of the most popular courses offered are in ICT related subjects, foreign languages and business (Cambodian Ministry of Education, Youth & Sport, *n.d.*). The importance of the subject matter was confirmed by alumni feedback with more than 85 percent of students indicating that they felt that their participation in an online business course had helped their job prospects (Hutchinson, 2005). That the content and interaction was all in the local language Khmer must also be recognized as a factor. The development of a Learning Management System that allowed the use of Khmer Unicode for content delivery and communication was instrumental in making this possible.

Every attempt was made to make these students' first introduction to e-Learning affordable which in Cambodia is primarily related to the prohibitively high cost of internet access. Internet access costs in Cambodia are the third highest in the Asia-Pacific region at an average of US \$85.40 per month (compare with Singapore at \$10.56). Moreover, given the disparities in wealth between countries this absolute greater price is even more of a constraint. For example, in Singapore, Internet access is equivalent to 0.5 percent of monthly GDP per capita. In Cambodia, Internet access costs almost four times the average monthly income (Nicol, 2003). In the first round, all students competed for full scholarships covered by project funds covering tuition fees and five

hours per week of free Internet access through the CICs. In Round 2, two types of scholarships were awarded – full as well as partial scholarships which covered 50 percent of the total costs.

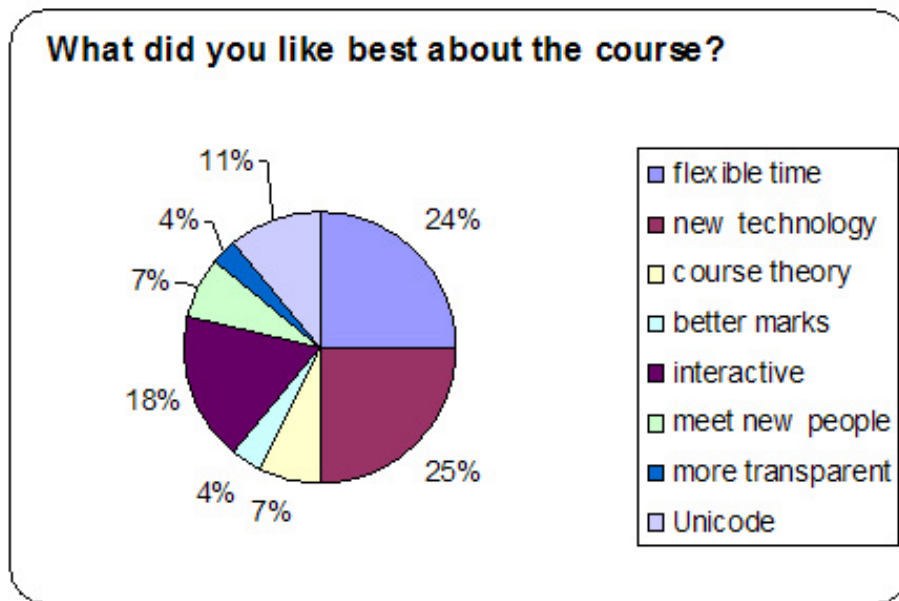
In addition to the general factors mentioned by D’Antoni, there were also several factors perhaps unique to Cambodia that were considered to have contributed to the success of the project. It must be recognized that, for students living outside of Phnom Penh, online courses represent the only real option for accessing accredited, higher education learning opportunities. Cambodian students in the provinces have extremely limited choice and if they cannot move to Phnom Penh for extended periods they are essentially denied access. This is even more of a problem for provincial women whose mobility is even more constrained than their male counterparts. Even from their early years, “For reasons on personal security, girls are not allowed to travel long distances and live away from family to attend upper secondary schools in provincial towns” (Ledgerwood, *n.d.*, ¶ 14). This situation remains even after women graduate from upper secondary school and represents a major impediment for women interested in pursuing higher education. Partly as a result of this inequity, women represent less than one third of the total population of higher education students in Cambodia (Mak, 2005). That women represented half of the participants in this project suggests that women are as interested as men in enhancing their economic futures by furthering their education. Additional evidence for the attractiveness of online learning for provincial Cambodian women can be found in their performance which was higher than that of their male classmates. A *t-test* on the final grades earned by all the students from the two rounds of courses showed that women’s mean final grades were significantly higher than men’s as measured by performance on assignments and a mid-term and final examination (see Table 4).

Table 4. Result of t-test on the Final Grades of All Students

Round	Female			Male			<i>t-value</i>
	N	Mean	SD	N	Mean	SD	
Round 1	67	70.897	16.8426	55	61.3000	22.9257	-2.58436**
Round 2	51	68.918	22.0937	69	58.3925	28.4163	-2.28195*
* p < .05							
** p < .01							

Survey results provided some additional reasons for the high student achievement and completion rates. These included students’ appreciation of the ability to learn about and use technology and the flexibility online learning allows. In the survey of graduates, 25 percent cited the technological nature of the delivery system as one of the things they liked best about the course. Almost equally valued was that the online format allowed them to study in their own time suited to their individual schedules. Flexibility was cited as a desirable factor by 24 percent of the survey respondents. Interestingly, only seven percent of graduates indicated that they liked learning the actual course content and theory (see Figure 1).

Figure 1. Characteristics of online courses most appreciated by students



Finally, some credit has to be given to the local and international partners behind the design and implementation of the project. They demonstrated a clear understanding of individual comparative advantages, roles and responsibilities and an understanding of student needs and circumstances. They recognized the importance of close monitoring and documentation of project activities and results and were able to modify activities during implementation based on student and partner feedback. That dropout rates declined to 0 percent in Round 2 can be credited to a large degree to partners adjusting the emphasis given to student orientation before the courses started and to more comprehensive on-site support during the semester.

Summary and Conclusions

The *Provincial Business Education through the Community Information Centers (CICs) project* was an ambitious effort to use e-Learning to reach underserved provincial students in Cambodia with quality accredited educational opportunities in business theory and skills. Over a period of 18 months, project partners successfully delivered two 'semesters' of online business courses in Khmer language to students residing in five provinces outside Phnom Penh. Key outputs included the establishment of a distance learning program at the International Institute of Cambodia, the creation of a core group of experienced online course developers and facilitators, experienced student support personnel at the Community Information Centers, an open source Khmer language Learning Management System based on Khmer Unicode standards, and the establishment of a strong network of mutually supportive partners. Two hundred seventy two ($n = 272$) provincial Cambodian students took advantage of one or more of the five online courses developed under the project to improve their knowledge of key business topics and over 75 percent of these individuals scored sufficiently high on exams and assignments to receive accredited certification. These results strongly suggest that e-Learning can be a successful approach to providing quality higher education to underserved provincial students in Cambodia, and that this approach can open new opportunities for educational institutions to reach out to underserved women and men in Cambodia via online courses.

Key factors associated with these results were that the courses met the most critical standards for success. Every attempt was made to ensure that they were easily accessible, the content was appropriate, participation was rewarded with formal accreditation and the learning was affordable.

Other contributing factors identified by students were that online learning gave added value in that eLearning allowed students to develop IT skills while also learning subject matter related business. Participation in these courses provided an opportunity to learn how to use computers and digital communication tools. This finding tends to confirm the ideas of Wedel (2000) who noted that,

A key advantage to using technology for education is that the use of technology is in itself a crucial education. Computers and the Internet are particularly suited for self-learning and for many other uses. So, for example, by learning to use the Internet to take a course in history, the student also learns language and Internet skills that will be valuable for finding international markets for local handicrafts or getting the latest crop prices on world markets (p. 2).

Given that nearly half of the students were working adults, it is not surprising that a much appreciated aspect of the courses was its flexibility in allowing learners to study at the times most convenient to their schedules. Without this flexibility, many of these students would not otherwise have been able to participate in a formal learning program.

These factors, however, are not so different from what makes e-Learning work anywhere else in the world. In the context of Cambodia, and for students living outside of Phnom Penh in particular, a major factor has to be that these courses represented the only opportunity for provincial students to further their education. That they could continue their education without leaving home seemed to be an especially attractive aspect of e-Learning for provincial women learners. While women currently represent less than one third of the total population of higher education students in Cambodia nearly 50 percent of the students who registered for and participated in the online courses were women. Women definitely demonstrated their ability to learn online and scored significantly higher on tests and assignments than their male classmates.

While there are still major difficulties to overcome and much work to be done, it is maintained that the results of this project provide strong evidence that eLearning can be a powerful approach for reaching underserved men and women learners living in the country's provinces. Perhaps the most serious impediment to more widespread adoption of eLearning will be the prohibitive cost of internet access. Survey responses showed that students would be willing to pay between US \$20 to \$30 for an accredited course and that they would be unwilling to pay extra for Internet access. Whether or not this level of effective demand will be economically attractive for educational institutions or if there are feasible options for providing affordable internet access is not yet known. There is definitely a real danger that, "Unless access can be subsidized, either by donors or the government through a universal access policy the full potential of online learning in Cambodia will remain underutilized" (Tweedie, 2006, p. 8).

It is certainly hoped that the country will overcome this and other constraints as there is strong evidence that e-Learning can and does work in Cambodia and perhaps in other countries facing similar challenges. As stated in an article published in the United Nations Chronicle:

If education and capacity-building are critical steps for entering into the new global economy, e-learning should be considered a critical facet of basic development, an alternative medium of capacity-building and a means to people's empowerment (Sehrt, 2003, ¶ 7).

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The Current Status and Future Prospects of Corporate e-Learning in Korea

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Abstract

Corporate e-Learning in Korea has grown rapidly over the previous six years (2000-2005). This study argues that the main cause of this heightened interest in corporate e-Learning in Korea was not that companies needed to provide high-quality training programs through the Internet, but rather that the government took initiative to transform the state into an information-based society. The policies for quantitative growth with minimum levels of quality and uniformity have been dominant and have resulted in the lack of diverse e-Learning types for authentic practices in workplaces. This paper suggests that in order to cope with the new competency requirements of employees, corporate e-Learning should be guided both by governmental support and by company initiative.

Keywords: Corporate e-Learning; Korea

Introduction

Open and distance learning in Korea had not been fully implemented and discussed prior to 2000. Until then, and since 1972, systematic formal education for adult learners who did not have the opportunities to enter more traditional colleges had only been provided at such a mega university as the Korean National Open University (KNOU). Traditional, face-to-face education had been the dominant mode of teaching, while distance learning made up only a small portion of the Korean educational system. However, nine cyber universities, which were established in 2001, and the new Internet correspondence training policy for corporate e-Learning by the Ministry of Labor in 1999, initiated profound changes in the Korean educational system (Lim, 2003). Today, many Korean adult learners can pursue education through the various distance learning technologies. Online college courses are delivered via printed material, radio, television, MP3, portable multimedia players (PMP), and the Internet. Also, at present, distance corporate training programs are delivered by mail and online as e-Learning.

The unprecedented growth of corporate e-Learning in Korea has been a major feature of distance learning since 2000. The Korean Ministry of Labor reported that the growth rate of Internet correspondence training participants was 6,281 percent over the past six years (19,653 in 1999 and 1,254,066 in 2005) (Ministry of Commerce, Industry and Energy, Korea Institute for Electronic Commerce, & Korea Association of Convergence Education, 2006). While this astronomical figure can be explained in many ways (Lee, 2006) with positive results, its negative effects on corporate e-Learning and distance learning have also been noted.

This study intends to discuss the causes and effects of the rapid growth, as well as explore directions for future research and practice with regard to corporate e-Learning in Korea. To determine the current issues, the study focuses on the significant developments implemented by a government-funded research center, the Korean Research Institute for Vocational Education & Training (KRIVET), over the past six years (2000-2005). KRIVET's impact on the development of corporate e-Learning can hardly be overstated (Lee, 2006). The causes of those developments and various resulting problems are examined in this paper. Finally, based upon this analysis, future directions are suggested.

Current Developments in Corporate e-Learning in Korea: 2000 ~ 2005

Corporate e-Learning in Korea developed in earnest following the implementation of a new government policy in 1999 on Internet correspondence training. Since then, the development of the field can be measured in five ways: rapid quantitative growth, government initiatives, dominance of the tutorial mode, quality assurance, and high adoption rates among large corporations. These will be discussed in turn.

Rapid quantitative growth

One of the salient features of corporate e-Learning in Korea over the past years has been its rapid quantitative growth. In Table 1, it may be observed that the number of employees who participated in the Internet correspondence training program or e-Learning greatly increased from 19,653 in 1999 to 1,254,066 in 2005 (approximately 63.8 times more). In 1999, only 2.5 percent of the total number of trainees participated in Internet correspondence training. But in 2005, that ratio increased up to nearly half of the total number of trainees, to 46.4 percent, in 2005.

Table 1. Number of Trainees Supported by Employment Insurance Act (1999-2005)

Year	Internet-Based		Postal-Based		Classroom-Based		Total		Internet Training Rate (A/B*100)
	Trainees (A)	Increase rate	Trainees	Increase rate	Trainees	Increase rate	Trainees (B)	Increase rate	
1999	19,653	-	85,055	-	676,700	-	781,408	-	2.5%
2000	137,712	600.7%	161,825	90.3%	920,797	36.1%	1,220,334	56.2	11.3%
2001	406,159	194.9%	199,242	23.1%	950,001	3.2%	1,555,402	27.5	26.1%
2002	543,320	33.8%	197,045	-1.1%	843,958	-11.9%	1,584,823	1.9	34.3%
2003	629,930	15.9%	193,570	-1.8%	838,478	0.7%	1,661,978	4.9	37.9%
2004	929,771	47.6%	283,338	46.4%	790,354	-5.7%	2,003,463	20.6	46.4%
2005*	1,254,066	34.9%	339,645	19.9%	1,171,630	48.2%	2,705,341	35.0	46.4%

Source: Ministry of Commerce et al. (2006). E-learning White Paper 2005-2006.

* The number of trainees in 2005 is projected on the data from the Ministry of Labor in Oct. 2005.

This high growth was due to the expansion of the Employment Insurance Act, which earmarked financial support for e-Learning programs. This legislation allowed the Ministry of Labor to

begin in 1999 providing institutional support. Thus, the number of corporations and workers that participated in e-Learning increased rapidly over the previous 5-6 years. Moreover, corporations took advantage of e-Learning, giving more employees access to educational opportunities at relatively low cost. Large corporations quickly adopted the e-Learning systems and invested money to develop programs.

The rapid growth of corporate e-Learning in Korea can also be attributed to an increase in theoretical studies on corporate e-Learning. One of the leading journals on corporate training in Korea is the *Journal of Corporate Education*. This academic journal published its first volume in 1998 in the area of training methods, focusing especially on the applications of different technologies and programs. Not surprisingly, the journal has discussed e-Learning with regular frequency since 1999. Of the 13 volumes of the journal, 26 of 79 articles (33%) have dealt directly with the subject of corporate e-Learning. Considering the plethora of educational methods and issues in corporate training that could be discussed, devoting over 30 percent of the journal articles to e-Learning is doubtlessly a testament to the rapid quantitative growth of the field, as well as the high level of theoretical interest it has garnered in Korea.

Government initiatives on corporate e-Learning

The Korean Government, especially the Ministry of Labor, has played a significant role in developing the field of corporate e-Learning. In accordance with the government's strategic plan hatched in the mid-1990s to transform the country into a knowledge-based information society, the Ministry of Labor has been the primary driving force behind the implementation of e-Learning for corporate training since 1998. That year the Ministry of Labor initiated a pilot project that tested e-Learning based training courses, a project that led to the conclusion that correspondence training should include both Internet correspondence training and postal correspondence training, and which resulted in expansions the following year. This decision caused both corporate e-Learning and distance learning for adults to grow rapidly in Korea in 2000 (see Table 1). Furthermore, as alluded to previously, the Ministry of Labor established a special division, the e-Learning Center at KRIVET, to monitor the quality standards of the e-Learning institutes and of the Internet correspondence training program, as well as to establish a new support system and make recommendations.

In addition to these early initiatives of the Ministry of Labor, subsequent measures and policies have also been implemented since 2000 to boost corporate e-Learning (Lee, 2006). In order to support corporate e-Learning on a long-term basis, the Ministry of Labor and the e-Learning Center at KRIVET developed the Corporate e-Learning Mid-Period Development Plan, 2004-2008, which proposed strategies covering various aspects of e-Learning such as servicing and maintenance of the system, infrastructure construction, cultivation of human resources, standardization, and quality control. Recently, Internet correspondence training regulations have also been revised to incorporate 'blended learning' and a scaled training fee structure, based on an analysis of the quality of the e-Learning institutes. Lastly, the worker's tuition support system has been modified as well so that individual workers can receive financial support when they register independently for e-Learning programs.

Dominance of tutorial e-Learning

Most corporate e-Learning courses in Korea are in tutorial format in which major points are supplemented with elaborations and examples ('Intro' and 'Lesson' in Figure 1) followed by practice problems ('Activity' in Figure 1). Various design strategies have been applied – for

example, Keller's ARCS (Attention, Relevance, Confidence, Satisfaction) model has been adopted to enhance effectiveness and for animated presentations advanced technologies, such as *Flash*, have become standard authoring tools.

Figure 1. An Example of e-Learning: Tutorial type



Table 2 shows that nearly 90 percent of all e-Learning content in 2005 were tutorials in either HTML or Lecture-on-Demand (LOD) format. The remaining 10 percent were simulations that honed technical skills. As these two types – tutorials and simulations – became so ubiquitous over the past three years in the field of corporate e-Learning, the government's Employment Insurance Fund eventually dropped support for other types of e-Learning programs.

Table 2. e-Learning Program Proportion by Types from 2003 to 2005

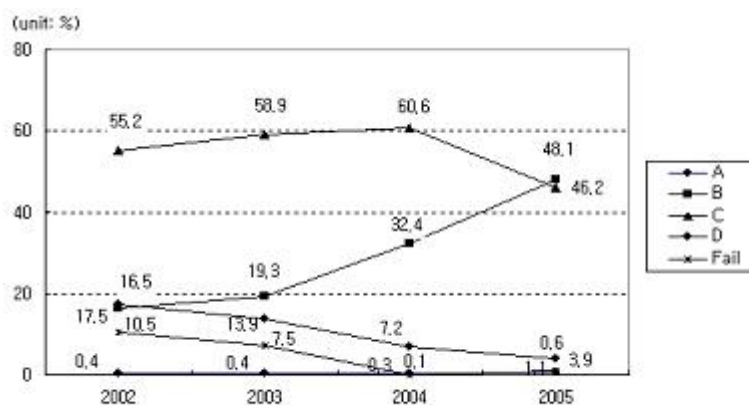
Types		2003		2004		2005	
		Self developing	Outsourcing	Self developing	Outsourcing	Self developing	Outsourcing
Tutorial	HTML	545 (88.0)	1,086 (79.3)	738 (88.0)	1,005 (68.6)	742 (79.7)	1,082 (80.8)
	LOD	26 (4.2)	212 (15.5)	33 (3.9)	315 (21.5)	83 (8.9)	138 (10.3)
Simulation		48 (7.8)	72 (5.3)	68 (8.1)	146 (10.0)	106 (11.4)	119 (8.9)
Total		619 (100.0%)	1,370 (100.0%)	839 (100.0%)	1,466 (100.0%)	931 (100.0%)	1,339 (100.0%)

Source: Lee, S. et al. (2006). *Evaluation of Internet Correspondence Training Institutes, Year 2005*. Seoul: KRIVET

Quality assurance

The Korean Government, and the Ministry of Labor in particular, has tried to assure e-Learning quality over the previous years. In 2002, the e-Learning Center at KRIVET launched an assessment system to judge the appropriateness of Internet correspondence training programs. All e-Learning programs supported by the Employment Insurance Fund were required to be evaluated by the Center. As seen in Figure 2, the B level grew annually from 16.5 percent in 2002 to 48.1 percent in 2005, demonstrating that instructional design and content quality were, indeed, improved. Conversely, the proportion of D and F level steadily decreased from 27.5 percent in 2002 to 5 percent in 2005. The quality of the e-Learning programs was successfully improved by implementing the assessment system.

Figure 2. e-Learning Program Assessment Results (2002-2005)



Source: Ministry of Commerce et al. (2006). *E-Learning White Paper 2005-2006*.

High adoption rate in large companies

Participation in corporate e-Learning programs was not been evenly distributed across the corporate sector. Employees of larger corporations comprise the largest proportion of Internet correspondence training system participants. Table 3 shows that in 2004, just 8 percent of training participants from assembly lines in small and medium companies participated in Internet correspondence training programs, while nearly 30 percent of those from large companies did so.

Table 3. The Proportion of Training Types for Assembly Line Workers by Company Size

Company Size	Classroom Training		Internet Training		Postal Training		Small & Medium Company Consortium		Field training		Total	
	Programs	Trainees	Programs	Trainees	Programs	Trainees	Programs	Trainees	Programs	Trainees	Programs	Trainees
Small and Medium	1,847 (71.3%)	14,432 (69.27%)	432 (16.8%)	1,877 (8.2%)	300 (11.6%)	6,386 (28%)	3 (0.1%)	22 (0.1%)	8 (0.3%)	90 (0.4%)	2,590	22,807
Large	4,561 (69.4%)	68,565 (58.5%)	1,145 (17.4%)	34,294 (29.2%)	865 (13.2%)	14,401 (12.3%)	1 (0.02%)	1 (0%)	4 (0.1%)	6 (0%)	6,576	117,267

Source: Ministry of Labor, *Unemployment insurance DB*, 2004.

Table 4 further shows that the implementation ratio decreases significantly in relation to smaller company size. In small companies (less than 50 employees), only 10.3 percent of workers participated, whereas 52.4 percent of employees did so in large companies (140-299 employees) (Jang & Yoo, 2006).

Table 4. e-Learning Program Proportion Change by Company Size in 2006

Category		Company Size			Total	Difference
		Less than 50 Workers	50 Workers to Less than 149 Workers	150 Workers to Less than 299 Workers		
e-Learning Program	Yes	8 (10.3)	15 (24.6)	22 (52.4)	45 (24.9)	$\chi^2=23.938$ $p<.01$
	No	70 (89.7)	46 (75.4)	20 (47.6)	136 (75.10)	
total		78 (100.0)	61 (100.0)	42 (100.0)	181 (100.0)	

Source: Jang, M. H., & Yoo, S. J. (2006). E-Learning Needs Analysis for the Employees of Medium and Small Companies. *Journal of Vocational Education & Training*, 9(3), 175-202.

At first glance, the Internet correspondence training system appears to provide broader access to educational opportunities in Korea. It seems to put training within reach of those employees who would not otherwise engage in such an opportunity. In reality, however, it fails to achieve that goal. Assembly line workers and those employed by small- or medium-sized companies have not received equal opportunities for the Internet correspondence training.

Issues in Corporate e-Learning in Korea

Although there have been great developments in corporate e-Learning in Korea over the past six years, there remain certain key problems in the field: moderate quality, uniformity and controlled growth, limited evaluation criteria, and unevenly distributed adoption rates.

Moderate quality of corporate e-Learning

The quality of corporate e-Learning has become an issue that has only been compounded by rapid growth. As mentioned, since the 1999 introduction of e-Learning in Korea two formats have emerged as preeminent: one is LOD (Lecture-on-demand) in which the presentation of a lecturer is recorded in motion picture, and the other is Web-based instruction in which text, graphic, and some animated objects are displayed on webpages as the learners click to progress. LOD has become a dominant format because not only it was easy and relatively inexpensive to develop, but it also conformed to expectations of what training should be (i.e., lecture delivery at learners' convenience). A small percentage of e-Learning was developed as Web-based instruction and most of this type were just copies of printed materials without learners' active participation. These problems were partially remedied when the new assessment system was introduced in 2001. As Table 5 illustrates, growth stalled in 2002 (the number of total institutes decreased from 110 to 93) with the introduction of governmental regulations, of which the assessment system was a key provision. The system succeeded in upgrading the quality of tutorial-type e-Learning programs at the expense of other formats. The quality issue will be discussed in more detail in the latter portion of the quality assurance section.

Table 5. Number and Increasing rate of Corporate e-Learning Institutes in Korea (2001-2005)

Year	Self-developing		Outsourcing		Total	
	Institutes	Increasing rate	Institutes	Increasing rate	Institutes	Increasing rate
2001	56	-	54	-	110	-
2002	57	1.8%	36	-50.0%	93	-18.3%
2003	55	-3.6%	33	-9.1%	88	-5.7%
2004	53	-3.8%	55	40.0%	108	18.5%
2005	68	22.1%	80	31.3%	148	37.0%

Source: Ministry of Commerce et al. (2006). *E-learning White Paper 2005-2006*.

- Notes: 1. If a company provides both intra-company and outsourcing programs, it will be estimated as outsourcing training.
 2. The number of companies conducting more than one training per year.

Uniformity and controlled growth

The government initiative on corporate e-Learning in Korea has yielded unexpected results. Although it stimulated the quantitative increase of corporate e-Learning programs in a short period of time, one mode of e-Learning – the tutorial – dominated the e-Learning landscape. While the Evaluation System for Contents and Design Quality of e-Learning by the e-Learning Center (see Table 7) succeeded in upgrading the basic quality of the tutorials, it failed to encourage the development of diverse modes of e-Learning programs beyond simple tutorials, and also neglected to support new ideas and studies to help e-Learners become self-regulated or self-directed (Lim, 2005). Many e-Learners did not successfully complete the e-Learning programs in which they had enrolled; they dropped off early on or midway through because they were not self-motivated.

Although tutorial is an effective instructional type for certain objectives, it cannot support some essential objectives and activities, including teaching problem-solving skills, creative thinking skills, and self-directed learning. Yet these are the very skills and experience expected of workers in Korea’s knowledge-based society. Corporate e-Learning in Korea, however, currently has not successfully promoted different e-Learning models such as Problem-Based Learning, Goal-Based Scenario, and Case-Based Learning (Kang, Kang, Song, Cho & Lim, et al., 2006).

In addition, the government, by virtue of their initiative, regulated the growth of e-Learning in a way that stifled spontaneous innovation. Most companies assumed a passive role in designing and developing other types of e-Learning. The rapid growth of e-Learning was achieved without autonomous efforts from the corporate sector. For instance, the possibility of integrating e-Learning with the knowledge management system in a company (Rosenberg, 2001) or with long-term blended learning strategies has not been systematically examined, in spite of the high demand.

On the other hand, some alternative designs have been explored from a theoretical standpoint. The *Journal of Corporate Education* in Korea has treated many topics related to course design, and secondly, to learner support and cost issues when those articles from the journal were analyzed by an analytical framework of Rha and Han (2002) (see Table 6). As this journal mainly focuses on the educational methods in corporate training, especially from the perspective of educational technology, this is not an unexpected result. The course design topics covered in the articles included ‘strategies for learning motivation in e-Learning,’ ‘design strategies for goal-based scenarios,’ ‘blended learning strategies,’ and ‘a design model for e-Learning.’ On the other

hand, as e-Learning is relatively new to adult workers, learner support issues have been widely discussed. The issue of cost has also been examined because the corporate sector has been particularly interested in determining whether e-Learning is cost-effective.

Table 6. The Topics of e-Learning Studies in Korea (1998-2006)

Topics	Frequency	Ratio
Course Design	11	42.3%
Learner support	6	23.1%
Cost	4	15.4%
Learner participation	3	11.5%
Learning Contents	1	3.8%
Other	1	3.8%
Total	26	100.0%

Note: The articles from the *Journal of Corporate Education* in Korea were selected for examination

In addition to the *Journal of Corporate Education* other academic journals and periodicals have also discussed topics related to e-Learning design. The *Journal of Educational Technology* in Korea, for example, has dealt with issues of corporate e-Learning from the perspective of educational technology, notably, issues such as tutoring (Cho & Lee, 2004) and supporting self-regulation (Lim, 2005) have been areas of recent focus.

Limited evaluation criteria

It can be argued that the current perception of quality of corporate e-Learning can be attributed to the narrow and ambiguous evaluation criteria. Table 7 shows the current evaluation criteria for e-Learning programs. It consists of five dimensions: instructional design, interaction, evaluation, instructional support design, and technology. Whereas the dimensions and the sub-criteria do cover important quality aspects of e-Learning programs, some problems still exist. First, they focus too narrowly on evaluating the tutorial type of e-Learning, virtually assuming that the tutorial format is the only one to assess; other types of e-Learning programs such as Case-Based Learning (CBL) or simulation have not been easily evaluated under these criteria. Second, they do not provide specific guidelines for each criterion. The criteria were ambiguous and judgment could vary depending on the evaluator. More specific guidelines in a rubric format should be developed to make the evaluation more objective and effective for future e-Learning programs.

Table 7. The Evaluation Criteria for e-Learning Programs

Dimensions	Criteria
Instruction Design	Content presentation strategy and method relevancy
	Suitability for supplementary & advanced learning resources
Interaction	Appropriateness of learner-instructor interaction
	Appropriateness of learner-learner interaction
	Appropriateness of learner- contents interaction
	Appropriateness of learner-program manager interaction
Evaluation	Appropriateness of method
Instructional Support Design	Appropriateness of help function
	Connectivity of navigation (Interface)
Technology	Technical stability

Source: e-Learning Center in KRIVET (2006)

Unevenly distributed adoption rates

As noted previously, the implementation of corporate e-Learning in Korea has mostly been confined to larger companies. Employees of small- and medium-sized companies have not yet fully experienced e-Learning programs. To overcome this shortfall, the Ministry of Labor's worker's tuition support system has been recently revised to provide financial support for these underserved workers (Lee, 2006). Further consideration in terms of more access to Internet correspondence training system is needed in order to improve corporate e-Learning in Korea.

From a theoretical vantage point, selected studies in the *Journal of Vocational Education & Training* by KRIVET have discussed the issue of supporting medium and small companies, such as by beginning with an e-Learning needs analysis of these companies (Jang & Yoo, 2006) and an assessment of e-Learning course selection criteria (Kwon, Lee, Rha, & Lim., 2006). These studies were mainly conducted to come up with political implications for the future of e-Learning implementations at the national level.

Conclusions: Future directions and prospects

The current development of corporate e-Learning in Korea was examined in terms of five aspects: 1) rapid quantitative growth, 2) government initiative, 3) dominance of the tutorial mode, 4) quality assurance, and 5) high adoption rate among large corporations. Each one of these also has a corresponding weakness. Rapid quantitative growth has meant that quality has at best been moderate. Government initiative has fueled complacency as companies have hesitated to develop their own e-Learning programs for specific purposes such as problem-solving or creative thinking skills. The dominance of the tutorial mode has kept other types of e-Learning from being actively designed and implemented. Quality assurance measures have used evaluation criteria so narrow and ambiguous that other types of e-Learning contents could not be easily evaluated and the evaluation was susceptible to subjective influence. And finally, the high adoption rate among large corporations has translated into workers of small and medium companies not having equal opportunities.

Nevertheless, corporate e-Learning does seem to have had a great impact on the recent development of life-long education and distance education in Korea. While the ratio of participants in life-long education in Korea has been relatively low among OECD countries (OECD, 2000), corporate e-Learning has played an important role in increasing the rate of participation rate in a short period of time. This increase was mainly due to the government initiative to transform the state into an information-based society where all the aspects of government, including education and training systems, rely on information infrastructure and environments. The Ministry of Labor was no exception, and it took advantage of the Employment Insurance Fund to achieve its goal for contributing to the information-based society. Companies were permitted to ask for government subsidy as long as they provided e-Learning programs for their employees. Implemented in 2000, this allowance had a significant effect on the growth of corporate e-Learning.

In this respect, corporate e-Learning in Korea is both unique and distinctive. The main impetus for its rapid growth has not been that companies needed to provide high-quality training programs to more workers, but that the government took initiative to transform the nation into an information-based society. Most e-Learning programs were tutorials that could be made easily, and their common objectives were for acquiring knowledge or understanding content (Lee, Byun, Kwon, & Hwan, 2006). Companies wanted to ensure that employees could do their work competitively or show competency in new areas. They did not want any more workers who just understand basic, factual knowledge. Competency-related e-Learning or performance-based e-Learning, however, has not been fully examined yet.

Corporate e-Learning can be improved in two ways. First, it should be dynamic rather than static, serving the new requirements of companies and employees. If it remains confined to traditional modes of education or schooling where understanding knowledge can be acceptable as an educational goal, it will be criticized and eventually phased out. It should be responsive to demands for new skills, competencies, or performance, training objectives that can improve employee effectiveness and efficiency. Therefore, the current government e-Learning initiative should be changed into one that is directed by both government and companies, one in which companies play an active, executive role and have a vested interest. Each company should be encouraged to develop and implement advanced and authentic programs autonomously, programs such as an e-Learning version of Problem-Based Learning or Case-Based Learning (Kang & Oh, 2006). Evaluation criteria should also become more inclusive and go beyond examining the

components of the tutorial; it should stimulate new trials and developments of corporate e-Learning programs.

Second, corporate e-Learning is a kind of distance learning. Theoretically this provides more possibility to help adult learners access education and training opportunities. Corporate e-Learning can provide training to employees who might otherwise never have had the opportunity to train because of time and space constraints. The initial implementation of corporate e-Learning was geared toward large corporations such as *Samsung*, *LG*, and *SK*. These corporations were relatively eager to adopt the program because they considered e-Learning to be cost-effective and to provide more training for their employees (Jang & Yoo, 2006). Yet small- and mid-sized companies were not able to offer these programs due to financial constraints. Moreover, they did not recognize the value of e-Learning for their workers. To solve this inequality problem, the government should play a key role in encouraging the implementation of e-Learning. The Bureau of Small- and Mid-Sized Companies in the Ministry of Labor must come up with effective strategies to mitigate the imbalance, while the consortium of affected companies should take ownership of implementing e-Learning. In addition, government and companies should collaborate to provide leadership aimed at providing opportunities for the disadvantaged employees of these companies.

As mentioned, the unequal access to e-Learning should be acknowledged and countermeasures to provide more equal opportunities should be devised, especially for employees for whom e-Learning is relatively new (Piskurich, 2003; Lim, 2005). Considering their schooling experience that focused on passive learning, it is easier to see how it may be difficult for such employees to manage their independent learning, or exercise appropriate self-direction or self-regulation (Lim, 2005) in learning. Providing facilitator intervention, or even a new learning management system to encourage and support learner's self-regulation systematically, are steps that could mitigate the problems. This issue in terms of supporting learner's self-direction or self-regulation should be studied and examined in further research.

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Online Distance Teaching of Undergraduate Finance: A Case for Musashi University and Konan University, Japan

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Abstract

We implemented a synchronous distance course entitled: Introductory Finance designed for undergraduate students. This course was held between two Japanese universities. Stable Internet connections allowing minimum delay and minimum interruptions of the audio-video streaming signals were used. Students were equipped with their own PCs with pre-loaded learning materials and *Microsoft Excel* exercises. These accompanying course and exercise materials helped students comprehend the mathematical equations and statistical numerical exercises that are indispensable to learning *Introductory Finance* effectively. The general tendency for students, not to raise questions during the class hours in Japan, however, was found to be a big obstacle. As such, motivational devices are needed and should ideally be combined to promote interaction between the e-classrooms.

Keywords: Distance learning; online teaching; wide range LAN; e-Japan; *Microsoft Excel* exercises

Introduction

This paper describes the authors' experiences in designing and teaching an online, synchronous distance education undergraduate course, *Introductory Finance*. Two universities, Musashi University in Tokyo and Konan University in Kobe, located 400 miles apart, were involved in this project and the foci of this descriptive case study. Prior to embarking on this joint-project, both universities signed formal agreements to share resources for the development of this undergraduate finance course. Course developers involved in this project also visited the other campus frequently to familiarize themselves with both universities' institutional and student cultures, systems, and protocols. As such, all involved in developing this synchronous e-course were fully aware of each other's unique differences in terms of curriculum, student needs, and institutional cultures at both universities BEFORE the project was built. We believe this 'period

of acquaintance' helped enormously in developing this new online, synchronous distance education course.

How this paper is arranged

First, we overview the current e-Learning environment in Japan and define the mission of our project within the context of this environment. We then report our experience in developing and teaching *Introductory Finance* at two privately funded Japanese universities using an online, synchronous teaching environment comprised of streaming video relayed between the 'main classroom' at Musashi University in Tokyo and the 'remote classroom' at Konan University in Kobe. Specifically, we focus on the system and instructional design used, and describe our preparations for teaching online and project implementation. Described are the physical classroom environments and instructional devices employed, followed by a descriptive assessment of the project including problems encountered. We then suggest some possibilities for future improvement, from which students and academics may draw conclusions for further research.

e-Learning Environments in Japan and Our Project's Mission

Although Japan is one of the most advanced users and developers of IT hardware and technology in the world, and such technologies are employed in all sectors of the Japanese economy, including the academic sector, Japan's use of the Web-based technologies lags behind that of many other nations. For example, according to one recent report, Japan ranked 24th in the world and seventh in the Asia-Pacific region in its use of the Internet (The Economist Intelligent Unit & IBM, 2003). It can thus be inferred from this report that e-Learning is not well developed in Japan. Moreover, some suggest that Japanese people, in general, are culturally averse to distance-learning (Yoshida, 2004). We will discuss these later points within the context of our experiences in more detail later in this paper.

To redress problems of Web-based IT diffusion in both its industrial and educational sectors, in January 2001 the Japanese government established the 'Strategic Headquarters for the Promotion of an Advanced Information and Telecommunications Network Society' – a.k.a., IT Strategic Headquarters – and a project called “e-Japan”. Included in the IT Strategic Headquarters' and e-Japan's formally stated objectives are the development of Web-based IT education, e-Learning, and the development of human resources necessary to support and sustain such endeavors. Their target date for introducing Web-based IT education was 2005 (IT Strategic Headquarters, 2001).

Prior to implementing its e-Japan project, the Japanese Ministry of Education, Culture, Sports, Science and Technology (MEXT) had approved Master's programs using distance education in 1998 (Wong & Yoshida, 2001). Three years later, blended undergraduate programs were made available using a 'blend' of both distance and traditional modes, allowing undergraduates to earn up to 60 'distance' credits towards their minimum 124 credit Bachelor's degree (Jung & Suzuki, 2006).

In light of the general trends in e-Learning in Japan described above, we rationalized and developed our project along these lines.

- We followed the initiatives as set forth by the Japanese Cabinet in its “e-Japan” project.

- We strategically aligned the projects' objectives with those of the Japanese University Association for Computer Education (JUICE) and MEXT, two organizations that have been proactively promoting Japan's Web-based IT strategy at the university level for several years.
- We followed the natural progression of this trend. Indeed, because both universities were members of the “five-university league” (Gakushuin University, Seikei University, Seijo University, Konan University, and Musashi University), developing a joint distance learning project between two of these universities (Musashi and Konan) can be viewed as a logical step.

In defining the mission of our e-Learning project, we sought to address the mandates of e-Japan, JUICE, and MEXT. In spite of this, it must be made clear that we embarked upon this e-Learning project facing considerable cultural constraints, specifically biases against distance education in general. Indeed, some have argued that Japanese people value face-to-face education over that of distance education, and thus learning distance as a whole is viewed as inferior (Yoshida, 2004; Jung & Suzuki, 2006). Indeed, either by personal choice or simply by adhering to long established cultural norms, Japanese students typically avoid asking questions during lectures for fear of drawing attention to themselves. In Japanese culture – notably in classroom settings where teachers are venerated and expected to take command – students prefer to look and act 'anonymously.'

Wong and Yoshida (2001) report on previous implementations of e-Learning and distance learning at two Japanese universities. Wong and Yoshida's research, however, focuses on part-time students. Some argue that part-time working adult students are a unique subset of the larger student population, a sub-set that is highly motivated to learn as compared to younger, full-time students (Kawachi, 2005a). Accordingly, we submit that any findings drawn from our case study cannot be generalized to all Japanese undergraduate students.

Jung and Suzuki (2006) discuss how conventional face-to-face at a Japanese Liberal Arts College was 'blended' with online learning components to arrive at better learning outcomes, including enhanced classroom interactions, efficient classroom management, and effective information sharing between and among students and instructors. As of 2007, the International Christian University uses *Blackboard*, *WebCT* and *Moodle* to promote blended learning in its undergraduate and graduate courses (ICU, *n.d.*). It is conjectured, however, that because The International Christian University is a bilingual university (Japanese and English) its students and instructors are bilingual, and thus much more likely to have been exposed to e-Learning through its use of Western-made e-Learning management system and e-teaching materials. As such, it is suggested that while these reports are very valuable and provide great insights, the International Christian University's experiences in e-Learning are likely not typical of e-Learning in Japanese universities in general, wherein most topics are taught exclusively in Japanese to unilingual Japanese students who have had limited or no exposure to e-Learning. As such, it is suggested our experiences as described in this paper will add to the broader body of literature examining Japanese-only undergraduate e-Learning and distance learning.

Scope and Subjects

The focus of this study is an undergraduate course distributed between two conventional private undergraduate universities in Japan, located 400 miles apart.

The subjects of this case study were full-time native Japanese university-level undergraduate students. The students' are lectured in their mother tongue – Japanese – and the teaching and learning materials used are written and administered in Japanese. While some Japanese universities have engaged in online distance learning initiatives before, such activities were developed within the context of one university and typically delivered between that university's main campus and its' satellite campuses (e.g., Chuo University and Keio University). The case study reported here, however, is unique in that two completely different universities collaborated in the design and delivery of one online synchronous *Introductory Finance* course to undergraduate students.

Both classrooms – the main and remote classrooms – were equipped with personal computers (PCs). The computer to student ratio was 1:1, allowing students increased command over their online learning environment. The PCs were configured to allow students to participate in the synchronous, online classes with the other classmates located at the other university.

The authors' academic backgrounds are in economics and finance – not education or pedagogy. Although the authors are not instructional designers, both were involved in the design of the program. Both taught the online synchronous program. Similarly, the teaching assistants used in this project also had backgrounds in economics and finance.

Project Analysis, Design, and Development

Both universities began discussing this distance-education project in May 2001. As mentioned previously, the project was guided by the objectives outlined in e-Japan and were fully supported by both universities. Moreover, as academics with finance and economic as our scholarly background, we were unfamiliar with course design strategies. As such, from the beginning we attempted to inform our project with established instructional design principles and e-Learning assessments (Shimizu, 2005). Shimizu (2005), for instance, suggests that instructional design for e-Learning and distance learning use: 1) analysis, 2) design, 3) development, 4) implementation, and 5) evaluation. Kawachi (2005a) also emphasizes the importance of using multimedia for learning. Koontz, Li and Compora (2006) further cite the need to follow a concrete model for realizing effective distance education outcomes; they also voice concern that “programs and course are being implemented without following an established system design process” (Koontz, et al., 2006, p. 39). Our synchronous, online distance teaching pilot project, therefore, attempted to address the problems of e-Learning as described by Shimizu (2005), Kawachi (2005a) and Koontz and colleagues (2006). As such, we developed the *Introductory Finance* online e-Learning course in close cooperation with faculty and computing staff at both universities. We similarly allowed adequate time to deal with anticipated and unanticipated problems.

We designed our online synchronous distance-teaching environment with a 1:1 student-to-computer ratio. Each PC was configured so students could participate in their classroom three ways: 1) a live video feed from the main classroom at Musashi University; 2) a view of the instructors' computer screen located in the central classroom; and 3) a live video feed from the remote classroom at Konan University. The combinations of video streams – from large to small streaming video shots – depended on where an individual student's classroom was located (i.e., main classroom or remote). Online *Microsoft Excel* exercises were also administered synchronously online, a factor we opine enhanced students' comprehension of the learning objectives of the course.

Because students' learning styles vary considerably, students' learning process and their comprehension level must be evaluated in a flexible manner. As such, we structured student assessments following eight core elements (Koontz, et al., 2006): 1) environment, 2) emotional, 3) structure, 4) sociological, 5) physical, 6) instructional, 7) response, and 8) cognitive strategies used.

To predict our project's outcomes prior to implementation, we decided to refine our project's predicted outcomes by breaking our learning situation into two high-level dimensions: 'favorable' versus 'unfavorable' (Shimizu, 2005).

To predict our projects 'favorable' dimensions, we needed to determine our course's inherent strengths. We determined that the 1:1 student-to-PC ratio and students' online real-time, hands-on use of *Microsoft Excel* would greatly assist in their comprehension of the subject matter being taught, and thus would be on the 'favorable' side of the two dimensions. In terms of Koontz's eight elements, we determined these favorable dimensions aligned to Koontz's element 1 (environment), element 3 (structure), element 5 (physical), and element 6 (instructional).

To predict our projects 'unfavorable' dimensions, we needed to determine our course's inherent weaknesses. For the 'unfavorable' dimensions, we knew in advance that the students were from two different universities and would come to the course prepared with different sets of course prerequisites. Moreover, the students would be historically mired a culture wherein they would be more apt to defer to their instructor and seek to remain 'anonymous' and not draw attention to themselves. These 'unfavorable' dimensions align with Koontz's element 1 (environment) and more pointedly to element 4 (sociological).

Accordingly, element 4 (sociological) was deemed from the outset to be our greatest inherent weakness. Because these students would be new to distance learning environments, they would more likely be subjected to experience intense feelings of distress and unease, which in turn links downward to Koontz's element 2 (emotional) and 7 (response). Put simply, we knew in advance that the students enrolled in this project would need lot of courage to ask questions and a lot of encouragement to get them to talk and participate. In other words, we were asking students to remove themselves from their timeworn 'emotional' safety net of anonymity and place themselves squarely in center stage.

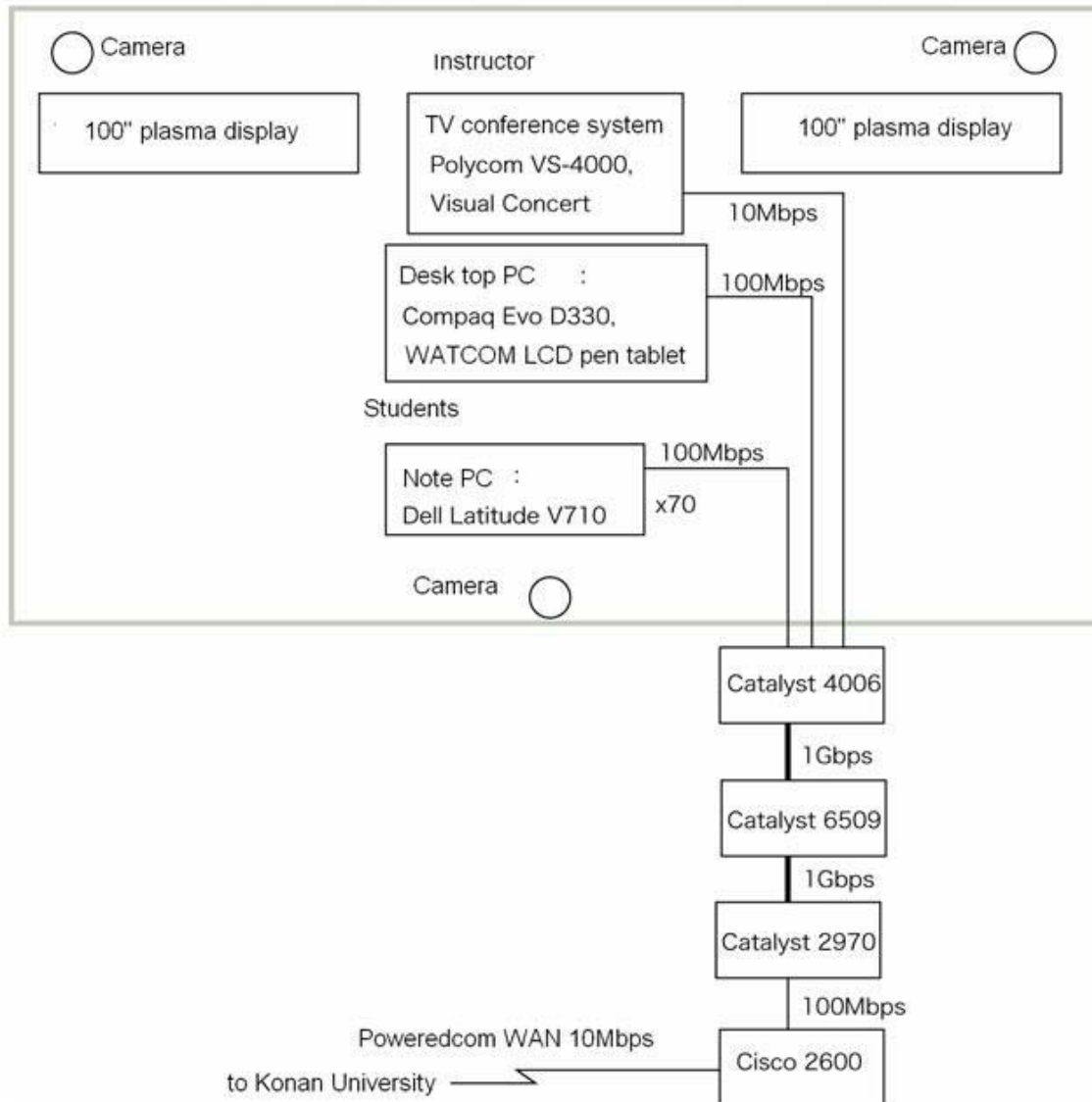
Project Case Study

Project preparation, system configurations, and implementation

In 2000, the Deans of the Faculty of Economics at Musashi University and Konan University met in Kobe Japan to discuss the joint e-Learning project in detail. At that time, MEXT had started to accredit distance learning environments. To receive accreditation, however, certain conditions and criteria had to be met. One criterion, for instance, was that before distance programs could be officially accredited by MEXT, they had to be staffed with qualified teaching personnel. Another criterion was that the distance e-Learning environment also had to be robust enough to support synchronous, real-time interaction between students and their teachers. Put simply, asynchronous distance course delivery would not meet the criteria needed to receive official accreditation. This was a significant technological constraint.

Indeed, faced with the demands of this criterion, it was determined by the computing staff at both universities that the Internet infrastructure in Japan was not yet very robust. Faced with this technological constraint, it was determined that our first priority was to maintain stable Internet connections. As such, we chose to use a 10 Mbps wide area LAN to connect directly between the two universities. We also chose the same Polycom 4000 cameras to minimize the stress of coordinating between these two equipments (See Figure 1).

Figure 1. System Chart of Musashi University's 8501 classroom



Because both universities were well aware of each other's educational needs and constraints, it was decided that the 'shared course' could not be too difficult. Musashi University, which offers a wide range of Finance courses, suggested that a course in *Introductory Finance* would be best. Konan University, on the other hand, felt that an Asian (Chinese) economy course would be more appropriate (Konan University is renown for International Economics). Ultimately, after much

discussion and testing, *Introductory Finance* was chosen as a course to be taught from Musashi University.

2001 was spent testing streaming signals using hypothetical e-Learning environments. The three vendors, Sony, Panasonic, and Hitachi, provided much needed equipment to conduct these experiments. We were extremely thankful to have such cooperation from these private-sector firms, because the cost of this equipment to support e-Learning was extremely expensive at the time. When the various hypothetical experiments were found to be successful, both universities agreed to exchange online courses and the presidents of the two universities signed a formal agreement to exchange classes using synchronous e-Learning delivered at a distance.

The faculty and staff involved were very excited and wanted to get started straight away; however, as a strictly precautionary measure, we continued with our hypothetical experiments for one more term. Such precaution proved to be prudent, as we soon discovered the streaming audio signals tended to become distorted and, at times, the streaming audio-visual signal dropped altogether. The vendors and the computing staff from both universities worked collaboratively to determine and address the root cause of various technological problems as they became apparent. For instance, at Konan University some of the routers needed to be updated to allow the sending of streaming audio-video signals. Indeed, we discovered that whenever these signals were dropped and lost, the digital packets of information were also lost. At Musashi University, it was determined that the routing of the LAN needed to be changed as well. Once these technological problems were resolved, we were then ready to start the actual design of the course, *Introductory Finance*. By autumn 2002, our distance e-Learning teaching was officially accredited.

Classroom environment and instructional devices used

We used a dedicated wide area LAN supported by the 'Internet Initiative Japan' to connect the e-Learning classroom at Musashi University to the e-Learning classroom at Konan University. The classrooms at both locations were equipped with PCs resulting in a 1:1 computer-to-student ratio. One large sized projection screen was located at the front of each classroom and configured to stream three videos of classroom interaction: two images were broadcast via Polycom cameras situated at both universities e-Learning suites, and an image of the instructor's PC screen (see Figure 1). Three controllable Polycom 4000 cameras were strategically situated in the Musashi classroom and two Polycom 4000 (one stationary and one portable) cameras were situated at Konan University. Teaching assistants at both universities were trained to operate the Polycom 4000 cameras and taught to anticipate students' participation in the e-classrooms. For instance, during the final exam, the teaching assistant at Konan University panned the camera across that university's e-classroom to allow the instructor at Musashi University to monitor the exam.

The lecture component of this course, delivered and facilitated by two economics professors, was broadcast from Musashi University. Konan University provided the professors.

Because 'first time' students were more likely to be hesitant to ask questions due to cultural norms requiring them to remain 'anonymous,' coupled with the pressure of learning how to learn in an e-Learning environment, full professors were used to teach the class. Indeed, it was felt that the students were more likely to respect and respond to professors' words of encouragement over that of teaching personnel with lower academic qualifications.

Numerical examples and exercises are indispensable. As such, all students were equipped with their own PC. The first instructor taught the concept of the present value and optimal portfolio

formation based on 'beta' coefficients (Kubota, 2001). *Microsoft Excel* was used to teach 'present values,' while 'optimal portfolio formation' was taught using *Excel*'s 'Solver' and 'OLS regression' tools. Students were also taught 'futures and option pricing theory' (Black & Scholes, 1973) using the numerical generator for normal distributed variables in *Excel*. As such, students used *Microsoft Excel* to meet the learning outcomes of *Introductory Finance*.

The e-classrooms met once a week for 90 minutes, which is typical of most higher education courses in Japan. Students told us that watching the continuous 90 minute lecture broadcast resulted in eyestrain and boredom, more so for the 'receiving' party at the remote classroom at Konan University. To remediate this problem, we sought to combine both the lecture session and the *Excel* exercise session within the 90 minute sessions. We found that this tactic of combining the lecture with the hands-on use of *Excel* encouraged students to raise questions, particularly from the remote classroom at Konan University. Still, we regretfully must report that students enrolled in this e-Learning course did not ask questions as much as we had hoped. To address this problem, we found that questions must be raised straight away at the beginning of the course, questions that encourage interaction between the two classrooms, with particular focus paid more on the remote classroom to encourage their participation. Such interaction was also discovered to be very necessary, as it alerted instructors to detect and correct technological issues such as distortions in volume.

It must be stressed, however, that technology did not form the basis of interaction between instructors at the two different universities. To get the classrooms flowing, sometimes the two instructors engaged in heated debate and encouraged students to get involved in the discussion, if only to motivate the students in both e-classrooms. Now that we have been teaching this course for three years, and have reached a level of comfort, it was decided that instructors were not needed at the remote e-classroom. Indeed, the instructor in the host classroom had acquired enough expertise to keep both classrooms active.

Interpretations and evaluation

Musashi University has been continuously administering and collecting teacher evaluation questionnaires from students enrolled in the Introduction to Finance e-class. While we are not at liberty to disclose the 'actual' content of these surveys, the broad data collected indicate that students enrolled in this e-course were generally satisfied, findings that are comparable to or better than other traditional courses in terms of use of course syllabus, use of projectors, voice clarity, and the use of learning aiding materials such as the PC exercises. Moreover, because a sizable portion of course e-contents prepared learning objects such as *PowerPoint* presentations, Mathematical files, *Excel* exercises, these learning objects were also highly assessed by the students.

Students also reported having experienced significant psychological stress. However, we feel that this finding is likely deceptive. Indeed, the e-classroom students could be more stressed by mathematical exercises than the e-Learning aspects of their course. Still, when the students were questioned if they would recommend this e-course to a friend, many reported that they would not recommend taking it, a score that is below that reported in similar courses taught in traditional classroom settings. So, while it is difficult to ascertain whether this difficulty arose in 'course content' or 'distance e-Learning' per se, we still believe the 'course contents' were the more likely explanation for students reluctance to recommend this e-course. We say this because economic students in Japan are typically not well equipped to handle the mathematical or statistical exercises they need to do well on this course, as they are not exposed to these concepts until they

reach post secondary education. So, while further research is clearly needed (i.e., whether students exposure to statistics is best taught synchronously online versus in traditional face-to-face settings), we strongly suspect latter is the case – because most students are grappling with these mathematical concepts for the very first time, they are more apt to experience and therefore report 'stress.'

Nonetheless, previous research by Jung and Suzuki (2006) shows that students tend to discourage others from taking synchronous online courses and instead placing emphasis on traditional courses offered face-to-face as the more preferable option. Indeed, sociological traits – specifically element 4 in Koontz's eight core elements (Koontz et. al., 2006) – students are not to ask questions and instead show respect to instructors, which is typical for many Asian countries. In Japan, in particular, most students are reluctant to ask questions and tend to gather and ask questions among each other after the class ends (Koontz, 2006).

The technology used to support the e-classroom could also inadvertently chill interaction and students' learning experience. Use of multiple cameras distributed between two classrooms and the use of microphones and PC-based technologies could very well intimidate many students. This fact, therefore, can be classified as deterrence to learning – element 7, response, according to the definition offered by Koontz and colleagues (2006).

Japanese students' reluctance to ask questions, while not surprising, still made our distance learning endeavor very difficult, indeed. We opine that this aspect alone is likely the most difficult aspect teaching courses online synchronously. In particular, we feel that undergraduate students have yet to learn how to question the validity of 'facts,' theories or opinions, and are thus more apt to benefit less from synchronous e-Learning classes taught at the undergraduate level. In sum, we have serious reservations about success of undergraduate level online synchronous courses in general, an opinion that is supported by others. For instance, Jung and Suzuki (2006) have suggested that blended learning is one viable solution that can improve this dilemma. We further opine that this may, in fact, be the most significant reason why distance online learning is not yet well received in Japanese society – over that of costs involved in building the infrastructure needed to support synchronous e-Learning as envisioned by the Japanese government.

In spite of these aforementioned concerns, we feel that sound instructional design principles must be used (Shimizu, 2005). For example, through trial and error, we found that if students were asked to present their solutions on various exercises to their fellow students at the other location, this alone greatly enhanced discussion and interaction between the two groups. Such interaction must be designed purposely and integrated into the course materials using established instructional design principles.

In conclusion, we feel that it is important to design e-courses in such a manner as to force students to speak up and compel them to communicate with each other. Indeed, conversational teaching models, like those used in MBA courses, (Jung & Suzuki, 2006) provide the much needed 'intellectual fodder' to fuel debate and interaction among students and teachers.

Still, we feel that because all undergraduate students must first learn the fundamentals of their discipline – fundamentals that tend to be imparted via more traditional 'teacher centric' models – the use of 'conversational models' may not be fully appropriate for undergraduate e-courses delivered synchronously online. Indeed, unlike graduate students, undergraduate students typically have less time to devote to 'questioning' activities required to encourage responses

(Koontz et al., 2006), simply because they are still absorbing the fundamentals. So, while sound design principle must clearly be used in all online synchronous courses, 'conversational models' may not be appropriate in introductory courses. Still, these very principles should be particularly helpful to help Japanese students overcome their cultural reluctance to draw attention to themselves by asking questions.

Future Improvements

Over time, we realized that students' hands-on use of *Microsoft Excel* helps them comprehend and master the online learning materials. Moreover, exercises in *Microsoft Excel* help to break up the e-class into manageable bits, breaking monotony of lectures and reducing eyestrain. Extra time spent for these online exercises during e-class hours is especially important for Japanese students, because they often do not have time to do review exercises unlike in the U.S. schools.

We also came to realize that using *Microsoft PowerPoint* for presentations often resulted in our teaching the class far too fast for our students to comprehend, probably because they remained passive instead of engaged learners. We also found that the online *Introduction to Finance* classes should be divided into different activities to include time for instruction, student exercises and presentations, and discussion. It is also important to determine the pacing and timing of classroom activities and ways to encourage students to participate. Finally, we found that free-flow discussions between and amongst students at the two locations made learning *Introductory Finance* a more fruitful learning experience.

Through two years of our experience in teaching the online Introductory Finance for undergraduate students, we have accumulated good assessments of the potential and the problems inherent in real time distance learning for the undergraduate students in Japan. It was a challenging task, but it was worthwhile trying. The mastery of the beginning level of Mathematics and Statistics is strongly called for learning of the Introductory Finance generally, and we expect that the use of the *Microsoft Excel* exercises in an exciting atmosphere of the real time distance e-Learning stands on its own foot at the frontier of the undergraduate education.

Limitations and Conclusion

The authors of this report are specialized in Economics and Finance. None had a formal academic background in Education or Pedagogy. Thus, a complete and thorough assessment of the effectiveness of this online teaching project was beyond our capacity. However, we did strive to analyze our 'practice' as based on the literature on instructional design principles. We have also highlighted unique characteristics facing e-Learning activities in Japanese higher education today. We therefore feel that the descriptive evidence reported here may benefit those seeking to do further research along this line of inquiry.

In conclusion, our experiment revealed several benefits and pitfalls of teaching synchronously at a distance, using e-Learning technologies. More importantly, we discovered and overcame numerous technological obstacles. As such, we found that technology itself was not basis of our most pressing concerns. Instead, we discovered that incorporating hands-on exercises (i.e., *Microsoft Excel*) into the online lectures provided an effective diversion for the student to remain engaged. We also found that efforts to maintain effective interaction between the two classrooms and asking students to prepare themselves by reading the course materials beforehand were the

two factors that led to their success in this online course offered at the undergraduate level in Japan.

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Integration of the High-tech and Low-tech in Distance Teacher Training in China: An insight from the Case of Jiangsu Radio and Television University

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Abstract

This paper reports the results of a pilot in-service teacher training program undertaken in China from 2001 to 2004. Upon completion, the in-service teachers were awarded a Bachelor of Arts degree (non-honor) specializing in English Language Education. Many interesting findings resulted from this pilot program. By integrating low- and high-technology in the distance in-service teacher training programs, both the trainers (the university lecturers) and the student teachers (in-service school teachers) were able to transform their pedagogical skills. The student teachers learned to become independent learners. The university lecturers learned to adjust their teaching styles to be more learner-centred. Both the lecturers and the student teachers adopted task-based approaches to learning and teaching. Finally, the student teachers were given the means to upgrade their qualifications and teaching skills. Based on these findings, the authors offer suggestions for the future development of student teacher training in China using distance modalities.

Keywords: high-tech and low-tech; distance education; student teacher training; pilot program

Introduction

In recent years, distance education received more attention than ever before in China. In particular, the application of hi-technology into language education has been widely discussed and proactively adopted among universities. Following this trend, China's educational authorities and administrators are now aware of the need to inject distance teacher training program with new pedagogical materials, methodologies, and technologies. These distance programs are needed for in-service school teachers to upgrade their knowledge, earn qualifications, and improve their approaches to teaching (Wei, 1999; Yu, 1999; Zhang, Niu, & Jiang, 2002).

In 2001, China's Central Radio and Television University (CRTVU) initiated a nationwide open and distance teacher training program, which was accredited by China's Ministry of Education. Owing to its large network and readily accessible educational system, CRTVU's distance teacher

training program was well positioned to serve school teachers across a much wider geographical area.

Jiangsu Radio and Television University (JRTVU) is a distance education institution located in Jiangsu Province in China. From 2001 – 2004, JRTVU was involved in a pilot three-year BA degree (non-honor) program designed to upgrade the skills and qualifications of in-service school teachers who teach English, by providing them with new pedagogical materials, methodologies, and technologies at a distance. This paper reports on the open entry pilot BA program (2001-2004), which integrated hi-tech and low-technologies in open and distance learning and teaching.

Bates (1995) cites four main reasons for employing distance education (DE) in teaching:

1. DE helps widening access to formal and non-formal learning opportunities
2. DE is cost-effective
3. DE flexibility is excellent in helping re-orient teachers in times of educational change
4. DE can help expand the supply of qualified teachers

According to a national survey conducted in 1997, only 51 percent of China's senior middle school teachers had a four-year college education, a number far from the 70 percent target stipulated by China's Central Government for the year 2000 (State Council 1994). Consequently, CRTVU was directed by China's Ministry of Education to commence distance teacher training to upgrade China's school teachers using an open door policy, meaning this program was open to all in-service teachers.

As of 1999, in Jiangsu Province, 80.56 percent of senior middle school teachers had a Bachelor's degree, a number that clearly exceeds the minimum national requirements. However, in terms of junior middle school teachers, only 13.39 percent held a Bachelor's degree (Jiangsu Educational Council, 2000), a number that falls far short of the minimum national requirement of 70 percent. As such, Jiangsu's educational authorities are aiming high for all secondary school levels. This is good news not only for China, but for the teachers as well, as there existed, in general, a strong desire among school teachers to upgrade their qualifications.

Owing to its established network in Jiangsu Province, a network that consists of affiliated teaching and learning centers, the Jiangsu Radio and Television University, was also well situated to take part in this program. As such, JSRTVU has played a key role in the pilot BA teacher training program, delivered at a distance.

Aims of the Program

This program aimed to upgrade China's junior and senior school teachers' qualification, develop their pedagogic and linguistic competencies, teaching methods and strategies, learning strategies, as well as their language knowledge and ability (listening, speaking, reading and writing in English).

Student teachers enrolled in this DE program are granted a BA degree upon satisfactory completion of the eight-year program. Their academic credentials have been validated by the China's State Ministry of Education, and awarded through the CRTVU. The program is a credit-based program, comprising of 11 compulsory courses, including three orientation courses. To earn their BA, these student teachers are expected to:

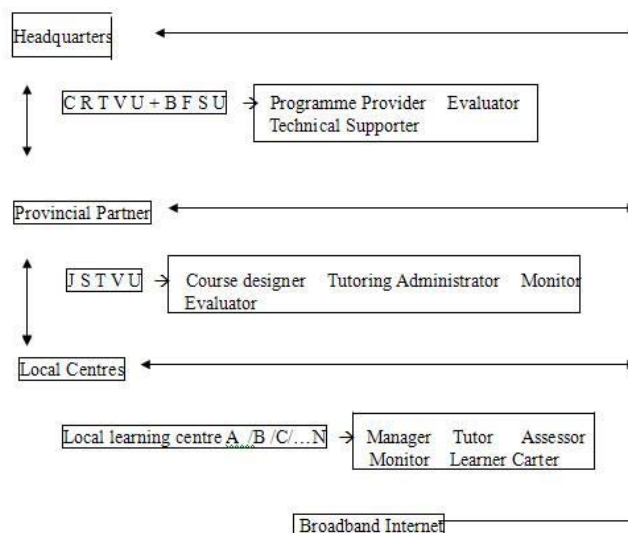
- Build upon their basic knowledge of the English language
- Acquire the motivation and skills for lifelong learning
- Gain a better understanding of current developments in Education of language education
- Become equipped with new teaching materials, methods, and course designs
- Develop their capability for designing syllabi
- Carry out action research in their classrooms
- Use and incorporate modern educational technologies to their teaching

The Organizational Structure

CRTVU acted as the headquarters for the distance training education. For this program, CRTVU cooperated with the British Council. Beijing Foreign Studies University (BFSU) was the primary program provider and evaluator. JSTVU, on the other hand, was a provincial partner of CRTVU, and involved in course design, tutoring, administration, course monitoring, and assessment. JSTVU is comprised of 14 local learning centers located in cities and municipalities scattered throughout Jiangsu Province. Each local learning centre employs a manager, tutors, assessors, monitors, and learner caretakers. In sum, the learning centers' job is to relay the courses and instructions to student teachers, who are often working in small towns and in outlying rural areas.

CRTVU, BFSU, and JSTVU use the Internet as its primary means of communication. ATM networks have been established with the LANs-based learning centers throughout the Province. The organization structure of this partnership is outlined in Figure 1.

Figure 1. The organizational structure of the three partner institutions



Course modules

The pilot BA program was designed, developed, and produced by a course team jointly drawn from the BFSU, the British Council, and CRTVU. The program is comprised of two modules. The first is called *English Language Communication* and is comprised of eight courses (144 hours study for each course). The first module aims to improve the in-service teachers' proficiency in English. The second module, called *Professional Training*, is comprised of three courses (288 hours for each course). The purpose of the second module is to provide the student teachers hands-on professional development, as well as much needed time (three months) to practice and become proficient with the English language teaching methodologies learned.

The multi-media course materials were thematically structured and task-based, and comprised of print-based course textbooks, audio cassettes, and videos.

High-tech and Low-tech Integration in Course delivery

Reiser and Gagne (1983) advise that the selection of the teaching and learning media should be executed in line with the learning context. Wiclit (1997) summarizes five factors that must be taken into consideration when using technology for course delivery.

1. Availability of adequately developed technology
2. Accessibility of media for both the teaching institution and the learners
3. Acceptability to both teachers and students
4. Validity or appropriateness of the media in achieving the objectives of the learning materials
5. Cost-effectiveness

The application of high technology was the priority of the pilot BA program. Thus, designers of the program sought from the outset to integrate hi-technology (computer-based) and low-technology (traditional) as its instructional technologies.

Assessment and Evaluation

Formative and summative assessing activities were adopted to evaluate the student teachers' progress through the program. The formative assessment accounted for 20 percent, while the summative assessment accounted for 80 percent of the total for the assessment. If the student teachers had no formative assessment on record, or if they had failed it, these student teachers automatically lost the right to sit the end-of-term examination. The student teachers, therefore, could only obtain credit when they passed the two forms of assessments (minimum pass of 60 percent).

Implementation of the Program in JRTVU and Local Centers

The trainers (university lecturers)

The cohort of university lecturers – herein called tutors or trainers for convenience sake – consisted of part-time instructors drawn from conventional universities located within the vicinity of each JRTVU learning centre (six local centers at first, and 14 local centers at the end) and full time instructors drawn from JRTVU. Most university instructors also worked as tutors at the local learning centers, while a handful worked as consultants to the JRTVU managerial team.

In this pilot program, the tutors' task was to proactively support and track the student teachers' learning process and progress. As such, the tutors' role involved acting as a:

- Needs analyst
- Motivator
- Resource provider
- Organizer and controller of the in-service teachers' behavior in tutorials
- Demonstrator of the language teaching
- Monitor of in-service teachers learning
- Assessor of the in-service teachers' performance
- Counselor and friend to in-service teachers

Student teachers

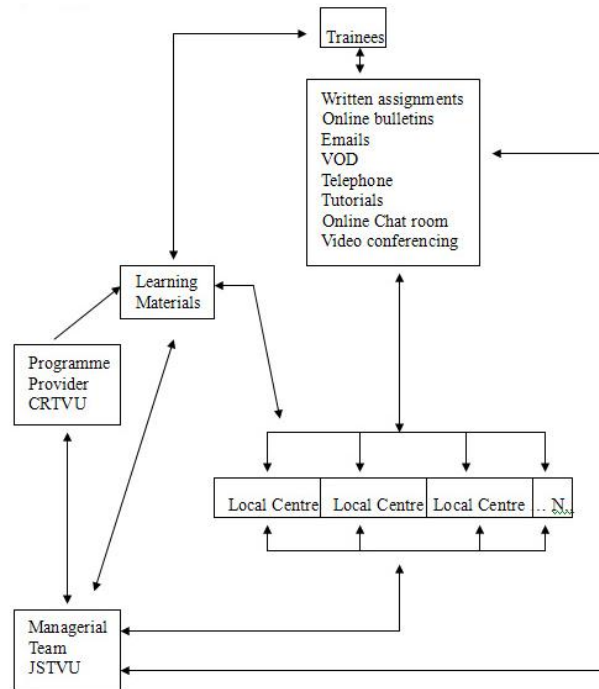
Two-hundred, twenty ($n = 220$) student teachers enrolled in JRTVU during the first year the program was offered. A similar number of student teachers joined in the second year, reaching the total number of 992 program student enrollees by 2004.

The student teachers came from different (mostly rural) areas of Jiangsu Province. Most had taught English for at least three years to 10 years; only a few reported having taught 20 years or more. The age of the student teachers ranged from 21 to 50 years old. Most were female and most shared the following characteristics:

- Most were middle aged
- Lacked of confidence in their prior education
- Shouldered heavy work loads at home and at their schools
- Displayed poor competencies in using English and technology
- Experienced frustration and panic learning at a distance
- Embraced spoon-fed traditional teaching and learning strategies

- Showed strong motivation for upgraded qualification

Figure 2. Model of implementation of integratration with High-technology and Low-technology (



Adapted from (Tong, Wei and Xu, 1999)

All course curricula were posted to specifically designed Website and an online platform housed at JRTVU. This online platform was designed to:

- Provide student teachers a means to familiarize themselves with the course via its syllabus, desired learning outcomes, etc.
- Deliver news and notices
- Deliver teaching/ tutoring components of the course online
- Provide a forum for online discussions
- Allow the student teachers a means to upload their assignments, perform online tests, etc.
- Track the student teachers' activities and their overall learning processes

While the student teachers:

- Submitted their assignments and received feedback from the tutors
- Browsed the online course materials and performed Web-based searches

- Participated in the online discussions and tutorials
- Completed online tests and assessments

Tutorials

Implementing a skill-based program within an open and distance learning (ODL) environment, particularly in terms of pedagogical skills development in the form of writing and speaking, was a great challenge for the JRTVU managerial team and the pool of tutors. In the field of language teaching, there has been a move away from passive approaches to language learning (i.e., the grammar-translation approach) towards a more active and participatory approach (i.e., communicative, oral language teaching).

To compensate for the lack of ‘oral communication’ inherent within older distance learning settings, synchronous online and face-to-face tutorials were designed and delivered to the student teachers. This approach to teacher training in rural areas, however, is unlike those practiced in other developing countries such as Brazil (Bof, 2002), Botswana (Bose, 2003), and Rwanda, (Mukamasoni, 2006), authors who have reported using a blend of face-to-face tutorials in support of its distance education offerings, typically held during teachers’ summer vacations.

Monitoring and Quality Assurance

Online learning activities, oral and written assignments, face-to-face tutorials held at the local centers, and final assessments were used to track, monitor, and evaluate the student teachers’ performance and progress through the course. The course was ‘paced’ using pre-set deadlines for written assignments deliverable online or via post. This meant that the student teachers had to learn how to use their effectively and efficiently. As such, these monitoring activities helped the student teachers to arrange their schedules, pace their efforts, and use their limited time accordingly.

To ensure that the student teachers were receiving appropriate, high-quality feedback from their tutors, marked and graded student teacher assignments were randomly selected and assessed by an expert in English teaching. Not only did this ensure the quality of teaching, it helped JRTVU to assist and target tutors who themselves may need upgrading and training. Regular meetings each semester provide tutors with face-to-face feedback on their performance. On site school visits had been discussed, but were later abandoned due to funding.

Three questionnaires were designed, distributed, and analyzed. Questionnaire 1 focused on the needs of the student teachers, their educational background, their English learning and teaching information, as well as their expectations for the program. Questionnaire 2 aimed to track and assess the student teachers’ performance one year after the pilot program. Questionnaire 3 was an overall investigation of the student teachers, specifically their reflections on the three years’ with the program, and evaluation of the program. Focus groups and local visits were also arranged for both the student teachers and their tutors’, to allow reflection on their involvement with the program.

Results and Analysis of the Pilot Program

Qualitative and quantitative data collected and compiled on the 2001 cohort (this cohort had completed the full three year cycle) shows that the pilot program was considered to be quite successful. The drop out rate was very low, at less than 3 percent. This figure is much lower than

reported in other distance programs offered by conventional universities (Zhang, et al. 2002). The main explanation for this low dropout rate is, however, likely due to the student teachers motivation. Most student teachers indicated they would continue with their learning because if they failed to earn a Bachelor's degree, they would lose their teaching post.

Interesting findings have been unexpectedly observed as well. The integration of low-tech and high-tech appeared to work together in a complementary fashion. Tutors and student teachers alike reported that they had greatly advanced their language learning and teaching skills, primarily due to the integration of high-technology Web-base teaching modes with that of traditional low teach distance teaching methods.

Evaluation from the student teachers

In sum, the data collected indicates that the vast majority was satisfied with the pilot program. Here is the brief statistical summary of feedback gathered from student teachers:

Efficiency of learning by distance:

- 69.4% of the student teachers indicated that they spent at least one hour each day engaged in independent learning activities
- 83.9% reporting having followed the learning sequences as stipulated by the learning materials
- 71.8% reported that they had made substantial progress in their language and communication skills
- 70.6% of the student teachers indicated that it was feasible to learn at a distance, because they learned to manage their own learning
- 85.5% reported being satisfied with their progress
- 52% reported having become computer literate
- 77.3% reported that they felt that access to computers and the Internet had helped in their distance learning
- 77.4% reported that they had browsed the website every week
- 87.6 reported that they used the computers at their learning centers to log on the course website
- 74.4 reported that the course helped improve their classroom teaching

Appropriateness of learning materials and method of course delivery:

- 86.4% indicated that they felt the learning materials were appropriate for distance learning
- 94.1% felt the learning materials were relevant to their profession
- 74.3% thought the task-based course books helped them to upgrade their language

teaching skills and learning autonomy

- 96.9% indicated that high technology is more efficient when integrated with traditional DE technology
- 60.4% reported that the course website was easy to access and use
- 72.7% reported the information published on the course website as satisfactory
- 45.0% felt they could easily interact with their peers online

Quality of learner support:

- 72.3% of student teachers felt it was feasible to learn at a distance combined with face-to-face tutorials
- 45.2% reported that ‘learner support’ available to them was excellent; while 37.1% reported it to be satisfactory
- 86.4% reported that the tutors’ written feedback was helpful
- 77.9% felt that the face-to-face tutorials were demonstrative of tutors’ oral, communicative language teaching skills
- 98.9% felt the staff at the local learning centers were quite friendly
- 87.6% reported email as effective for communication
- 66.4% indicated that their tutors were easy to contact
- 73.7% reported that the course website provided them with timely feedback

Personal and professional achievements received:

- 30.6% reported having received a professional promotion
- 6.7% having received local ‘Teaching Excellence Awards’

After the questionnaires, informal interviews were conducted. The outstanding response reported was that the student teachers had ‘learned how to learn’ by themselves. They indicated that their overall performance in their middle schools – especially in oral language skills – had improved tremendously, and had positively influenced their colleagues and students. Most student teachers, however, worried whether they would feel out-of-place, like a “Crane among the Chickens” or whether they would revert to their timeworn, traditional teacher-centered, examination-oriented teaching and learning styles.

Evaluation from the tutors

Generally, the tutor feedback was also positive. Feedback was gathered using focus groups, and via personal and informal face-to-face interviews. Tutors from the conventional universities reported they were generally satisfied with the learning materials, approaches used in course implementation and the monitoring and assessment system (which, they reported, helped the

student teachers to better manage their time). On a down note, the tutors reported that preparations for the tutorials were very time consuming and very difficult. Course activities had to be designed and teaching materials collected before the face-to-face tutorials, typically at the last minute, to match the needs of the cohort. Because the students had read chapters before they entered the classroom, this left the tutors little need to lecture on topics covered in the text.

Some tutors also reported that they were reluctant to change and transform their teaching strategies. Just as the student teachers had to learn to become 'independent learners,' so too did the tutors have to learn to become more 'student-centered' by asking and posing questions, offering more authentic tasks, etc.

Problems Experienced

High-cost, low-efficiency for a provincial partner

Based on the data collected, the authors determined that the program is high cost/ low efficiency. This finding is based on the number of student teachers enrolled, tutors' workload, and need to equip the learning centers with computers and Internet connectivity. Indeed, each learning centre had to be equipped with computing centers to support the student teachers. Access to Internet-connected computers was also a requirement for enrolment. Theoretically, each student teacher should own their own computer, but this clearly was not the case. In fact, even in more developed Asian countries such as Korea, which enjoys high connectivity (Jung, 2001), ownership of personal computers among student teachers is relatively low. This fact alone contradicts the theory of cost-effectiveness of ODL in terms of increasing access at low cost. This finding also mirrors that found in conventional universities, as reported by Zhang and colleagues (2002).

Learner readiness

Teachers' beliefs and practice are typically hard to change. One reason is because teachers are conditioned by their prior learning experiences, typically learned in schools and higher educational institutions where face-to-face classroom teaching dominates. Using high technologies may pave the way to independent learning and autonomous learning; however, in practice, tutors indicated that they expend much more energy and put much more effort into tutoring online in 'learner centered' contexts – the pedagogic strategies needed in distance learning settings! Meanwhile, many of students enrolled in the pilot program reported that they have work colleagues studying at other higher educational institutions using traditional approaches of learning and teaching. As such, we felt 'brainwashing' to be a necessity, especially at the beginning phase of a distance-learning course of study. Continuous efforts have been made in helping the student teachers' gain more proficiency using ICT technologies (this is an optional course).

Quality vs. quantity

We found that open entry does not mean open to all those who are interested in the program. For instance, we have found some learning centers had accepted non-teachers into this program, which resulted in the students feeling frustrated and upset, because they were simply not prepared or academically equipped to participate effectively. The reason clearly lies in the 'quantity' requirement – so many students must be enrolled, which means quantity has watered-down the quality. This accidental finding gives rise to one possible solution: universities should consider offering a new pre-service teacher-training program or some other type of induction course for those who wish to seek teaching as a career option.

Forms of assessment

The assessment and evaluation adopted in the pilot program are still rather traditional, that is, paper-based and memory-based. The current practice in the final exam is not well suited for working adults or for online learning generally. Consequently, most student teachers had made special preparations for their final exam (rote memorization), which keeps them from becoming life-long learners and may hinder their later professional development in engaging in authentic learning. The educational authorities still adhere to this kind of assessment, however, although the experts from the British Council have suggested another route.

In summary, through the program implementation, the authors conclude that:

- These traditional school teachers (a.k.a., student teachers in this paper) have become independent learners as they progress through their studies
- The university teachers (tutors) have learned how to change their classroom teaching style to be more learner-centered and less teacher-centered
- The oral, communicative task-based approach was quite good, and unexpectedly adopted and incorporated into the student teachers' learning and teaching process
- The student teachers not only upgraded their qualifications, but they also upgraded their teaching methodologies use

Some Insights from the Pilot Program in Jiangsu

The distance teaching system used at the JRTVU used a blended learning and teaching system. By design, in responding to the needs of the student teachers, courses were delivered via using a blend high- and low-technology delivery and teaching methods. The courses have been found to be instrumental in challenging long held beliefs about where, when, and how teaching and learning should take place. What is critical is not where the learners are located, but whether they can interact with their tutors or the course materials. With the completion of the pilot program at JRTVU, the following characteristics can be reported:

The merging of the high- and low-technology delivery systems

In an ODL institution like JRTVU, the target group of students is typically heterogeneous in terms of age, experience, qualification, and learning styles. As such, the pilot program was designed for individualized learning, mapping of pathways to learning, and aimed to incorporate and facilitate different learning styles (Gagne, 1985, 1992). Two-way delivery systems were merged and used by one university, specifically offering a face-to-face mode of delivery complemented with multimedia technologies and distance modes of delivery using ICT on a real and a virtual campus. This blended mode of course delivery was found to be very interactive, accessible to all student teachers anywhere, anytime, 24/7. As a result, this program allowed for tremendous access previously not attainable.

Collaboration with conventional universities

China' Radio and Television University's (RTVUs) hold much lower academic rankings compared to long-established, conventional universities in terms of status, reputation, teaching, students, research, and facilities. RTVU's however, have the reach that traditional universities

cannot have. Collaboration with the conventional universities should therefore be a priority in providing quality distance education throughout China. JRTVU joined the pilot program partly because it was a joint program with BFSU, which has a good reputation in foreign language teaching. The role of accreditation cannot be over-emphasized and it must be backed-up by the reputation of the organization (Walandouw & Penrose, 1994). This is especially true in the Chinese cultural context. In practice, however, care must be taken to ensure that quality standards are not compromised and that certificate credibility is maintained.

Quality learning materials for distance learning

Compared with ODL systems in China, the print course books are specifically designed and prepared for distance learners by dividing learning materials into smaller portions for learners, especially those who cannot afford the luxury of taking off an afternoon from work to study, or even an evening to study at home. In-service teachers in particular, have heavy workloads, teaching 30 hours or more per week, in addition to looking after their families. And while online delivery of the learning materials is very tempting for cost and access conscious administrators, care must always be taken to ensure that the course demands will not negatively impact busy learners.

For example, suppose student teachers are sitting down at their desktop computer screens, reading the relevant course chapters page-by-page, for one hour or more without interruption? Or download and print them? Do they have access to a printer? If so, is the printing affordable? Portable, wireless laptop computers might be one solution. But this option currently does not exist in most parts of China.

Appropriate forms of tutorials

The Chinese culture of education is based on a tradition of teacher-centered, teacher authority oriented learning styles. Throwing teacher-dependant students (even though they are teachers themselves) into learner-centered ‘learning pools’ could make them feel like they are drowning, make them lose their sense of direction, frustrate them, and result in loss of confidence.

As such, the JRTVU’s practice, the forms of the tutorials, have been selected for specific learning purposes, modes, and contexts. Local learning centers are available to provide face-to-face tutorials, which serve the purpose of training students to ‘learn how to learn’ in their new ODL context. Whether you agree or not, “face-to-face interaction (where) it is the most appropriate technology” (Moore, 2006, p.132). Low- and high-technology-based tutorials have been used alone or together in support of student learning. The tradition of ‘cramming knowledge’ gives way to useful knowledge that enables learners to lead a self-directed, informed, and hopefully virtuous life. The contemporary DL programs’ approach used by JRTVU now leads student teachers, step-by-step, towards communicative language teaching skills for nearly three years. All tutorial demonstrations conform to the new requirement as articulated by the New National English Teaching Curriculum for Middle Schools (MOE, 2001), which advocates the communicative language teaching approaches.

Conclusion

In this report, we have dwelt on the background of a pilot student teacher training program. Explored was the design and implementation program through JRTVU and its local centers. The tutors and the student teachers all reported experiencing dramatic changes in their learning and teaching styles as a result.

Based on current practice at JRTVU, we discovered that technology does not teach – it only provides the tool that enables the delivery of teaching at a distance. This technology shifts the responsibility of learning away from that of the teacher towards that of the individual learner. Still, technology itself and of itself does not teach – only humans can teach and learn how to learn. The challenge for the educational community, therefore, will be to create viable pedagogies take into account – but are not driven by – the particular technology chosen for use (Freeman & Johnson, 1998).

Through its pilot teacher-training program at a distance, JSTVU has found a suitable model for academic and administrative management in the future ODL contexts. Currently, the blending and integration of high- with low-technologies is the best option to meet learners' needs in China today.

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The Emergence of Open-Source Software in China

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Abstract

The open-source software movement is gaining increasing momentum in China. Of the limited numbers of open-source software in China, *Red Flag Linux* stands out most strikingly, commanding 30 percent share of the Chinese software market. Unlike the spontaneity of open-source movement in North America, open-source software development in China, such as *Red Flag Linux*, is an orchestrated activity wherein different levels of China's government play a vital role in sponsoring, incubating, and using open-source software, most conspicuously, *Red Flag Linux*. While there are no reports on open-source course management system in China, there are reports on the study and use of Western open-source course management systems for instruction and learning in Chinese higher education institutions. This paper discusses the current status of open-source software in China, including open-source course management software and associated tools and resources. Importantly, it describes the development model of *Red Flag Linux*, the most successful open-source software initiative in China. In addition, it explores the possibility of Chinese higher education institutions joining efforts to develop China's own open-source course management system using the open-source development model established in North America. A timeline of current and major open-source projects of significance in China is provided. The paper concludes with a discussion of the potential for applying the open-source software development model to open and distance education in China.

Keywords: online learning; open-source software; online communities; China

Introduction

There are increasing reports related to open-source software initiatives undertaken in China. For example, China Open-Source Software Promotion Union (COPU) has recently established a 'think tank' comprising 19 prominent open-source executives from around the world. This think tank meets annually to advise COPU on promoting adoption and development of the open-source software in China (Lemon, 2006). Different levels of Chinese Governments have begun to install open-source software. To help in this initiative, the Chinese Ministry of Information founded the open-source Software Promotion Alliance to encourage the development of China's open-source software industry (Marson, 2005). In addition, the French Atomic Energy Commission and the Chinese Ministry of Science and Technology agreed to develop a new low-cost, high-performance open-source software platform, to form ". . . a complete chain of compatible open-source systems" for China (Gasperson, 2004, ¶ 7). In August 2004, Chinese software companies

Red Flag Software, Beijing Co-Create open-source, Zhongbiao Software, Wuxi Evermore Software, Kingsoft, and Beijing Redflag Chinese 2000 joined forces with *IBM, Hewlett-Packard, Intel, and Novell*, to form the China open-source Software Promotion Alliance, China's first open-source software organization. This alliance is aimed at cooperating in *Linux* development, promoting open-source development and application in China, and driving exchanges and cooperation of open-source communities in northeast Asia (Legard, 2004). Not surprisingly, such increasing interest in open-source software. This activity is also evidenced on *Google*: A *Google* search of the word 'open-source in China' on January 4, 2007 returned 109 million webpage hits.

In spite of all the buzz, however, open-source software is a more recent phenomenon in China than in North America. There is limited open-source software available locally and there is no report yet regarding mature open-source communities in China. For many Chinese educational institutions, open-source software is a merely an alternative to expensive proprietary software. Of course, there are myriad technical issues faced by China, including extremely large character sets, lack of conventional Western alphabetic sorting, failure of automatic translation engines, and so forth (Yeates, 2005).

Not surprisingly, many questions and issues are consistently raised concerning the open-source movement in China. For instance, what are the key issues of open-source movement in China? How does – or will – open-source work there? What are advantages and disadvantages of applying open-source to Chinese higher education, and to open and distance learning in China in particular? Through telephone and email communications with various scholars in China, coupled with an in-depth analysis of related reports, publications, and other data acquired from the Internet on the current status of open-source software development and associated open-source models in China, we explore some answers to the above questions and the potential for a development model that may be applied to higher education, and, to open and distance learning in China, in particular.

Open-source Software and Development Model in China

To a large extent, the success of open-source software in China is closely linked to '*Zhong Ke Hong Qi*,' a Linux operating system branded under the *Red Flag* name developed and distributed at the Software Research Institute of The Chinese Academy of Sciences. Founded in 2000, *Red Flag Linux* has been upgrading its product and services steadily and is poised to be an effective alternative to *Microsoft's Windows* operating system in China (Red Flag Linux, 2005; Wikipedia, *n.d.*, a). On November 11, 2005, Red Flag Linux 5.0 was published as a comprehensive desktop operating system (Red Flag Linux, 2005; Wikipedia, *n.d.*, a). Currently, the product of Red Flag Linux consists of:

- Red Flag DC Server 5.0 (红旗数据中心服务器5.0)
- Red Flag Linux Desktop 4.1 (红旗Linux桌面版4.1)
- Red Flag Linux Workstation 5.0 (红旗Linux工作站5.0).

There is a high resemblance in terms of desktop operations and icons between *Red Flag Linux* and *Windows NT*, which, according the *Red Flag Software Co., Ltd.*, eases conversion and change processes related to operating system transition. It is believed that the manageability and ease of

use of *Red Flag Linux* are improved significantly from *Red Hat Linux* [a popular Linux distribution assembled by *Red Hat* in Raleigh, North Carolina, USA. The open-source version has been released in the name of Fedora Core since 2003], while the *Red Flag Linux's* internal structure is similar to that of *Red Hat Linux* (Red Flag Software Co, 2006; Wikipedia, *n.d.*, b). In fact, according to a recent report, about 30 percent of desktops in China now use *Linux* (eWEEK.com, 2005).

From its inception, *Red Flag Linux* was a government initiative that aimed at developing China's open-source software industry. As such, governments have been behind the *Red Flag Linux*, with government-owned Shanghai NewMargin Venture Capital and CCIDNET Investment, a venture capital arm of the Ministry of Information Industry, as the two largest financial shareholders of *Red Flag Linux*. The Chinese Government's enthusiasm for open-source software is partly due to lower cost, partly due to benefits to the local industry, and partly due to cultural and political reasons – in particular, distrust of American imperialism (Marson, 2005).

Linux does not require user licenses, so it is economically accessible for many institutions and individuals who cannot afford proprietary software. As part of these economic initiatives, by supporting *Red Flag Linux*, the Chinese Government hopes to create and grow its own information technology industry, along with a user-base that uses such Chinese technology. It is also a way to combat software piracy. Indeed, a recent study found that 90 percent of all software used in China was pirated (Trombly & Davis, 2005).

Culturally and politically, some members of the Chinese Government have been concerned that there could be secretly embedded codes in *Microsoft* software that the U.S. Government can manipulate, which would allow the U.S. to bring down China's computing infrastructure. Not too surprisingly, "the Chinese Government is a bit paranoid about having proprietary code; it is worried about a back door into its systems," according to Madanmohan Rao, a research director at the Asian Media Information and Communication Centre (Marson, 2005, Summary, ¶ 11).

Although no relevant report is available, the development of *Red Flag Linux* is likely an orchestrated endeavor organized by the Software Research Institute. The Software Research Institute is a government institution wherein most, if not all, members of developing community are from the same institution and are physically clustered together. It is likely that the development team is hierarchical since it is mainly based on an existing organization. Consequently, it may be reasonable to expect that a higher level of efficiency, and possibly, higher effectiveness, exists in terms of version production than a non-institutional open-source development community that is *laissez-faire*. Moreover, the product can expect a fairly extensive user-base, simply because it is supported by different levels of the Chinese Government.

Local, provincial, and national Chinese Governments, indeed, have supported the product by installing and using *Red Flag Linux*. Among them are the National Ministry of Science, the Ministry of Statistics and the National Labour Unit, the China Post, the Chinese Academy of Sciences, the National Foreign Exchange Management Bureau, the Custom General Office, China Tobacco, the Digital Library project of universities, the Public Security and China Banking Regulatory Commission, and the National Development and Reform Commission (Red Flag Software Co, 2006). Beijing municipality, the Chinese capital, was also reported to have installed *Linux* on 2,000 desktops. Clearly, the future for *Red Flag Linux* looks very bright in China. In fact, the Chinese Government has recently announced that all government agencies are required to use only "locally produced software" with a goal of 100 percent compliance by 2010 (DeGroot, 2006, A Boost for Linux? ¶ 2).

While the focus in this section has been *Linux*, it is not the only open-source initiative presently occurring in China. In fact, there are a few other less-known open-source Chinese software projects that, because of their insignificance in terms of user base and influence, are not discussed here.

Clearly, there are a plethora of benefits and opportunities related to the open-source software in China. Basically, the open-source model of software development, through *Linux*, has shown and provided the Chinese people with an alternative method for software development that is now considered as an effective approach to combat problems linked to software in China: piracy, security, and high cost. In addition, use of open-source software extensively for effective learning and instruction promises great potential for the public at large, and for higher education and open and distance learning, in particular. As is discussed in the next section, the Chinese higher education sector was among the earliest advocates of open-source software and has been playing an increasingly vital role in advancing open-source software in China.

Open Source Software and Higher Education in China: Reality and possibilities

Financing has been one of the driving forces behind open-source software development in China (Miro International Pty Ltd, 2006; Wang, 2004). As a developing country, China was ranked by the World Bank (2004) as 118 in terms of human living standards, based on the data of "Atlas Methodology"¹ and "Purchasing Power Parity."² Interestingly, higher education institutions in China have always had severe financial constraints similar to their Western counterparts in terms of base budgets for information technology (IT) licensing fees, training, and support required for application software (Hu, 2005; Yeats, 2005). Financial constraints faced by Chinese colleges and universities, however, tend to be more acute than their Western counterparts primarily because China is a developing country with a per capita GDP just over US \$1,000 in 2003. Open-source software, such as *Linux*, may therefore be a potential solution to ameliorate financial constraints faced by many higher education institutions, and address issues of software piracy that is currently widespread in China.

Besides various financial constraints and considerations, open-source software also is viewed as an opportunity for China to utilize millions of talented, university-educated individuals in its quest to develop its own brand of copyrighted software to combat the monopoly of Microsoft in China's software market (China Economic Net, 2004; GEEK.com, 2000; MacNewsWorld, 2003). Indeed, as of 2003, China had 11,736,000 undergraduate and 501,000 graduate students attending colleges and universities (Chinese Ministry of Education, 2005; Huang & Zhou, 2005). Each student is exposed to course-related, as well as institutional software decisions, on a daily basis. The resulting knowledge of software tools, features, and functionalities among such a large number of college educated individuals yields considerable 'people power' when it comes to the development of open-source software. With such power, open-source solutions offer opportunities not only to control costs, but also expanded access to the tools students need to learn, as well as engage in collaborative projects.

According to research, one of the earliest open-source software programs introduced to higher education institutions in China was likely *Scilab*, an open-source numerical computational package developed by the French National Institute for Research in Computer Science and Control (INRIA) for system control and signal processing applications. As early as 2001, The Sino-French Laboratory in Computer Sciences, Automation, and Applied Mathematics (LIAMA), together with a cluster of Chinese universities and INRIA began to promote *Scilab* in China ". . .

to strengthen the research exchanges and collaborations between Chinese and French researchers via the platform of Scilab" (Hu, 2005, p. 3) . Based on the success of the *Scilab* project, INRIA and Advanced Computing Technology of the High-Tech Research and Development Program (HTRDP), also known as Program 863, signed a memorandum of understanding on November 4, 2005 to promote the adoption of open-source middleware worldwide. Some of the Chinese universities involved in this collaboration included The Beihang University, Peking University, National University of Defense Technology, and the Institute of Software of Chinese Academy of Sciences (ObjectWeb, 2005).

One case of an open-source software application within a higher education institution was reported by Wang (2004) who was the IT person looking after the campus Intra/ Internet at Tourism College, Jinan University in Guangzhou, Canton, China. The tourism college had wanted to build its own Intranet with Internet access, but was unable to do so because it was handcuffed by a limited budget. Having downloaded *Linux SAMBA* and purchasing an *IBM21 Y* server, the college built its first Intranet for staff to share files and print documents. Next, the college upgraded its *Linux* to *Red Flag Linux 2.0* and built a Web server capable of high-speed Internet access.

Although there are not many reported cases of open-source applications in higher education institutions, *Red Flag Linux* is on its way to widespread adoption and use in China, including extensive use within higher education settings. Moreover, the business model of open-source software development has been evolving from initial *Linux* companies such as *Red Flag Linux* under the Software Research Institute to larger, open-source communities comprised of mostly higher education institutions. In June 2005, for example, the Zhengjiang Linux Center (ZJLC) and over 70 universities established China's first Leadership of open-source University Promotion Alliance (LUPA) to create, innovate, and modernize the nature of open-source (LUPA, 2006). Three months later, LUPA established Lupaworld (i.e., LUPA 开源社区), "a new open-source community" where members exchange ideas and hone skills related to open-source (Yang, 2005, ¶ 3). Today, LUPA has its own website and consists of over 100 universities including such top universities as Qing Hua, Peking, and Zhejiang (LUPA, 2006). A similar initiative was announced in November, 2005, when 27 universities and Guangdong Linux Center (GDLC) set up the Guangdong Leadership of open-source University Promotion Alliance (GDLUPA). The GDLUPA has founded several Linux Practical Bases to train university students as *Linux* programmers. Ultimately, GDLUPA hopes that those students will help *Linux* diffuse more fully within China as they take their skill-base with them to wherever they may end up working after graduation (International Open-Source Network, 2005).

One recent development in open-source software applications within Chinese higher education worth noting, is the *localization* of open-source software systems from Western countries. *Localization* is a term used by Chinese scholars to mean customization of software into Chinese. In fact, Beijing University, mentioned above, has taken a leadership role in this regard by localizing three open-source software products: 1) *Websurvey* (a course survey and evaluation system); 2) *Sakai* (a course management system) and; 3) *EduCommons* (an open courseware tool). At the present time, the university is planning for use of other open-source systems such as *uPortal*, *Dspace*, and *Fedora* (Zhao, 2006). In addition to these efforts, Beijing University of Science and Technology and the University of Guangxi Nationality have also been using *Sakai* for their respective course management systems.

Perhaps the best known locally produced open-source project in education might be the China Quality OpenCourseWare (CNQOCW, 中国精品课程导航) project initiated by the Chinese Ministry of Education, Massachusetts Institute of Technology (MIT), the William and Flora Hewlett Foundation, and Dr. Fun-Den Wang in 2003 (CORE, 2007a). CNQOCW, like MIT's OpenCourseWare initiative, aims to share quality Chinese educational resources with the world. In effect, opencourseware projects, which are now evident around the globe – notably in the USA, UK, Japan, Vietnam, India, and so forth – place course materials or resources on the Web using open-source tools such as *EduCommons* developed by Utah State University (Johnstone, 2005). Such resources could include a course syllabus, assignments, lecture notes, instructor *PowerPoint* slides, tests, readings, and various audio or video files (Jaschik, 2006).

While learners can browse and use such resources and materials, there typically is no instructor or tutor grading one's work, nor is any course credit typically assigned for completion of such materials. The materials are made available to anyone with Internet access. This means that information can be disseminated to potential students, along with the marketing of high-quality courses. Universities such as Tufts University, MIT, and the Johns Hopkins University in the United States, the Open University in the United Kingdom, Waseda University in Japan, and the National University of Vietnam, are among the initial leaders of the opensourceware movement.

China too, wants to be a leader in this area. In 2006, 751 national-level quality courses were selected from member universities nationwide under the supervision of Chinese Ministry of Education, which were subsequently translated, assembled, and published on the CORE site (CORE, 2006b). CORE stands for China Open Resources for Education (中国开放式教育资源共享协会). China's Ministry of Education plans to publish 1,500 national-level quality courses on the CORE website by the end of 2007. As noted in Table 1, the lead universities in CORE include Tsinghua University, Peking University, Beijing Normal University, Beijing Jiaotong University, Dalian University of Technology, Central South University (CSU, Xi'an Jiaotong University, Central Radio and TV University, Sichuan University, Zhejiang University, Tibet University, University of International Business and Economics, and Northeast Agricultural University) (COREd, 2007b). These are among the China's most prestigious universities.

In addition to CORE, there are efforts being made by volunteers at the Opensource Opencourseware Prototype System (OOPS 開放式課程計畫) project to translate MIT's OCW courses (including video lectures) into Chinese (Lin, 2006; Lin & Lee, 2006). The OOPS project has two websites for translated MIT courses, one for traditional Chinese and one for simplified Chinese. Unlike CORE, the OOPS project is based in Taiwan.

The OOPS project was initiated and originally self-funded by Lucifer Chu, a young entrepreneur who is widely known for his efforts in translating the *Lord of Rings* books to Chinese as well as in founding and directing The Foundation of Fantasy Culture and Arts (Lin, 2006). Among Chu's mottos are that "perfect translations do not exist" and "collective minds are better than a single translator" (*personal communication*, May 26, 2006, ¶ 1). His business card, in fact, indicates that his title is the "Janitor of OOPS." According to Chu (*personal communication*, January 1, 2007), OOPS has 2,012 volunteer translators, 1,125 courses which have been adopted for translation, and 639 courses near completion in terms of translation. According to Chu, as of January 1, 2007, 126 open-source courses at MIT have been translated into Chinese, while many more are currently in the process of being translated (OOPS, 2006). Interestingly, Chu's army of volunteers, which, unlike its CORE counterpart, is based on an open-source model of

volunteerism, not only does translation work but also editing, proofreading, technical services and support, administrative support, and marketing and promotions. These volunteers come from countries around the globe, but most are from Taiwan and mainland China. Given the number of courses adopted for translation, as well as those completed, when combined with the high energy, talent, and charisma, and general effusive nature of Chu, this project has been attracting much attention, including recent funding from the Hewlett Foundation, along with fascinating research into the OOPS translation culture (Lin & Lee, 2006). Of course, there is also some pointed criticism and pervading tensions in that like *Wikipedia*, OOPS relies on volunteers from all walks of life, not translations purchased from high ranking universities and institutes.

Users of *Moodle* are also found in China, in four versions – Chinese (simplified), Chinese (Simplified) UTF8, Chinese (Traditional/ Big5), and Chinese (Traditional/ Big5) UTF8 (Coppola & Neelley, 2005; Moodle, 2005b; Wikipedia, *n.d.*, a). While at present there is no accurate number available regarding institutions using Chinese versions of *Moodle*, Beijing University is one of the universities reported to have been using *Moodle* (Zhao, 2006). Our count of *Moodle* sites in mainland China (Moodle, 2007) was well over 100, including Peking University and Tsinghua University, while Taiwan had nearly 300 sites listed including Aojiang High School Online(鳌江中学在线教学平台), along with other primary, junior high, and secondary schools and higher education institutions. Martin Dougiamas (*personal communication*, January 4, 2007), the founder and developer of *Moodle*, advised that there was so much interest and activity related to *Moodle* in China that one university he visited in Beijing in 2005 had approximately 20 educational technology Masters and Doctoral students conducting research on it. Such intense research on *Moodle* could be viewed as a sign of the acceptance and growing importance of open-source software within Chinese higher education.

Open-Source in China: The momentum builds

A striking feature of those open-source initiatives in China is that the Chinese government is determined to have open-source software substitute for *Microsoft's Windows* operating systems and associated software, and, at the same time, localizing Western course management systems. As a result, minimal efforts have been reported on the development of course management systems designed to meet the needs of educational organizations within China. Another interesting feature is that those open-source projects in existence, most notably the *Red Flag Linux*, have been initiated, developed, and distributed by a software research institution under China Academy of Sciences, with limited, if any, contribution from higher education institutions. Although colleges and universities have become increasingly involved in the *Red Flag Linux* project recently, such involvement focuses primarily on programming skills and proliferation of open-source software (ChinaTechNews.com, 2005; eWEEK.com, 2005; Hu, 2005; Huang, 2006; International Open-Source Network, 2005; Zhao, 2006). There is no reported educational open-source project initiated by colleges and universities in China which is similar to *uPortal*, *Sakai*, or *Moodle* in North America. Nor are there any colleges and universities that have developed and diffused similar course management systems in China akin to *Moodle* or *Sakai*. This will likely change, however, as certainly in the coming years we will see significant development in such open-source software within China's higher education sector.

Considering the financial constraints that over 2000 Chinese colleges and universities are currently experiencing, and which will not subside for the foreseeable future, as well as the massive number of university-educated individuals in China, we are of the opinion that Chinese colleges and universities, like their counterparts in North America, can and should join hands to develop education-related open-source software. Such software development will not only

increase capacity for higher education institutions and organizations in China, but form the starting points for partnership discussions with colleges and universities in other countries involved in the open-source movement or seeking new opportunities. The education-related open-source software movement in China will not only address financial constraints faced by most educational institutions in China, it promises to build upon and expand the social and intellectual capital that each participating organization has to offer. Of equal significance, the open-source movement will tap the vast pool of talents each higher education institution holds, nurturing their initiative and innovation, as well as their retention and loyalty (Chinese Ministry of Education, 2005).

Forming a consortium is one option for colleges and universities to become involved in education-related open-source projects in China. Based on the experience of *LionShare*, *OSPI*, and *Sakai*, several Chinese colleges and universities with similar needs and resources – perhaps backed by a key software vendor or foundation – might collaborate to develop a course management system on the basis of existing courseware or online projects the member institutions currently use. Further, the establishment of LUPA as well as GDLUPA offers the opportunity for software vendors and higher education institutions in China to delve one step further than simply promoting programming skills and disseminating, proliferating, and diffusing open-source software. Chinese colleges and universities can also be seen as 'greenhouses' for open-source course management systems and other software that not only meet the specific needs of participating institutions, but, equally important, nurture and encourage the initiative and innovation of the tens of millions of talented individuals studying at colleges and universities within China.

The open-source model is gaining momentum in China, which in turn is creating a favorable situation for Chinese higher education institutions to initiate highly visible open-source projects. On December 26, 2005, for example, China announced the establishment of the open-source Community of China with three founding partners: 1) the Center of Software and Integrated Circuit Promotion (CSIP) under the Ministry of Information Industry; 2) the China OSS Promotion Union (COPU), and; 3) the China Linux Industry Strategic Alliance (ChinaTechNews.com, 2005). According to ChinaTechNews.com (2005) the goal of The open-source Community of China is to create an atmosphere for open-source software development through government guidance, active participation of enterprises and individuals as well as domestic and international cooperation.

Although no higher education institution was represented within this open-source community, it does not mean that Chinese colleges and universities cannot join the community through (domestic) cooperation. And while no open-source course management software or other system or tool specific to higher education was mentioned in the announcement, it does not imply that such systems or tools will not emerge from this effort. Indeed, it may be an excellent opportunity for some colleges and universities to combine forces – both in terms of financial and human expertise – and take the initiative and build their own open-source projects. Indeed, with support from the Chinese Government, universities are taking initiative to tap the application, and, possibly, the development of open-source course management systems in Chinese higher education. For instance, CORE convened an Open Education Conference 2006 in Xian, China from September 6 to 9, 2006, its third such conference since its inception in 2003. Participants were administrators and academics from Chinese and American universities, as well as representatives from the William and Flora Hewlett Foundation and the International Engineering Technology Educational Foundation, two US foundations involved in funding the CORE project

and now the OOPS project as well. Of the 20 presentations at the conference, seven were on, or related to, open-source software or courseware (CORE, 2006b).

Open-Source Movement in China: Approaches and milestones

The open-source model of software development did not find its way into China until 1999, when *Red Flag Linux 1.0* was released by *Red Flag Software Co., Ltd.* Since its inception in 1999, there have been numerous open-source projects undertaken by individuals and organizations in China, with some open-source projects playing a more significant role in advancing the open-source model of software development than others. Appendix 1 presents a brief introduction to some of the open-source projects or events in China that we feel are of significance in the advancement of open-source model of software development.

A further look into the approaches of the open-source projects reveals that, in China, open-source projects have been generally initiated by organizations with government support. For example, Red Flag Linux, the only reported financially successful open-source project in China, was initiated by the Computing Software Research Institute under the Chinese Academic of Sciences, a quasi government institution at the national level dealing with scientific research. As such, the initiative aimed at addressing the needs of organizations guided by the government, rather than individual needs. Scilab, which involved many Chinese universities, was another open-source project initiated by a government initiative between China and France.

While most open-source education-related projects in North America typically involve a few closely linked collaborating universities, a similar endeavor in China typically involves ten or more universities (see Table 1). There are advantages and disadvantages of each approach to open-source development. One advantage of involving many institutions is the availability of a vast pool of talent for the project. Another advantage is the financial resources individual institutions bring with them (Wheeler, 2004). Larger partnerships can simultaneously address issues related to achieving sustainable economies at the institutional level, while at the same time nurturing innovation and deep learning among students and instructors. Despite such advantages, however, challenging and dysfunctional organizational issues might arise due to too many competing member interests and agendas to coordinate. When such challenging conditions occurs, efficiency can be compromised. There might also be issues related to dominating and being dominated (Daft, 2004), with some member institutions playing a more prominent role than others.

Finally, it seems that the open-source movement in China is gaining momentum as more news related to open-source is reported in recent years. Most of this news, however, is related to open-source operating systems such as *Red Flag Linux*, or the localization of Western course management systems such as *Sakai*, and not to innovations and independent development of open-source software related to education such as course management software or other educational opportunities. As such, it appears that China is experiencing what North America accomplished in the early 2000s. What higher education institutions are currently developing and implementing in North America in terms of open-source software, as well as their many collaborative efforts, conferences, and forums (Pan & Bonk, *in press*), may serve as examples to which Chinese higher education institutions might aspire – to address or perhaps find and expand upon areas in which China can take a leadership role in the open-source movement.

A salient feature of the open-source model is distributed development. Raymond (1997), for example, noted that the source code of the prototype software is open and freely available to the

users who are potential co-developers, even though the source code only has limited functionalities. This 'gift culture' and distributed development is further manifested in the Open-source Initiative's (2007) introduction to the idea of open-source: "When programmers can read, re-distribute, and modify the source code for a piece of software, the software evolves. People improve it, people adapt it, people fix bugs" (¶ 2). This is a gift culture that allows individuals to access source code freely. In effect, distributed development calls those same people, in one way or another, to participate in improving the prototype such that it becomes more sophisticated over time (i.e., equipped with additional and more stable functionalities). This give-and-take process, in turn, creates an obligation for people to give back when a gift is given (Ubiquity, 2004; Weber, 2006). Of course, the values and beliefs of the giver may also be passed on to the recipients, a dynamic which therefore binds people together.

Open-Source Software for Open and Distance Learning in China

Distance and e-learning development in higher education is increasingly researched, discussed, and documented in both Chinese educational systems. For instance, Zhang and Huang (2006) conducted a study on e-learning in Taiwan's higher education and found that distance education in Taiwan, especially that related to e-learning, targets traditional full-time students – not non-traditional individuals, such as full time workers. Equally problematic, according to government regulations, distance education credits can only consist of a one-third maximum of a student's total required credits for any degree program.

Zhang and Huang (2006) also report that no distance degree program exists in Taiwan. Instead, e-learning courses are typically supplementary courses offered in highly-demanded subject areas such as Literature and English Language, Engineering, and Management. As such, e-learning in Taiwan has shades of elitism, given that e-learning courses are not made available to all students, including non-traditional students. Indeed, one must first pass the national entrance exam and be admitted as a traditional full-time student to be eligible to take an e-learning course in Taiwan. Zhang and Huang also note that e-learning course credits are non-transferable among universities, unless a special arrangement has been made between the institutions concerned. Moreover, they found that a 'shovel-ware' approach is typically used wherein the same materials and format used in face-to-face course delivery are simply digitized for e-learning delivery.

Distance education in mainland China takes four forms: 1) educational CD display centers, 2) satellite TV learning centers, 3) networked computer labs, and, more recently, 4) Web-based learning (Deng, 2005; Potter, 2003; Zhang, 2005). There are over 15.8 million non-traditional students who take distance courses offered in one of these four forms (Wang & Kreysa, 2006). One of the major distance education providers is the Central Radio and Television University (CRTVU 中央电大) with over 100,000 students enrolled. Increasingly, the Internet is being used in China to make education available to more students with more flexibility (Zhang, 2005). Chinese distance educators utilize such methods as personalizing instruction, relating to prior experience, assessing student needs, building effective learning climates, and participating in the learning process.

Yet, as with the situation in Taiwan noted above, those in mainland China also typically view themselves as merely knowledge providers and see distance education as the mere duplication of the classroom experience in their adoption of similar 'shovel-ware' instructional methods found in Taiwan (Potter, 2003; Wang & Kreysa, 2006). Chinese distance education method is seen as teacher-directed (content-centered), information-based, and test-driven (Wang & Kreysa, 2006).

As such, distance education is often denigrated for its focus on lower-order thinking skills such as knowledge, comprehension, and memorization, while instructional design principles and models are often ignored (Potter, 2003; Zhang, 2005). It seems that mass transmission of knowledge is favored over interactive, engaging, and thoughtful pedagogy.

The distributed development or 'gift culture' of the open-source model is applicable to open and distance learning through the ease and flexibility of learner participation in a virtual community. Access to a virtual community can result in software development that can accommodate the diverse needs of online learners and instructors at different stages of their life cycles and online experience and can help lead to effective learning and instruction (Anderson, 2004). A virtual community of practice is possible among Chinese students, instructors, and open-source software developers; it can focus virtual community members on open and distance learner needs and provide continued results of pilot testing. At the same time, Chinese open and distance learners can share their ideas and needs when using the CORE or OOPS systems or any other open-source resource, tool, or system development available to them. Communities of distance learners as well as online instructors, can provide ideas in discussion forums, online communities, and interest groups. In effect, as with open-source software development, such online forums provide a world of possible human assistance and a distributed development culture.

Anderson (2004) notes that such transactions typically occur through asynchronous communication tools and are grounded in existing knowledge contexts. When this occurs, open and distance learners and instructors can increasingly look at things from similar paradigms and interact with each other and negotiate meanings out of "a common ground of interest and understanding" (Bonk & Cunningham, 1998, p. 31). Consciously or unconsciously, such open and distance learners use the language and act in ways that are acceptable to them. A culture, thus, begins to form that unites online learners and instructors and makes them feel an increasing sense of belonging to each other. Various participant interactions afforded by the Web's communication tools can enhance educational transactions in this virtual community, including student-student interaction, student-teacher interaction, student-content interaction, teacher-teacher interaction, teacher-content interaction, and content-content interaction (Anderson, 2004).

Now imagine such virtual communities of online learners and instructors impacting the open-source movement in China. As indicated above, there are myriad outlets and communication flows for idea and knowledge sharing which can enhance the development, use, and evaluation of open-source software tools and resources. But will open-source projects in the field of higher education take advantage of them? And, if they do, how will this be made evident? Clearly, the givers need not only be software programmers and developers; users, too, have real power in such environments.

At the same time, the expanded possibilities afforded by open-source models can be overwhelming to distance learning instructors as well as students. It remains a challenge to maintain open and distance instructors and learners' interest and commitment to the projects they are involved in because of the spontaneous and informal aspects of participation. Why would online learners or instructors offer advice when they are in the midst of a course and such advice will not impact their grades or course performance, if a learner, or their pay, if an instructor? Why share? What do they receive in return? And if they do feel an impulse to share, how will instructor or student needs within open-source software be expressed, documented, and addressed? Just who will listen to their needs and how will they respond? Will they have training in 'customer' support? Where will resources emerge for addressing software changes that such a learning community of educators and students might suggest?

In China such communities of instructors and learners face additional challenges. For instance, open and distance learners face a credibility issue, especially since a mere 4 percent of the universities in China credit the online courses offered by another university, while only 15 percent of Chinese universities and colleges are offering online (credit) courses (HC360.com 慧聪网, 2005). While such numbers significantly lower the potential strength of such a culture today, it is conceivable that in just a few short years, the tide of change related to acceptance and implementation of online learning in China will place millions of online learners and thousands of online instructors in positions of influence related to the open-source movement. As Huang and Zhuo (2006) and others observe (Deng, 2005; Zhang, 2005), while numerous problems exist, blended and fully online learning will continue to develop in China, as well as in Taiwan, and other Chinese speaking countries and regions (Zhang & Hung, 2006) during the next few years.

Conclusion

In this paper, we analyze the status of open-source development in China. We examine the current situation of open-source initiatives undertaken in China and find few and limited open-source projects that are geared to the needs of educational institutions. We believe that the lack of open-source course management software offers opportunities for Chinese colleges and universities to build open-source course management software on their own – or in partnership – with other institutions and organizations. Given these open-source trends of the past decade, and especially the past few years, there are many exciting opportunities for research and development within higher education in China and beyond.

Gift culture and distributed development enable the success of open-source software such as *Linux* and the birth and growth of open-source courseware projects such as CORE and OOPS. Gift culture and distributed development might simultaneously help build and consolidate a community of practice of open-source software developers within higher education; especially related to online learning tools and resources including instructional designers, online educators, and virtual students. This gift culture and distributed development also can be mirrored open and distance learning practices by building and reinforcing a community of open and distance learners, online instructors, instructional designers, and other educational professionals who lend insights into their needs, as well as potential directions of the open-source movement, that can benefit online learning in higher education and other sectors.

Given the potential for enormous demands for online learning in China, if and when that happens, the influence of China in the open-source movement will be extensive and potentially relentless. As that occurs, no longer will the thrust within the open-source movement be from North America to China, but, instead, it will be pushing, and not too gently, from China back to North America and all other parts of the world. This reverse migration of open-source ideas, tools, and resources is something, of course, which the entire world of higher education will be intently watching. Stay tuned!

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Appendix 1. Important open-source Projects in China and in North America

Date	Sponsor	Project	Significance
1999	Red Flag Software Co., The Chinese Academy of Sciences	<i>Red Flag Linux</i>	First open source computer software project in China.
2001	INRIA, France and LIAMA, China	<i>Scilab</i> Workshop	First open source software in China focused on higher education
2002	Chinese and French governments and Universities	<i>Scilab</i> Contest	The contest helped to promote educational open source software in China.
2002	Wikipedia, the free encyclopedia	Chinese Wikipedia	First open source content project in China.
2003	William and Flora Hewlett Foundation and International Engineering Technology Educational Foundation	China Open Resources for Education (CORE) to create high quality courseware in China	First OpenCourseWare in China with some Chinese university courses freely available to anyone anywhere anytime. CORE participants are transcribing MIT opencourseware to Chinese. Universities involved in CORE include Tsinghua University, Peking University, Beijing Normal University, Beijing Jiaotong University, Dalian University of Technology, Central South University (CSU), Xi'an Jiaotong University, Central Radio and TV University, Sichuan University, Zhejiang University, Tibet University, University of International Business and Economics, and Northeast Agricultural University
2004	Red Flag Beijing Co-Create Open Source, Beijing <i>Redflag Chinese 2000</i> , <i>Hewlett-Packard Co.</i> , <i>IBM Corp.</i> , <i>Intel Corp.</i> , <i>Novell Inc.</i> , <i>Red Flag Linux</i> .	China Open Source Software Promotion Alliance	Start of a new stage in the promotion of open-source software in China and across northeast Asia.
2004	Fantasy Foundation (headed by Lucifer Chu) and more recently the Hewlett Foundation has provided some funding to continue the OOPS initiative.	Opensource Opencourseware Prototype System (OOPS)	First open source project to translate MIT OpenCourseWare courses into Chinese.
2005	Zhengjiang Linux Center (ZJLC) and more than 70 Chinese universities	Leadership of Open Source University Promotion Alliance (LUPA)	Open source software vendor and such prestigious universities as Peking, Qinghua, Zhejian, join hands to promote open source software in higher education
2005	China OSS Promotion Union, China Linux Industry Strategic Alliance, Center of Software and Integrated Circuit Promotion	Open Source Community of China	First national level alliance to promote open source in China
2006	CORE	Open Education Conference 2006	Promoting open source courseware and open source software in China; in Chinese higher education, in particular.

Notes

1. Atlas Methodology, or Atlas Method is a statistic method that the World Bank uses to calculate gross national income (GNI) and GNI per capita in U.S. dollars in order to reduce the impact of exchange rate fluctuations in the cross-country comparison of national incomes.
2. Purchasing Power Parity is the method of using the long-run equilibrium exchange rate of two currencies to equalize the currencies' purchasing power. A purchasing power parity exchange rate equalizes the purchasing power of different currencies in their home countries for a given basket of goods. These special exchange rates are often used to compare the standards of living of two or more countries. The adjustments are meant to give a better picture than comparing gross domestic products (GDP) using market exchange rates.

