A Study of Distance Education at Hong Kong Universities

Submitted in Partial Fulfillment of the Requirements of the
Interactive Qualifying Project Program
Worcester Polytechnic Institute
Worcester, Massachusetts

Sponsoring Agency: Hong Kong University of Science and Technology

Submitted to:
On-Site Liaisons: Dr. Yu-Fong Yen, Department of Chemistry, HKUST
      Dr. Lam Lung Yeung, Department of Chemistry, HKUST
Project Advisor: Dr. Karen Lemone, Department of Computer Science, WPI
Project Co-advisor: Dr. Yiming Rong, Department of Mechanical Eng., WPI

Submitted by:

Franklin Angulo

Robert Darneille

Ryan McLaughlin

Eric Wong

Date: 23 February 2006

Karen Lemone, Project Advisor

Kevin Rong, Project Co-Advisor

Abstract

The project, *A Study of Distance Education at Hong Kong Universities*, researched the availability of distance education programs in Hong Kong. The study explored the teaching methods and tools implemented in these programs. We were able to make this information available to Hong Kong universities in order to promote organization and collaboration between the programs.

Acknowledgments

We would like to extend a special thank you to HKUST and Dr. Yen and Dr. Yeung. They have been extremely helpful as resources to our project and have been very hospitable to us during our stay.

We would like to thank the following people that contributed to our study.

Christopher Baker
Jonathan R. Barnett
Christopher Greaves
Hong Kong Virtual University Staff
Winnie Hui
ITSC Staff from Chinese University of Hong Kong
Gibson Lam
Carmen Lee
Karen A. Lemone
John Milton
Timothy Ngan
Creighton Peet
T.C. Pong
Yiming (Kevin) Rong
David Rossiter
Rex Sharman
Pennie S. Turgeon
Kate Wrigley
Kin Sun Yuen

We would like to thank student liaisons from Hong Kong Polytechnic Institute.

Li San Chan
Sze Man Chan
Liying Zhu

We would like to thank our project advisors from Worcester Polytechnic Institute.

Karen A. Lemone
Yiming (Kevin) Rong

Table of Contents

List of Tables

List of Figures

Disclaimer

All data contained in this study were collected to the best of the abilities of the persons conducting the study. Unfortunately, due to time and resource restrictions, not all data may be accurate or complete.

Executive Summary

Distance education has been developing in many countries. As more technology becomes available, the realm of virtual classrooms continues to transform. Students can now attend classes from any location around the world and receive the education that they desire. These distance learning courses utilize many tools such as video conferencing, chatrooms and online discussion boards.

Many universities in Hong Kong have created educational programs through the use of the Internet. These programs are developed with little input from people or university departments that have already had experience with them. This occurs because there is lack of information about the distance education programs available in Hong Kong.

Our project goal was to evaluate the current availability of undergraduate distance education programs in Hong Kong and find the teaching methods and tools implemented by these programs in order to promote organization and collaboration between the programs.

In order to achieve our goal, we set three objectives. Our first objective was to determine which distance education programs were currently available in Hong Kong. In order to do this, we performed archival research and conducted interviews with administrators and staff of the different Hong Kong universities. These same interviews also helped us with our second objective in which we found the teaching methods and tools used in these distance education programs.

Our final objective was to categorize the teaching methods and tools used in the distance education programs in Hong Kong universities. We organized all the information that we gathered from our interviews and archival research. We produced a list of the universities that offered distance education programs and the ones that did not. We also gathered information about different tools used in the universities to enhance the distance education programs.

After researching nine Hong Kong universities, we found that there are six universities that currently offer distance education programs and tools for undergraduate studies. Some of these programs use commercial educational tools. Many professors believe that these commercial systems are very constricting and do not allow for easy development of add-ons to meet their needs. Accordingly, some of the professors choose to create their own systems

to give them the flexibility that they desire. They also develop custom tools to be integrated into their systems to help both professors and students have a richer teaching and educational experience. These tools are able to be developed due to the structure of the government educational system in Hong Kong. This educational initiative provides funding for the different universities to create their own custom systems and tools. Although such funding is beneficial, it also leads to a lack of collaboration between universities that develop these tools.

Educational technology is rapidly progressing. Some professors believe that face-to-face instruction cannot be replaced. Hong Kong undergraduate university education appears to be moving towards a blended learning environment. This type of learning combines the "best of both worlds" – the traditional classroom and distance education. This is possible because Hong Kong is a city with excellent public transportation. Thus, most students can easily attend class.

Distance education is continually evolving and the status of such programs is constantly changing. In addition, the information presented here was gathered in only a few weeks by students who only spoke English. Due to these issues, the data presented may not be accurate or complete.

1.0 Introduction

In modern day society there are constant advances in technology, which lead to new knowledge. Worldwide the demand for higher education opportunities is increasing due to the desire to acquire this new knowledge. Furthermore, companies are looking for individuals with advanced degrees. Universities are trying to cover this educational demand with several new programs and teaching styles. Among these programs are courses that utilize both traditional classroom and newer methods of teaching remotely through the use of the Internet.

In Hong Kong, the demand for tertiary education has continually increased. People understand that they need to expand their knowledge in order to remain competitive in their fields. In addition, the local government has been promoting these higher education opportunities. In response to this, various Hong Kong universities have begun to take advantage of the Internet's potential for teaching. There are several distance education programs in Hong Kong. Unfortunately, there is very little organization and collaboration between universities regarding their distance education programs.

Numerous distance education programs are developed on a small scale or localized to a specific department within a university. This localization brings about the lack of collaboration between the programs. Many universities and departments try to start up a distance education program without any input from existing programs. Sometimes they do this because they are not aware that other distance education programs are already available.

The field of distance education and learning is continually evolving. One of the main problems in Hong Kong is the lack of information about distance education programs. There is no reference listing the universities that offer distance education programs.

This project aimed to determine the current programs, methods and implementations of distance education in Hong Kong. Through the use of interviews and archival research we determined the current availability of distance education programs in Hong Kong. We also determined the methods of teaching and tools used in these programs. In looking at this, we aimed to be able to find the different distance education programs currently available.

2.0 Background and Literature Review

Distance education refers to a situation where the student and the teacher are separated either by location or time (Williams, 1999). To overcome their separation, they can communicate using technology. Distance learning is the desired outcome of distance education (Willis, 1994).

Allen & Seaman (2005) defined several categories for courses. Online courses have eighty percent or more of their content delivered online. Another category, hybrid courses, has thirty to seventy-nine percent of their course content delivered online. At the other extreme, "face-to-face" courses have from zero up to twenty-nine percent of their course content online. Traditional courses combined with web facilitated courses form this "face-to-face" category. Table 2.1 gives descriptions for each of the course categories.

Proportion of Content Delivered Online	Type of Course	Typical Description
0%	Traditional	Course with no online technology used — content is delivered in writing or orally.
1 to 29%	Web Facilitated	Course which uses web-based technology to facilitate what is essentially a face-to-face course. Uses a course management system (CMS) or web pages to post the syllabus and assignments, for example.
30 to 79%	Blended/Hybrid	Course that blends online and face-to-face delivery. Substantial proportion of the content is delivered online, typically uses online discussions, and typically has some face-to-face meetings.
80+%	Online	A course where most or all of the content is delivered online. Typically have no face-to-face meetings.

Table 2.1: Educational Course Categories (Allen & Seaman, 2005, p. 9)

Distance education has been around since the 1880's. This type of education has evolved and currently provides many important tools for students, professors, and institutions. Distance education has its advantages and disadvantages and there is a lot of research towards finding the teaching methods and technologies that maximize the effectiveness of these programs.

2.1 Current Distance Education Programs

Allen & Seaman (2005) found that universities in the United States are offering a large number of online courses each year. This is also true of universities in many other countries

around the world. Each university has its own way of implementing its distance education programs.

The Sloan Consortium carried out a series of studies about distance education programs around the United States (Allen & Seaman, 2005). This consortium of institutions looks for ways to improve the quality of online programs. In one of the studies, it was found that 35% of the universities offering face-to-face computer and information science programs also offered online programs in this area. Also, 31% of the universities offering face-to-face health profession programs also offered online programs. Apart from computer and information science and health professions, there are no other major areas within science and engineering with considerable online penetration, as is shown by Table 2.2. In addition, growth in science and engineering areas comes primarily from public and private for-profit institutions.

	Public	Private, nonprofit	Private, for-profit
Business	51.3%	27.3%	80.5%
Computer and Information Sciences	43.0%	21.6%	51.9%
Education	30.4%	17.6%	50.8%
Health Professions and Related Sciences	35.5%	23.4%	32.3%
Liberal Arts and Sciences, General Studies, Humanities	54.6%	20.2%	55.2%
Psychology	34.4%	9.3%	26.5%
Social Sciences and History	40.7%	11.1%	31.6%

Table 2.2: Online Penetration by Discipline (Allen & Seaman, 2005, p. 8)

The studies performed by the Sloan Consortium also found that universities are offering a continuously increasing number of online courses. It is estimated that online enrollment increases by 360,000 students each year. For example, from 2003 to 2004, enrollment increased from 1.98 million to 2.35 million students (Allen & Seaman, 2005).

2.2 Technologies Used In Distance Education

Unlike earlier distance education programs, present day distance education programs are extensively intertwined with technology. Technology is a major influence on how distance learning is brought to students, and enables distance learning to reach all regions of the globe. While technology has opened up opportunities and greatly enriched distance education, it also creates some high demands for supporting a distance education program. Evolving technologies are helping to overcome the downfalls of early-day distance education

programs. Michael G. Moore writes, "In the development of distance education courses, there is no one best technology, and it is usually a combination of technologies that produces the best course in terms of meeting the learners' educational objectives" (Moore, 2003).

2.2.1 Hardware

Modern day advances in technology have changed the face of distance education. Computers are now allowing for highly interactive distance learning (see Appendix C). One of the largest advantages of present day technology is that much less equipment is required to start a distance learning program. A room full of servers is capable of providing the same services as a large number of classrooms and lecture halls.

Campus / Server Requirements

Computer infrastructure requirements on the server side can vary greatly depending on enrollment and the number and types of classes being offered. The general requirement is to be able to provide a stable web portal, adequate storage space, and a platform with which to broadcast or stream media. The requirements for a literature based curriculum could be very basic, only requiring files for the class containing not much more than text and possibly taped lectures. However, an engineering course could have lab files, demonstrations, example videos, and more. The main area of focus is still on the main portal. This is where the student-teacher interaction can occur, and also how the students can collaborate with each other. Having a stable platform to support all of this is crucial. (Note: We will not go into extreme technical details and requirements, as modern computing is changing from day to day. Every distance education program that is started is different, and the technical requirements will depend on many factors involved in that specific installation.)

Network

Modern day distance education programs rely on the Internet as one of the only methods of distributing class material. It is imperative that a distance education data center have a very reliable and fast connection to the Internet (Moore, 2003). Fortunately, any university looking to add a distance learning program most likely has a more than adequate connection to the Internet that already services their campus.

Classroom / Broadcast Requirements

A physical classroom environment is completely dependent on the nature of the distance education program. However, many studies have shown that an interactive classroom environment can provide a richer experience (Moore, 2003). Mixed-media, when used properly, is a very powerful tool in education. WPI's Advanced Distance Learning Network program heavily uses mixed-media, presenting online courses in multiple formats including taped classes, with real students, that is then streamed to the Internet. This allows for a more classroom-like experience, because rather than just watching a professor lecture, or read a presentation, the online students are able to participate in a real class, and also hear and see the feedback and questions of other students (WPI, 2005). Classroom and broadcast requirements are entirely dependent on what type of program is being developed. Having a distance classroom can prove to be a very valuable tool in a distance education program. A classroom that supports distance education could be as simple as a typical classroom with a few webcams, or something more advanced like a television studio where full broadcasts of the classroom can be made.

Media Production

A large component of teaching distance education is creating and distributing the media associated with the program. Some of this material may be part of the courses that professors have already prepared such as presentations or handouts. These can easily be digitized and distributed. However, in classes where demonstrations or streaming media are used, the demand for media production increases. One study has said that considerably more time may need to go into producing materials for a distance education program than for a traditional class (Barnes and Lawton, 1998). However with new technology, the costs of media production are decreasing rapidly. In some programs, such as WPI's Advanced Distance Learning Network, there is support staff that works on media production for the classes and even prepares some of the course materials (WPI, 2005). This turns out to be a very necessary part of distance education. While reading alone can teach us, sight and sound significantly enhance our learning experience.

Student / Client Requirements

One of the best advantages of modern day distance learning programs is that there are very few technical requirements for students participating in a distance education program.

Most distance education programs do not require much more than a computer that is less than 3 years old and an Internet connection. While some programs may have slightly more requirements, most programs generally try to develop the program in such a way as to most easily enable many people to participate.

2.2.2 Software and Course Management Systems

At the core of present day distance learning programs is what is called a course management system (CMS). A web-based course management system is a portal that facilitates a web-based distance learning program. Many of the common features of course management systems include being able to support online learning, create an effective pedagogy, allow for simple course creation and management, provide common course activities (forums, quizzes, resources, choices, surveys, assignments, chats, workshops), provide a means of synchronous and asynchronous learning, and support presentation of various types of media.

The major leaders in the market of CMS currently are Blackboard Inc. and WebCT Inc. with over 3,700 clients. (As of writing, Blackboard and WebCT have announced a merger between their two companies.) There are presently over 40 major CMS systems and this is a constantly changing number (EduTools, 2005). With the recent interest in Open Source technology, many more free CMS such as Moodle are coming into use. MIT is sponsoring the Open Knowledge Initiative, which is building public use education management software. The only real way to choose the best system is to evaluate what is required of the curriculum and staff and find a product that meets those requirements. As can be seen, the way a distance program is implemented can truly be customized to whatever is required of it. A strong platform from which to run a distance education program is one of the most important factors in starting a distance education program (Arnone, 2002).

2.2.3 Staffing

When working with a distance learning program, the staffing requirements are significantly different from those of a traditional university. There is a very different and very specialized support staff that is required beyond that of the professors teaching the course. Support staff is required in different areas to maintain computer systems and network infrastructure, provide support, create and push out the different forms of media associated with the program, and develop the digital curriculum. While in a traditional university

setting, plant operations is a large division that keeps the university running, in a distance education program, it is the IT staff that keeps it running. In regards to staff demands, the support staff is based on the size of the programs and how many courses there are; however, the faculty size is determined more by the number of students enrolled in those courses (Turgeon, 2005).

2.3 Advantages of Distance Education

As Pennie Turgeon, former director of the Advanced Distance Learning Network at WPI, explains, distance education is a topic of controversy when determining whether it is a good or a bad thing (Turgeon, 2005). There are many people who will fight for each side; however, there are a multitude of advantages to using a distance education program. Some of the advantages can be as basic as having geographic separation where the location of the physical campus is not an important factor. Other advantages involve the concept of time separation where the student is not required to attend class at a specific time, but learning can be done in a time-lapse atmosphere. Another large issue, one of the most argued, is cost. In distance education, the costs are distributed differently from those of a traditional university. These are just some of the advantages of distance education.

2.3.1 Geographic Separation

Turgeon states that access to education can many times be an issue for students (Turgeon, 2005). In the Midwest, parts of Florida, and rural parts of Vermont and Maine students have to travel 3 to 4 hours to get to the nearest university. Sometimes the university they want to go to or the one that has a program that they are interested in is even farther away. Turgeon also said that WPI has had a relationship with Seoul National University in Korea for several years. Through this relationship they solve the access issue for students in Korea who would like an education in Fire Protection Engineering. Furthermore, institutions who offer Fire Protection Engineering programs are very limited. In the United States, only Worcester Polytechnic Institute and the University of Maryland offer them. In this case, not only are students far away from the university that offers the programs they are interested in, but they also have to deal with the availability of programs. Through the use of distance education, institutions like Worcester Polytechnic Institute are able to expand their educational network and make limited degree programs available to students who are interested in them.

2.3.2 Time Separation

A fully online distance learning program allows for students to take classes around their schedules. The atmosphere of a distance education program is much more relaxed than a traditional classroom setting. This not only allows for the students not to have to worry about getting to class, but also allows for the students to have a richer experience by learning when it works best and is most comfortable for them (University of Phoenix, 2005).

2.3.3 Cost

Large scale distance education programs are beginning to lead the way to lower costs of higher education. University of Phoenix promotes programs as having "much less" cost than most universities (University of Phoenix, 2005). These cost drops are more evident in larger scale programs, where very little physical plant infrastructure is required, and only a large information infrastructure is required. A large scale university would be able to operate with a much lower staff/student ratio, but also be able to maintain a high collaboration between students and faculty through the use of technology. This is mostly able to occur by being able to reduce support staff that comes with the nature of a physical campus (i.e. maintenance, security, and athletics) and being able to replace those positions with more faculty. However, in the late 1990's Sally Lawson and Richard Barnes argued that the cost of a distance education program was significantly higher than that of traditional university program (Barnes and Lawton, 1998). It appears that the cost argument can be made both ways, and is very dependent on the university, staff, curriculum, and culture.

2.4 Limitations of Distance Education

There are some disadvantages to distance education. Since there is no face-to-face communication, honesty is a very big issue. Cheating can occur without professors knowing. Also, with new technology, both professors and students need to learn and understand the equipment. This requires more work on both sides – the teaching and the learning. Since distance learning is not face-to-face, students and professors will not have the same social interaction as in a traditional classroom setting. Finally, video conferencing does not provide enough quality to make it very effective. The administration and developers of distance education programs are trying to overcome these limitations by creating better approaches to teaching. Technology will need to keep evolving to provide better methods of communication between students and professors.

2.4.1 Student/Teacher Training

In order for distance learning to be effective, the students and teachers must be comfortable with the technology that is provided for this method of education. In the Educational and Information Technologies Journal, they state "the belief that one has the capability to comfortably interact with technology is a construct that does impact performance" (Duvall & Schwartz, 2000). Students and professors using distance learning methods can be hindered greatly without the proper training of the technologies used. Students must become familiar with the technology that is required to learn from distance education. Without this, the students do not use the equipment to its fullest potential. Professors must also learn how to use the equipment that they are given. Without this, the professors may have difficulty in conveying information to their students. Students and teachers must understand how to use the equipment before they can utilize the distance learning. People who want to participate need to do more work than those in traditional schooling because they need to get trained in the technology they will be using.

Jonathan Barnett of the Fire Protection Engineering program at Worcester Polytechnic Institute said that the first time he taught via distance education was difficult (Barnett, 2005). He was familiar with most of the technology, but he had to learn how to use other software. He also had to get his students used to the distance curriculum and with the technology that is involved.

2.4.2 Timeliness – Isolation

When taking part in distance learning, one aspect that students and teachers have to understand is that there will be very little social presence. The American Journal of Distance Education writes that, "social presence positively influences online interaction; however, frequency of participation does not represent high social presence" (Tu & McIsaac, 2002). Even though there may be video conferencing involved, it will not be able to replace the social interaction that traditional schooling has. In traditional education, students are able to collaborate with each other by meeting and working on their school work. In distance education, students typically live far away from each other or do not have the means of transportation to get together.

2.4.3 Quality of Technology

One important method of keeping social presence in distance learning is to use video conferencing. Many facilities that distance education professors use for teaching do not have the capabilities of supporting high quality streaming video. Barnett stated that a key aspect from a professor's point of view is to be able to read the students' eyes. By doing that, the professor can get signals of whether or not students understand what is being taught. With static and low quality imaging in the video conferencing, it is difficult for professors to see if the students actually understand the material being taught.

2.4.4 Cheating

Moore has been a pioneer in conceptualizing and teaching about distance education since he published his first theory in 1972 (Moore, 2005). He states that about 70% of American high school seniors and 75% of college students reported that they had cheated at some time. In distance learning, it is especially easy to cheat. Students can get an already existing paper from the Internet and modify it a little, then present it as their own work. Several methods exist to detect these types of pre-made works.

Moore (2005) says that he does not like the idea of monitoring all the work he gets to see if it is plagiarized because he can do that automatically without help. When his students submit a paper, he can recognize whether or not it is their work because he knows his students well enough. Furthermore, he does not see the point of a student doing this type of dishonest activity when they are paying so much for their education. This would be wasting the money they invested in their education.

Barnett puts a note on all his exams and homeworks that informs the students that they should submit only their work and that they agree to the terms of not cheating (Barnett, 2005). Barnett also assigns group assignments, and final presentations are usually slides with embedded audio. He agrees that some students may cheat, but he also states that they are cheating themselves.

Turgeon says that there are issues with cheating (Turgeon, 2005). On the other hand, she argues that they are no more or less than what is experienced on a physical campus. Some critics may say that someone else could be doing the work for a student in a distance education course. Turgeon argues that in a 200 student lecture, the professor has very little possibility of noticing if someone else is doing the exam or the homeworks for a student.

Turgeon explains that some distance professors give take-home exams structured in such a way that discourages cheating. Furthermore, some professors give oral exams on the telephone.

Karen Lemone from the Computer Science Department at WPI states that there are no effective methods of eliminating the possibility of cheating (Lemone, 2005). She gives timed take-home exams to her distance education students in the United States. For her students in Nepal, she has exams proctored by someone in that country. With take-home exams she gives instructions specifying that students should only look at their notes and their book and not go out to the Internet. She has no way to enforce these instructions but she believes students follow the instructions. It all comes down to trusting both the students and in the case of Nepal, the volunteer who proctors the exams.

Pace University (2000) has set up a proctoring system to ensure that students follow the guidelines when taking examinations. Students are required to find a proctor to supervise and administer any major examinations. In order to facilitate selection of proctors, students are given a list of criteria defining what type of person is qualified. Pace University (2000) also states that this proctoring system helps them carry out their asynchronous mode of instruction in an efficient manner.

2.5 Distance Education Quality Measurements

Institutions and professors need ways of measuring how effective their courses are at teaching their students. As Turgeon states, the reputation of an institution is one of the most important factors when it comes to confidence in a distance education program (Turgeon, 2005). Therefore, institutions need to maintain their highly regarded reputation by ensuring the quality of their distance education programs. Lemone adds that not many quality measuring techniques are available and the few that exist do not provide quantitative results (Lemone, 2005).

One of the major research areas of effectiveness in distance education is transactional distance. Transactional distance is defined as the psychological and communications gap resulting from the separation of teaching and learning (Moore, 1972). According to Moore's theory, the amount of transactional distance depends on three variables: structure, dialogue, and autonomy. Structure is related to the design of the specific course: objectives,

assignments, and evaluation. Dialogue refers to the communication between the instructor and the students. Autonomy is a characteristic of the distance student. It measures the amount of control and management skills that students have over their education.

Moore (1972) argues that high levels of structure combined with low levels of dialogue increase transactional distance and demand more autonomous students. On the other hand, transactional distance is reduced when there are high levels of dialogue and also a flexible structure. In this way, students receive more feedback and instruction from the professor and course materials can change to meet the students' needs. An example would be to have an attentive professor who gets feedback from the students to know which areas they need more help with. Then homework could be created to address the students' needs. The homework will help students practice and better understand the areas in which they are weak.

Moore (1972) concludes by pointing out that a successful distance learning course is determined by how effective it is at reducing transactional distance. The hosting institution and professor need to provide an appropriate structure and good quality and quantity of dialogue to meet the needs of the students.

Structure of Distance Education Courses

The structure of distance education courses consists of the methods of interaction used between students and teachers. This is drastically altered by the instructional design used in their development and maintenance.

Instructional Design

Instructional design can be viewed in several ways, as a discipline, a science, and a process. When viewed as a discipline, instructional design can be defined as the branch of knowledge concerned with research and theory regarding instructional plans and the process of developing and implementing such plans. When viewed as a science, instructional design can be defined as the science of creating detailed specifications of how to develop, implement, evaluate, and maintain learning environments aiding in the teaching of subject matters varying in breadth and complexity (Berger, 1996).

Instructional design is primarily defined as the process of designing and developing instructional materials and educational exercises to fulfill educational needs (Yeronga Institute of TAFE, 2004). When it comes to distance learning programs, an enormous amount

of effort goes into instructional design, trying to ensure that the student will learn as much as possible from the course.

Instructional design as applied to distance education is the development of course materials to be used at a distance to teach students the content the teacher wants the course to cover. The president of Penn State, Graham B. Spanier, has stated that instructional designers play a substantial role in determining the success of online education, influencing the degree to which students return to take further online courses (Carnevale, 2000). This illustrates the importance of distance education programs having good instructional designers.

WPI has instructional designers work with professors teaching distance education courses to ensure that the methods of teaching used by the professors go together with the courses' learning objectives as well as possible. Good instructional designers ensure that technology does not hinder the teacher in their efforts to teach students (Turgeon, 2005).

Dialogue

The methods of communication between professors and students are an essential component of distance education. There are two methods that are used in distance education. The asynchronous teaching method allows for students to learn when they have the time because it does not have to be in real time. Synchronous learning is when the professor teaches in real time. Blended learning, a mix between distance education and traditional classroom education, is beginning to be used. Students learn in both settings, getting the benefits of both.

Asynchronous learning is a technique where professors and students do not have to meet on a schedule. The professor can give a lecture and the students can access the lecture at another time and learn from it. "Distance education in its computer-mediated asynchronous learning format provides students with new and oftentimes markedly different learning experiences because of being location and time free" (Ivankova & Stick, 2005). It is a method that allows for students to carry on with daily activities like jobs and still be able to take courses when they have time.

There are multiple types of asynchronous learning. A property of asynchronous learning is that the methods can usually be self paced. For example, a course on the Internet using websites can be taken at any time. (Leeuwe, 2005) Another type that is similar to the website

courses is courses on CD-ROMs. Pre-recorded classes on videotapes or audio tapes can also be used in asynchronous learning (Leeuwe, 2005).

In the New School for Social Research in New York City, there are many students who take asynchronous courses. At this school, "lectures are presented online, and professors may pose questions to begin the online discussions. In a physical classroom, a lecture can last an hour and a half. In the virtual classroom, it can last for weeks" (Newman, 1996). Students are able to send e-mails to ask questions to their professors.

Synchronous learning is when the students are being taught by the professors in real time (Leeuwe, 2005). There is no time delay between the professor teaching and the students learning. Both occur at the same time and everything is done live.

There are many types of synchronous learning. There could be a live radio broadcast where students can learn from listening to the radio (Leeuwe, 2005). This method alone does not allow for students to ask questions. Another method is live television broadcast (Leeuwe, 2005). This is similar to the radio broadcast except students are able to see the professor and put a face with the words. There are multiple methods that allow for student to teacher communication. For instance, audio/video conferencing, internet telephony, and two-way live satellite broadcast (Leeuwe, 2005).

There are many techniques to teach courses through synchronous distance education. At the New School for Social Research, their main technique for distance learning is through a website that contains discussion boards and virtual exams. The software that is used for the website can keep track of specific times that the students logged on and what they previously wrote on the discussion boards. This logging software allows students to log on at any time and participate whenever it is convenient for them. This school program is very appealing to those who don't have flexible schedules due to family and/or work obligations.

At Southern Methodist University in Dallas, Texas, they have a masters program that can take place at 45 different universities. Their method of distance teaching is through video conferencing in a regular classroom. Students sitting 2000 miles away are able to participate in class discussions and lectures held at the university (Stemer, 1995).

The Fire Protection Engineering Department of Worcester Polytechnic Institute uses distance education as a primary method of teaching. The students get streaming video of the

professor along with a PowerPoint presentation. Barnett gives timed online exams to the students and is available on instant messaging programs for students to ask questions. For the class that he teaches, he is accompanied by a teaching assistant and a grader. The department does not limit its teachings to the United States. Students from all around the world having no local educational options are able to take distance classes held at WPI (Barnett, 2005).

Another method that can be used by professors to teach is blended learning. It provides students with both aspects; distance learning and traditional classroom. Students are able to learn by video conferencing, online chats, attending seminars, and workshops (Leeuwe, 2005). This blended solution gives students the opportunity to meet face-to-face with the professors and other students in the class while also having classes at a distance.

Autonomy

Autonomy is the third variable taken into account when determining the effectiveness of a distance education program (Moore, 1972). It tries to measure the discipline required from each student in order to succeed in a course. As Turgeon explains, professors also need a certain degree of discipline in order to carry out the extra work that is involved when teaching a distance education course (Turgeon, 2005).

Students

Allen & Seaman (2005) in conjunction with the Sloan Consortium performed some studies and found that 70% of the institutions that have online degrees in the United States agree that students need more discipline to succeed. Table 2.3 shows that universities without online programs have different opinions than universities with online programs when it comes to the level of discipline needed by students in distance education programs. Universities with no online programs have more opinions in the neutral category; they are not sure if students need more discipline in distance programs than in traditional programs. On the other hand, universities with online programs have clearly found that students need more discipline in their distance education programs (Allen & Seaman, 2005).

	No Online	Have Online
Agree	54.4%	70.0%
Neutral	40.5%	27.4%
Disagree	5.2%	2.6%

Table 2.3: Student's Degree of Discipline Required (Allen & Seaman, 2005, p. 12)

Professors

Distance education programs also require more effort by the faculty (Allen & Seaman, 2005). Turgeon states that faculty members who do a really good job at developing a distance education course, initially will do more work (Turgeon, 2005). Furthermore, she mentions that most professors are used to teaching in a lecture hall. Therefore, by changing their teaching techniques by making them interact online and learn the technology infrastructure, they will have a learning curve.

Lemone devotes the entire month of May to prepare for her online summer classes (Lemone, 2005). She states that this is much more time than she would take to prepare for a face-to-face course in the normal school year. On the other hand, Barnett is not convinced that it requires much more effort (Barnett, 2005). He suggests that once the professor has prepared for it once, it is much less work. In his opinion, the hard part is engaging the distance students.

Studies performed by the Sloan Consortium found that it is no harder to assess students in online courses than in face-to-face courses (Allen & Seaman, 2005). Turgeon points out that courses have a participation grade (Turgeon, 2005). In most courses this just translates into attendance. On the other hand, for distance programs it means actually participating in discussion boards with meaningful material. She argues that this provides a much richer ground for evaluation.

Another result from the studies performed by the Sloan Consortium describes how Chief Academic Officers of the universities with distance programs believe that faculty members have not accepted the value of online education (Allen & Seaman, 2005).

Contrastingly, Turgeon thinks that professors in the Advanced Distance Learning Program at WPI would agree that student learning has increased as a result of distance education.

3.0 Methods

To accomplish our goal of evaluating the current availability of undergraduate distance education programs in Hong Kong and finding the teaching methods and tools implemented by these programs in order to promote better organization and collaboration between the programs, we first investigated the current distance education programs that are available in Hong Kong universities. Then we determined the teaching methods and tools implemented in the courses run by these programs. After gathering all this information we categorized the teaching methods and tools implemented by each of these distance education programs. With this data we have a better idea of what is available in the field of distance education in Hong Kong.

We found the current university level distance education courses offered in Hong Kong. To find the current programs we looked at the universities in Hong Kong. The universities we researched included Hong Kong University of Science and Technology (HKUST), Hong Kong Polytechnic University (HKPU), University of Hong Kong (HKU), Hong Kong Baptist University (HKBU), City University of Hong Kong (CityU), Chinese University of Hong Kong (CUHK), Lingnan University, Hong Kong Institute of Education, and Open University of Hong Kong (OUHK). Within each university we checked for any departments or groups offering or working on distance education courses.

3.1 Objective 1: Current Hong Kong Programs

We determined which distance education programs are currently available in Hong Kong. To gather this data, we conducted research into the universities in Hong Kong and performed interviews with the staff at the schools supporting distance education programs.

3.1.1 Design: Research and Interviews

We identified our target research group consisting of nine universities in Hong Kong. The research was done through the universities' websites and also phone calls to various departments that offer distance education programs.

3.1.2 Data Acquisition

Through online research and contacts through our sponsor, we explored the various universities and identified the programs the schools had to offer. We further investigated these programs by visiting the sites and meeting with the administrators and professors that

run the programs. Many of the administrators and professors were able to give us ample data about the programs or point us in the right direction for more information.

3.1.3 Analysis

With the interview data we collected, we were able to determine what distance education programs are available in Hong Kong. Using this data, we were able to compile a list of the different academic disciplines and different types of courses offered to students in Hong Kong via distance education. These data are explained in more detail in section 4.1 of this report.

3.2 Objective 2: Teaching Methods and Tools Used

We determined the current teaching methods and tools used for distance education in Hong Kong.

3.2.1 Design: Research and Interviews

We used research and interviews much in the same way as stated in section 3.1.1. Our research consisted of finding the administrators and staff of the distance education programs found when we completed our first objective.

3.2.2 Data Acquisition

By investigating the programs discovered when we completed our first objective, we were able to contact the administrators and staff of the distance education programs via both email and telephone. Interviews were conducted both in person and over email roughly following the interview protocol available in Appendix D.

3.2.3 Analysis

Using the interview data collected, we were able to get a better understanding of each program we found in our first objective (section 3.1). Using this data, we were able to understand how the distance education programs in Hong Kong are run. This included both the teaching methods used and the tools the professors and administrators use to get the course content to students and assist with teaching. The data are explained in more detail in section 4.2 of this report.

3.3 Objective 3: Categorizing Current Programs

To accomplish our third objective we categorized the teaching methods and tools used in distance education programs in Hong Kong.

3.3.1 Design: Categorization

We took the information and categorized it. Specific categories were defined to be able to organize all of the data. We were looking for patterns. For example, if several universities used the same course management system or they created their own. Details about the categories will be described in the analysis section.

3.3.2 Data Acquisition

For this objective we used the information gathered in the first and second objectives through the use of interviews and research. The data found about the available distance education programs in Hong Kong and their respective teaching methods and tools was utilized to accomplish this objective.

3.3.3 Analysis

We defined categories and we determined which universities have distance education programs and which do not. We then further defined these programs by determining the teaching methods and tools each of them used. We analyzed topics such as course structure, content presentation, student evaluation, and communication.

4.0 Results and Analysis

After completing our research and data collection, we determined which universities offered distance education programs and which did not. From there, we defined categories into which we sorted the university programs. The university programs were further broken down into different categories depending on the type of program.

4.1 Current Distance Education Programs in Hong Kong

Distance education programs in Hong Kong are currently on the rise. In our research, we found that most universities in Hong Kong have some form of distance education courses as seen in Table 4.1. These programs can range from just a single course to full degree programs. Many of these programs have been created not out of a need to reach students outside the geographical area of the university, but rather to deal with space constraints at universities and allow students to study on their own schedule. Many of the programs that exist were designed to create a very interactive and collaborative learning environment. Table 4.2 lists the distance education programs available next to their sponsoring institution.

University	DE Programs
Hong Kong University of Science and Technology	Yes
Hong Kong Polytechnic University	Yes
University of Hong Kong	Yes
Hong Kong Baptist University	Yes
City University of Hong Kong	Yes
Chinese University of Hong Kong	No
Lingnan University	In Development
Hong Kong Institute of Education	In Development
Open University of Hong Kong	Yes

Table 4.1: Availability of Distance Education Programs

Distance Education Programs	Sponsoring Institution(s)
Hong Kong Virtual University	HKUST, CityU, Lingnan, IEd, HKU
HKUST College of Lifelong Learning	HKUST
Open University of Hong Kong	OUHK
CyberU	HKPU
HKU Space	HKU

Table 4.2: Sponsoring Institutions of Distance Education Programs

4.2 Teaching Methods and Tools used in Hong Kong Distance Education Programs

A very crucial part of modern day distance education is the teaching methods and tools used in the programs. Administrators and professors strive to have students engage and learn the material just as well as, if not better than, in a classroom setting. Using the proper teaching methods is key to creating this educational environment. With the introduction of modern day distance education programs, the personal computer, and the Internet, there are more options and opportunities available for distance education. The tools used to bring the courses to the students and assist them in their learning are a very important part of a distance education program. Many of the institutions we looked into are spending a great amount of time developing tools to use in their distance education programs.

There are many core issues that arise when attempting to run a distance education program. Many of these issues are described in detail in section 2.4 - Limitations of Distance Education. At many universities, these issues are being overcome by creating useful online education tools which engage the students in the subject matter and inspire collaboration, creative thinking, and interactivity. These tools, in combination with good teaching methods, are able to overcome many of the limitations of distance education programs.

Many of the cutting-edge innovations are taking place in the smaller distance education programs that are contained within a university rather than a university-wide program. Programs such as Hong Kong Virtual University and the English language courses at HKUST have developed new tools that overcome previous challenges of online learning. Tools are being developed that create a highly interactive and collaborative learning

environment. In some cases, there are tools in place that allow students to be able to participate much more than in a traditional classroom.

Course management systems are the core component of most distance education programs. Course management systems are defined in section 2.2.2 - Software and Course Management Systems. The basic needs of a CMS are to provide a medium through which students can access course materials and participate in a course. While a course management system can be as simple as a webpage or discussion board, many are very complex and include a multitude of features for learning.

Commercial course management systems have been on the market for almost ten years. Some examples include the very popular WebCT and Blackboard CMS products. They are very robust and include many features. Thousands of institutions currently use commercial CMS products. In talking with many of the administrators of Hong Kong distance education and online learning programs, we have discovered a desire to break away from commercial products. Many of the problems that have been voiced to us are about the common product WebCT. Many administrators feel that the software costs are far too high and it is very difficult to develop a tool that WebCT or Blackboard does not offer. The limited flexibility often can hurt a program. Professors have also voiced their opinions that they find WebCT very difficult to use. There are also staff that enjoy WebCT. As you can tell, there are many mixed opinions and it seems that the choice of what CMS to use is greatly dependent on the program.

Open source or community source CMS products are on the rise. These products are more recently making their way into the mainstream market. Universities are now considering using an open source CMS. One of the major reasons people have told us they look to open source products is their flexibility and cost. With an open source product the only costs are the staff supporting the product. It was very obvious to us that the open source products allowed for much more flexibility. If a feature is not there, a programmer could develop it, whereas in a commercial product that may not be possible. Also, course content can be expanded even more. Course materials can be developed into whatever is required for the course. Administrators, professors, and staff seem to like the flexibility of an open source product.
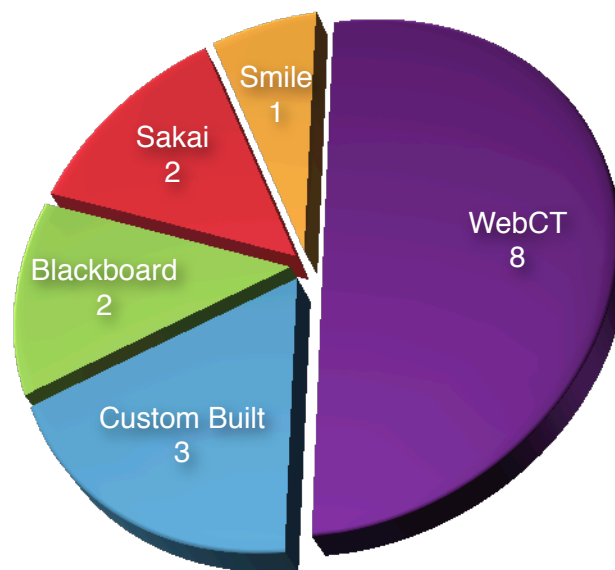
Figure 4.1: Course Management System Use in Hong Kong.

Custom developed products are also on the rise at institutions. Many of the programs in Hong Kong are using a custom (developed in-house) CMS. This is allowing for the maximum flexibility in designing the system around the classes and the institution. These programs are not limited by what is set forth in the CMS, but rather create their program around the teaching they want to promote. Programs such as the English language courses at UST and OpenU have developed their own custom CMS. Other programs such as HKVU are building off a base of an open source platform to custom develop their own CMS. Figure 4.1 shows the course management systems used by the different distance education programs in Hong Kong.

In talking with many of the people behind distance education and online learning in Hong Kong, it appears that anything besides posting basic course materials and providing class discussion is now leading towards custom developed products. Programs are very concerned with the quality of the course and want to make sure that the courses are presented in a way that will create the best learning environment possible.

4.3 Course Framework

The way is which a course is laid out is a very important factor in a distance education program. The framework of a course can mean the difference wither or not a student will learn or succeed in the course. There are three areas we looked at in distance education

programs. These include course structure, content presentation, and student evaluation. Course structure involves how the course is arranged for the students in such areas like due dates or course modules. Content presentation involves how the course material is presented and made available to the student. This can take many different forms from simple video lectures or presentations to interactive games that nurture learning. Student evaluation involves how the students are evaluated for the course. This may involve examinations or possibly just monitoring the progress of students in their work. Figure 4.2 shows a chart of the different categories.
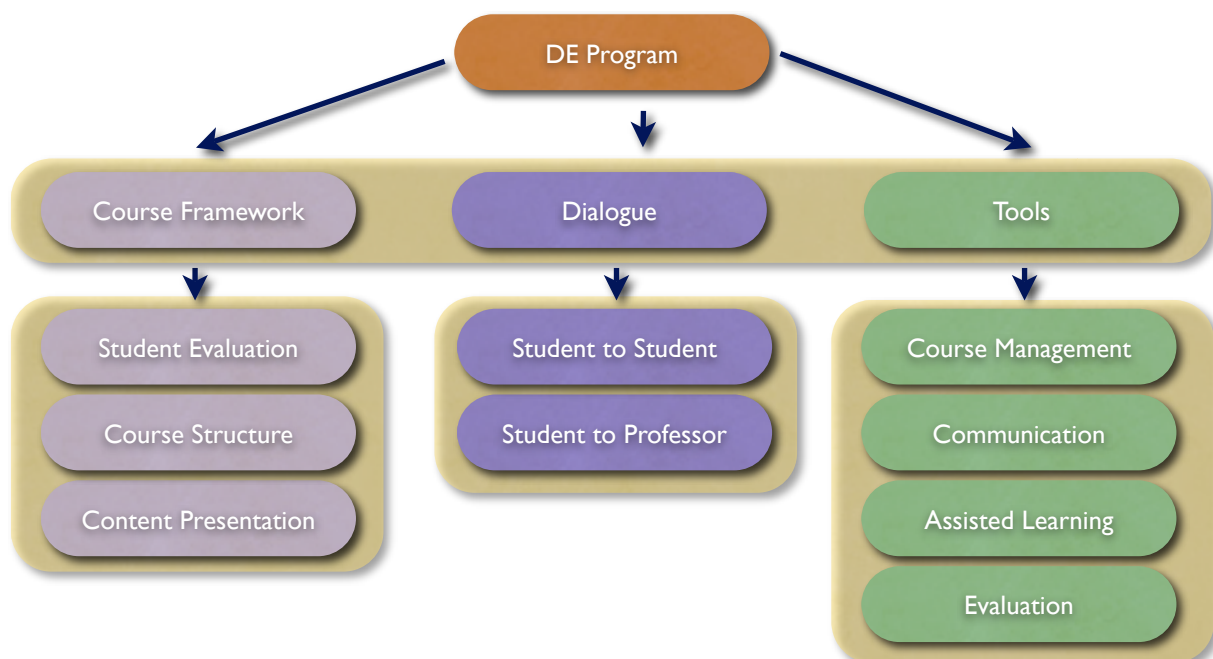

Figure 4.2: Categorization Flow Chart

4.3.1 Course Structure and Content Presentation

For the most part, distance education programs have a defined course structure. The structure provides an organized environment for the students to work in. Some programs use schedules to guide their students. The schedules provide information about assignment due dates and weekly course topics. They keep the students informed in a graphical way as shown in Figure 4.3.
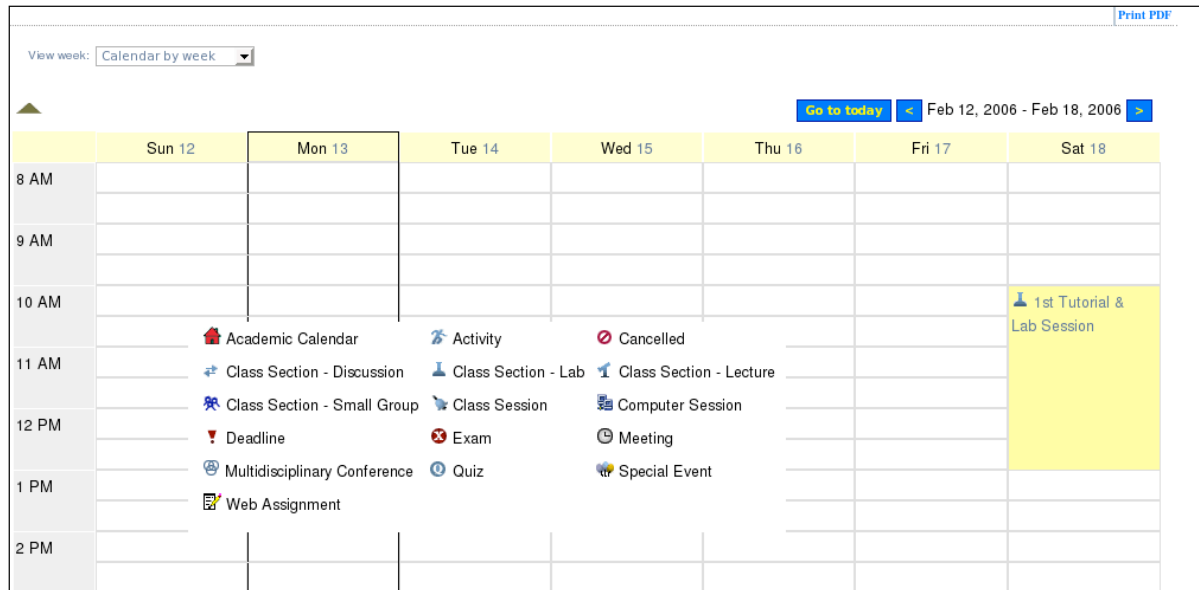
Figure 4.3: Calendar from a course in the HKVU Program

Some of the programs available divide their courses into several sections. These may include video lectures, lecture notes, course materials, lab modules, and assignments. Within each of these sections there can be more sub-divisions. For example, some programs divide all their video lectures by weeks and within each week there are 5 to 20 minute modules. The same division procedure can be applied to other sections such as lecture notes, lab modules, or assignments.

There are many different forms of content presentation. Many of them are based online but others still use physical media. The courses that present content online distribute material through the use of a course management system. Professors have many options to choose from, including video, video synchronized with slides, slides, lecture notes, and interactive exercises. Figure 4.4 shows an example of a lecture with the video synchronized with the slides. There are other courses that complement their online distribution with physical media. For example, professors can distribute their content through audio and video on CD-ROMs, DVDs or VCDs, handouts, and books.

Other programs offer face-to-face tutorials on a timely basis - mostly monthly. In these tutorials, students' questions can be answered by the tutor on duty. Several courses also offer day schools for laboratories, field trips, and guest speakers. One of the programs we researched also offered additional information and parts of courses on public television.

Figure 4.4: Video synchronized with slides in the HKVU Program

4.3.2 Student Evaluation

Traditional forms of student evaluation include graded assignments, quizzes, and examinations. These methods are also being used in the distance education programs that we researched. Professors may send out an assignment which students need to complete. When students finish working on the assignment, they can turn it in through the drop-box in the course management system.

Some professors use quizzes and examinations to evaluate their students online. The student can enter the course management system and answer the quiz or examination questions. Figure 4.5 shows an example of an online quiz. The quiz answers are automatically graded and the results are posted to the gradebook. However, many professors are hesitant to use this method due to cheating concerns. It is very hard to control collaboration between students. Some techniques to try to solve this problem include timed quizzes, question re-arranging, and personal logins. In addition, professors only create online quizzes that do not count as a great percentage of the students grade. They do not feel comfortable putting examinations such as mid-terms or final exams on the course management system.
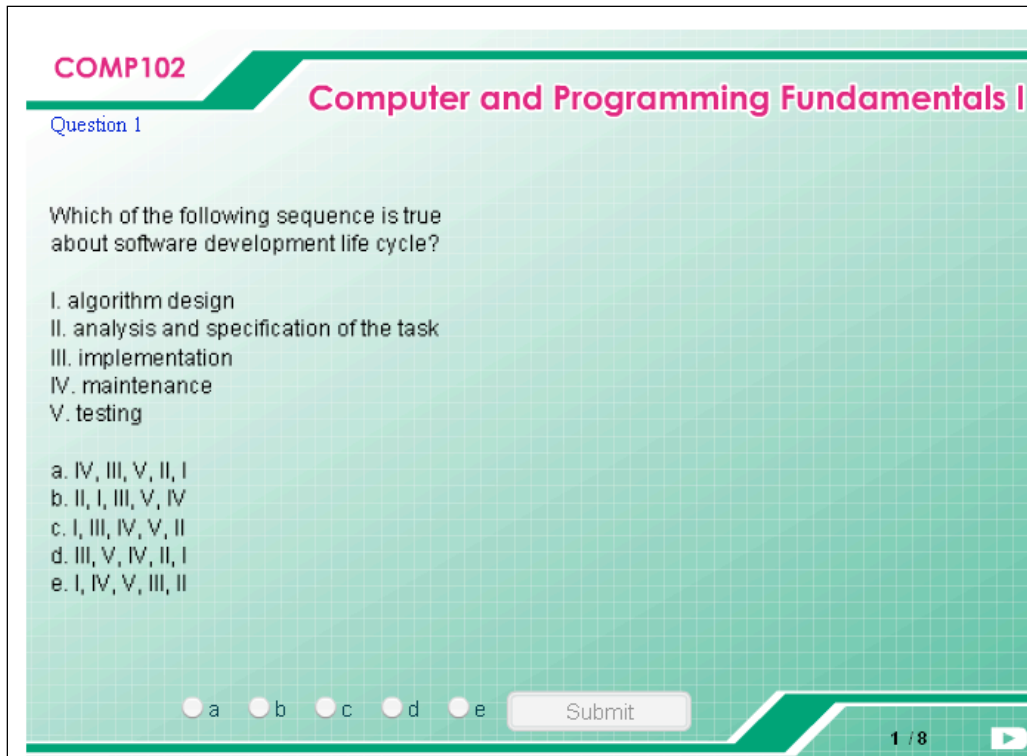
Figure 4.5: Quiz from a course in the HKVU Program

4.4 Dialogue

Another important aspect of the distance education programs we researched is communication. Students need to be able to communicate both with their professors and their fellow students. For this reason, the programs include a combination of tools including discussion boards, chat rooms, video conferencing, and announcements.

In discussion groups, students are able to post questions that professors, teaching assistants, or even other students may answer. This feature is not real-time, users have to login and check the discussion board for new messages. A chat room on the other hand, provides for immediate responses if and only if the professor is online at the same time as the student. When both the student and the professor are online, the tool functions like a text conversation and messages are sent back and forth.

Video conferencing is a more sophisticated communication tool. The users are able to see each other and they may also talk to each other like in a telephone conversation. This tool has some additional software requirements and more Internet bandwidth is needed. Announcements are useful for professors to get in contact with all the students of the course. E-mail lists are also used for this same purpose. Figure 4.6 shows some of the communication

tools of a distance education course. In the figure there is a discussion board, a chat room and video conferencing.
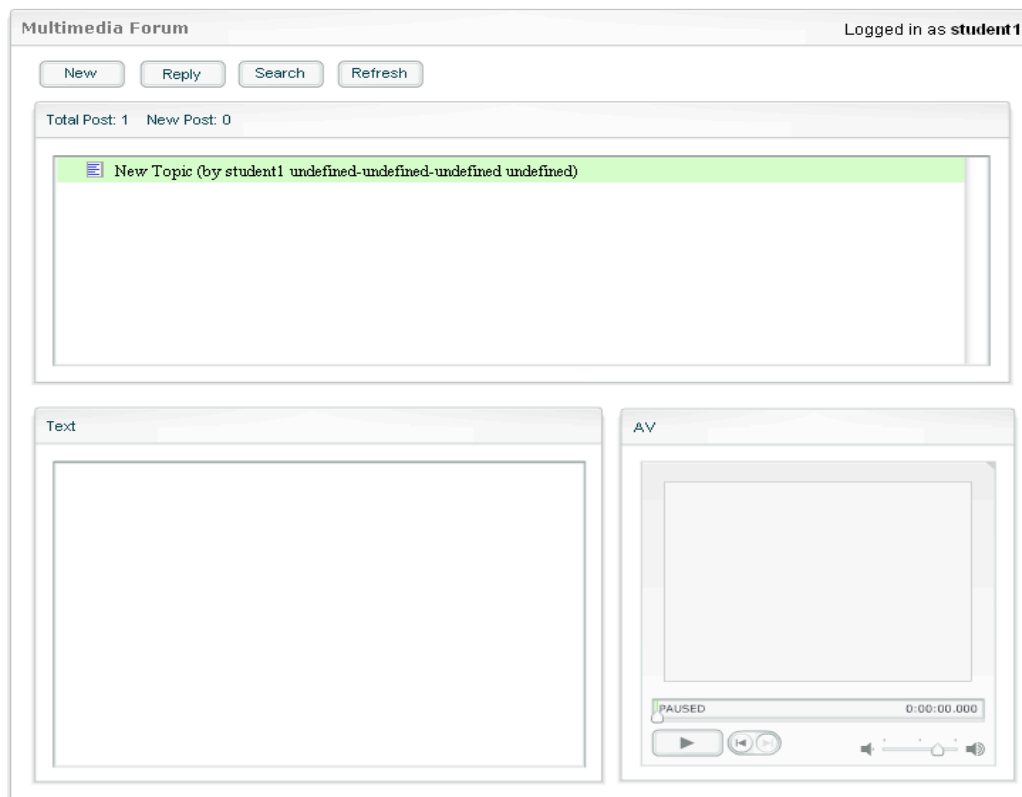
Figure 4.6: Communication tools from a course in the HKVU Program

4.5 Tools

There are various tools currently being used for distance education. They have been developed to complement the course management systems that university programs use. These can range from tools that assist professors with such tasks as grading and correcting assignments, to tools that assist students with communication with one another. Table 4.3 lists the tools we found in our research.

Teaching Tools			
Developer	*Tools*	*Type of Tool*	*Used By*
HKUST David Rossiter	Gong	Communication Language Learning	HKUST HK Secondary Schools
HKUST John Milton	MyWords Check My Words English Grammar Guide Word Neighbors Mark My Words	Grammar Vocabulary Writing	HKUST
HKPU Chris Greaves	Concordancer Active Directory ConcGram QuizMaker XWord Generator MagicMarking Online ClozeMaker Text-to-Speech Dialog Author	Grammar Vocabulary Writing Student Evaluation Practice Exercises	HKPU OUHK

Table 4.3: Teaching Tools in Distance Education Programs

4.5.1 Communication

Communication is an essential aspect of distance education. Professors need input from students to determine if they understand the course materials. Many professors have noticed that students feel more comfortable asking questions online than in a traditional classroom setting. Consequently, professors are developing tools to take advantage of this social characteristic of students.

Many tools for communication are being developed which resemble discussion boards with threaded discussions. The messages are threaded by topic or date, which allow for organization of the discussion board. Some of these programs allow for voice recording. This is very similar to text discussion boards except they contain audio files instead.

Another communication tool that is being used is video conferencing. It provides a visual for students and professors to enhance the interaction. Video conferencing is very useful because it gives professors visual feedback of whether or not students understand the material being taught.

The telephone is another form of communication that some distance education programs use. There are set hours during which students are able to call teaching assistants or professors with any questions they might have.

The final tool that we have seen during our research was an instant messenger program. Students and professors are able to communicate through this program. Students are able to ask questions and then receive answers almost instantly.

4.5.2 Assisted Learning

Assisted learning tools are allowing students to learn in a more interactive and collaborative environment. These tools are developed in a way that allows students to learn topics in the best manner possible. In a language course, students are able to use speech and grammar tools to receive instant feedback on their work. Synchronous voice chats also help facilitate in collaborative learning. More examples of these learning tools can be seen in Table 4.3. While assisted learning tools are not a necessary part of a distance education program, it appears that they contribute to creating a more enhanced learning environment.

4.5.3 Feedback and Grading

Tools have been designed to better enable teachers to provide their students with feedback on their progress in distance education courses. Among these tools are tools to help teachers comment on students' written assignments, giving feedback to help students improve their writing in the future, as well as tools to allow teachers to give students verbal feedback on their language skills.

4.5.4 Evaluation

Numerous tools have been developed to assist teachers in the development of tests, quizzes, and other materials with which to evaluate students. Tools have been developed to create crossword puzzles, fill in the blank exercises with audio, multiple choice quizzes, and many other types of tests. Some of these tools were created with the intent of the results from their tests being used in determining the grade to be received by students, while others were intended to enable students to test their own comprehension of the subject matter with no impact on their grades.

5.0 Conclusion

After researching nine Hong Kong universities, we discovered that six of them had distance education programs and tools available for undergraduate studies. Most distance education programs created by professors are on a small scale rather than a full-degree program. Areas covered by the distance education programs include languages, basic sciences, marketing, and management.

Most of the universities use commercialized course management systems such as Blackboard or WebCT. However, many professors believe that these systems are very constricting and do not allow for easy development of add-ons to meet their needs. Accordingly, some of the professors choose to create their own systems to give them the flexibility that they desire. These course management systems are developed for specific needs of professors and used exclusively for the classes they teach. Since these systems are developed on a small scale, not many people know about them. In fact, professors within the same university sometimes do not know what each other are doing in terms of distance education. Occasionally there are multiple course management systems developed within the same university. This is due to the fact that programs are developed by departments within the university rather than by the university as a whole. It seems as if the departments are "re-inventing the wheel" in terms of creating course management systems and tools that have already been developed.

Professors at Hong Kong universities have been able to develop these tools due to the structure of the Hong Kong educational system. Through new educational initiatives, the Hong Kong government provides funding to public schools and universities to develop their educational programs. Although such funding is beneficial, it also leads to a lack of collaboration between universities that develop these tools. The funding provided by the new initiatives gives many of the Hong Kong universities the ability to develop new software programs and tools by themselves.

Many Hong Kong universities are also using online tools to supplement their current in-class teaching. In our research we found that nearly all Hong Kong universities are using some form of a course management system for their courses on campus. This provides students in a traditional classroom setting with the advantages of an online learning

environment. The majority of these tools allow for much of the course content to be readily accessible to the students without time or location limitations. More collaboration and participation in classes is encouraged through online chats and discussions since many professors notice that students feel more comfortable participating online than in a traditional classroom setting. Through our research, we found that many students really embrace these features. Bringing these online tools into current traditional courses is allowing the courses to go beyond the doors of the classroom.

Educational technology is progressing at a very fast pace. The future of Hong Kong undergraduate university education appears to be moving towards a blended learning environment. This type of learning combines the "best of both worlds" - the traditional classroom setting and the distance education model. This is possible because Hong Kong is a city with excellent public transportation. Thus, most students can easily attend class. Some professors believe that face-to-face instruction cannot be replaced. However, the advances in online teaching are enhancing previous teaching methods and reducing the impact of time constraints for students and professors. Distance education appears to inspire new ideas in education and allow people to think "outside the box".

Glossary

BlackBoard

An online course management system that allows professors to post grades, information, and assignments. They can also hold discussions and you can turn in assignments through Blackboard.
www.marymount.edu/parents/glossary.html

blended learning

An educational formation that integrates e-learning techniques including online delivery of materials through web pages, discussion boards and/or email with traditional teaching methods including lectures, in-person discussions, seminars, or tutorials.
www.teach-nology.com/glossary/terms/b/

Course Management System (CMS)

Often Internet-based, software allowing instructors to manage course material distribution, assignments, communications and other aspects of instruction for their courses.
alt.uno.edu/glossary.html

discussion boards

Forums, on the Internet or an intranet, where users can post messages for other users to read and respond to.
www.itslifejimbutnotasweknowit.org.uk/lt_glossary.htm

discussion groups (also newsgroups, bulletin boards)

Discussion groups work in a similar way to electronic mail. Instead of writing messages to individual users, participants in discussion groups post their messages on a news server. The messages are stored on the news server in hierarchical directories. Users participate in discussion groups by reading the messages and responding to them.
www.walsalleducation.org/wegfl/about_grid/content_help/faq.cfm

distance education (also distance learning, online learning, e-learning)

A formal learning activity which occurs when students and instructor are separated by geographic distance or by time, often supported by communications technology such as television, videotape, computers, email, mail, or interactive videoconferencing.
www.netnet.org/students/student%20glossary.htm

dropbox

A location where assignments are supposed to be submitted by students.

e-mail lists

An email list is a central email address that forwards messages to the other addresses specified in a list. Email lists are run by a program on a server called a list server. Lists can be set up by registering the list, and its members, with the list server program. The program then organizes the transfer of messages from the list's email address to all the members of the list.
www.fraw.org.uk/library/005/gn-irt/glossary.html

Information Technology (IT)

A term that encompasses all forms of technology used to create, store, exchange and utilize information in its various forms including business data, conversations, still images, motion pictures and multimedia presentations.
www.sciencecoalition.org/glossary/glossary_main.htm

instructional design

Instructional design is the analysis of learning needs and the systematic development of instruction to meet those needs.
en.wikipedia.org/wiki/Instructional_design

internet telephony

Internet telephony is the use of the Internet rather than the traditional telephone company infrastructure to exchange spoken or other telephone information.
www.creotec.com/index.php

open source (also community source)

In general, open source refers to any program whose source code is made available for use or modification as users or other developers see fit. Open source software is usually developed as a public collaboration and made freely available.
home.comcast.net/~mtsonata/FinalProject/glossary.html

pedagogy

The art, science, or profession of teaching.
www.m-w.com

plant operations

Anything required to keep a large building or set of buildings running. This may include, but is not limited to: construction, development planning, mechanical systems, electrical systems, grounds keeping, building management, heating, cooling, security, electrical, repairs and maintenance, locksmith services, and cleaning services. Basically anything required to make things run physically in a small city atmosphere.

Sakai

A course management system developed as part of the Sakai Project, which develops open-source educational software.

Smile

An e-learning platform developed by Hong Kong Polytechnic University, similar in function to WebCT.

web portal

A web portal is a web site that provides a starting point, a gateway, or portal, to other resources on the Internet or an intranet.
en.wikipedia.org/wiki/Web_portal

social presence

The feeling that the people with whom one is collaborating are in the same room.
www.hkkk.fi/~tammelin/MEP8.tammelin.html

streaming video

A sequence of "moving images" that are sent in compressed form over the Internet and displayed by the viewer as they arrive. With streaming video, a web user does not have to wait to download a large file before seeing the video or hearing the sound. Instead, the media is sent in a continuous stream and is played as it arrives.
www.cesa8.k12.wi.us/media/digital_dictionary.htm

video conferencing

Communication in real time with two or more people at different locations using both visual and audio media.
www.bu.edu/webcentral/learning/av/glossary.html

virtual classrooms

An online learning environment.

WebCT

WebCT [Web Course Tools] is a web-based course management system that allows faculty to create web sites for courses that enhance or deliver course instruction. Students enrolled in courses supported with WebCT have access to support materials posted by the instructor. These may include: syllabi, assignments, links to Web-based materials, discussion boards, chat rooms, online quizzes.
www.lssu.edu/admissions/lakerterms.php

References

Allen I. & Seaman J. (2005). Growing by Degrees. Retrieved November 28, 2005, from http://www.aln.org/resources/survey.asp

Arnone, M. (2002). Mixing and Matching Distance-Education Software. The Chronicle of Higher Education, Information Technology, A33.

Australian Trade Commission. (2005). Education to Hong Kong - Exporting online – For Australian Exporters - Export assistance, grants, and help. - Australian Trade Commission. Retrieved November 21, 2005, from: http://www.austrade.gov.au/australia/layout/0,,0_S2-1_CLNTXID0019-2_-3_PWB199795-4_exportonline-5_-6_-7_,00.html

Baker, C., personal communication, February 8, 2006

Barnes, R., & Lawton, S. (1998). Developing distance learning courses in a traditional university. Quality Assurance in Education, (6)2, 106-111.

Barnett, J. R., personal communication, November 18, 2005

Beesley, A. D., & Cavins, D. L. (2002). Marketing Distance Learning with an Ad Agency. Retrieved December 4, 2005, from the University of West Georgia Web site: http://www.westga.edu/~distance/ojdla/summer52/beesley_cavins52.html

Berger, C. (1996). Definitions of Instructional Design. Retrieved December 11, 2005, from the University of Michigan Web site: http://www.umich.edu/~ed626/define.html

British Council. (2005). Market background - 11th China International Education Exhibition Tour (Spring 2006) with Education UK, China, 18 February to 5 March 2006 - Education UK Marketing - British Council. Retrieved November 20, 2005, from http://educationuk.britishcouncil.org/events/2006/0207/details/market.htm

Carnevale, D. (2000). Turning Traditional Courses Into Distance Education. Retrieved December 11, 2005, from http://chronicle.com/free/v46/i48/48a03701.htm

Center for Studies in Higher Education (2001). Costs, Culture and Complexity: An Analysis of Technology Enhancements in a Large Lecture Course at UC Berkeley. Retrieved January 17, 2006, from: http://cshe.berkeley.edu/projects/university/chem1a/summary.html

Cheng, Kai-ming. Quenching the Thirst: Meeting the Demand for Post-Secondary Education in Asia. Retrieved January 24, 2006, from: http://www.oecd.org/dataoecd/37/22/2750725.pdf

China Population Information and Research Center (CPIRC). (2005). Guangdong Province. Retrieved November 20, 2005, from http://www.cpirc.org.cn/en/30Province1999-guangdong.htm

Chinese University of Hong Kong ITSC, personal communication, February 10, 2006

Duvall, C. K., & Schwartz, R. G. (2000). Distance education: relationship between academic performance and technology-adept adult students. Education and Information Technologies, 5(3), 177-187.

"Education in Hong Kong." Wikipedia. Wikipedia, 2005. 24 Jan 2006. http://en.wikipedia.org/wiki/Education_in_Hong_Kong

Greaves, C., personal communication, January 27, 2006

Guangdong Academy of Social Sciences. (2003). The Status of Guangdong Higher Education. Retrieved November 20, 2005, from the Guangdong University of Foreign Studies Web site: http://english.gdufs.edu.cn/Article_Show.asp?ArticleID=183

The Hong Kong Council for Academic Accreditation (2005). List of Post-Seconday Programmes Accredited by the HKCAA. Retrieved January 17, 2006, from: http://www.hkcaa.edu.hk/Forms/List%20of%20Post%20Secondary%20Programmes.htm

Hong Kong CyberU Limited. (2004). Hong Kong CyberU. Retrieved December 4, 2005, from the Hong Kong CyberU Web site: http://www.hkcyberu.com/main/main.htm

Hong Kong University SPACE (2003). Programmes and Courses. Retrieved January 17, 2006, from: http://hkuspace.hku.hk/web_course/course_cat.php?parent_seq=1&content=eng

Hui, W., personal communication, January 25, 2006

Ivankova, N. V., & Stick, S. L. (2005). Collegiality and Community – Building as a Means for Sustaining Student Persistence in the Computer – Mediated Asynchronous Learning Environment. Online Journal of Distance Learning Administration, Vol 8, Num 3.

Lee, C., personal communication, January 27, 2006

Leeuwe, M.D. (2005) E-learning Basics Synchronous. Retrieved December 4, 2005, from http://www.e-learningsite.com/elearning/character/synchr.htm

Lemone, K., personal communication, November 28, 2005

Matthews H., & Meador D., & Fink W. (2006). Chemistry 2C Laboratory Presentations. Retrieved January 17, 2006, from: http://chemelements.ucdavis.edu/CHE2C/Fall2005/Login/Login.cfm

Meador D., & Fink W., & Wilson L. (2003). Web-based Pre- & Post-Laboratory Activities for General Chemistry. Retrieved January 17, 2006, from: http://www.educause.edu/ir/library/powerpoint/EDU0331.pps

Milton, J., personal communication, January 26, 2006

Mohrman, K. (2003). Higher Education Reform in Mainland Chinese Universities: An American's perspective. Retrieved December 4, 2005, from the Chinese University of Hong Kong Web site: http://www.cuhk.edu.hk/hkac/thematic/innovation/resource/prc/kat_art/p06.htm

Moore, M. (2005). Cheating. The American Journal of Distance Education, 19(1), 1-3.

Moore, M. (2003). Handbook of Distance Education. Mahwah, NJ: Lawrence Erlbaum Associates, Inc.

Moore, M. (1972). Learner autonomy: The second dimension of independent learning. Convergence 5 (2): 76–88.

Newman, M. (1996). Courses at Your Convenience. New York Times, P. EL13.

Open University of Hong Kong (2004). Graphs, Networks and Design. Retrieved January 17, 2006, from:http://www.ouhk.edu.hk/WCM/?FUELAP_TEMPLATENAME=tcTocMain&BODY=tcTocMain&FUELAP_SITEDBID=SITE_-65&DATA_ONLY=true&TYPE=CI&CODE=MT365&LANG=eng

Pace University. (2000). Proctoring. Retrieved December 1, 2005, from http://support.csis.pace.edu/nactel/gotoclass/proctoring.cfm

Pong, T. C., personal communication, February 8, 2006

Rong, Y., personal communication, December 7, 2005

Rossiter, D., personal communication, January 25, 2006

sakaiproject.org (2006). About Sakai. Retrieved February 2, 2006, from http://sakaiproject.org/index.php?option=com_content&task=view&id=103&Itemid=208

Shaik, N. (2005). Marketing Distance Learning Programs and Courses: A Relationship Marketing Strategy. Retrieved December 11, 2005, from the University of West Georgia, Distance Education Center Web site: http://www.westga.edu/~distance/ojdla/summer82/shaik82.htm

Sharman, R., personal communication, January 27, 2006

Shive, Glenn. (2003). Hong Kong's New Post-Secondary Education Marketplace. Retrieved January 24, 2006, from: http://www.iiehongkong.org/fair/ADdayarticle.htm

Stemer, R. (1995, January 8). The Virtual Classroom: Colleges face tough questions about using technology to teach more students. Can video lectures and E-mail offer the give-and-take of real learning?. New York Times, p. EL39.

Tu, C., & McIsaac, M. (2002). The Relationship of Social Presence and Interaction in Online Classes. The American Journal of Distance Education. 16(3), 131-151.

Turgeon, P. S., personal communication, November 22, 2005

United Nations Economic and Social Commission for Asia and the Pacific. (2005). Guangdong. Retrieved November 20, 2005, from http://www.unescap.org/esid/psis/population/database/chinadata/guangdong.htm

United States Distance Learning Association (2006). Distance Learning Link Program (DLLP). Retrieved January 17, 2006, from: http://www.usdla.org/html/resources/dllp/cr.htm

University of Hong Kong, Wah Ching Centre of Research on Education in China (CREC). (2005). CREC:China Education News Archive: Higher education. Retrieved November 21, 2005, from the University of Hong Kong, Wah Ching Centre of Research on Education in China (CREC) Web site: http://www.hku.hk/chinaed/chinaed_news/chinaednews_index_highered.htm

University of Phoenix. (2005). About Us. Retrieved November 16, 2005, from http://www.phoenix.edu/about_us/media_relations/online_education/

Williams, M., Paprock K., & Covington, B. (1999). Distance Learning – The Essential Guide. Thousand Oaks, CA: Sage Publications Inc.

Willis, B. (1994). Distance Education: strategies and tools. Englewood Cliffs, NJ: Educational Technology Publications.

WPI - Advanced Distance Learning Network. (2005). Distance Education at WPI. Retrieved November 19, 2005, from http://www.wpi.edu/Academics/ADLN/About/

Yeronga Institute of TAFE (2004). Glossary I. Retrieved December 4, 2005, from the Yeronga Institute of TAFE Web site: http://www.yeronga.tafe.qld.gov.au/tools/glossary/glossary_i.shtml

Yuen, K. S., personal communication, February 7, 2006

Zhang, A. (2003). Transactional distance in web-based college learning environments: Toward measurement and theory construction. Doctoral dissertation, Virginia Commonwealth University.

Zirkle, C. (2002). Identification of Distance Education Barriers for Trade and Industrial Teacher Education. Retrieved December 11, 2005, from the Virginia Tech Web site: http://scholar.lib.vt.edu/ejournals/JITE/v40n1/zirkle.html

Appendices

Appendix A: Sponsor Description

The Hong Kong University of Science and Technology

Clear Water Bay, Kowloon, Hong Kong

Telephone: (852) 2358 6000

Website: http://www.ust.hk/

Motto: Hands on the Present and Eyes for the Future.

Vision: To be a leading university with significant international impact and strong local commitment.

Global: To be a world-class university at the cutting edge internationally in all targeted fields of pursuit.

National: To contribute to the economic and social development of the nation as a leading university in China.

Local: To play a key role, in partnership with government, business, and industry, in the development of Hong Kong as a knowledge-based society.

Mission: To advance learning and knowledge through teaching and research, particularly in science, technology, engineering, management and business studies; and at the postgraduate level; and to assist in the economic and social development of Hong Kong.

Objectives:

Students: To give all students, undergraduate and postgraduate alike, a broadly based university experience that includes: superior training in their chosen fields of study; a well-rounded education that enhances the development of their creativity, critical thinking, global outlook, and cultural awareness; a campus life that prepares them to be community leaders and lifelong learners.

Faculty and Staff: To provide a dynamic and supportive working environment in which faculty and staff may continually develop intellectually and professionally.

Research: To be a leading institution for research and postgraduate study, pursuing knowledge in both fundamental and applied areas, and collaborating closely with business and industry in promoting technological innovation and economic development.

Campus Culture: To provide an open environment and atmosphere conducive to the exchange of knowledge, views, and innovative ideas among students, faculty, staff, and visiting scholars.

Commitment to Hong Kong: To promote and assist in Hong Kong's economic and social development, and to enrich Hong Kong's culture.

What kind of organization is this?

Hong Kong University of Science & Technology (HKUST) is a private organization. As of January 2005, there were 5,519 undergraduate students and 2,994 postgraduate students attending HKUST. HKUST offers a wide variety of courses that teach students valuable information that can be used to work with the public and private sectors.

Structure of the organization:

As of January 2005, the University has 403 regular faculty members, as well as 36 visiting faculty members.

The Council

The Council is the governing and executive body of the University. Established under the HKUST Ordinance, the Council has 29 members, comprising the President, Vice-Presidents, and Deans as ex-officio members, academic members nominated by the Senate, and 18 lay members from the business, financial and industrial sectors.

The Court

The University Court was established in May 1994 as the supreme advisory body to Council on matters of direction, with a view to promoting the well-being of the University and raising funds. Headed by the Court Chairman, the University Court consists of eight ex-officio members and up to 44 appointed lay members.

The Senate

The Senate co-ordinates the academic planning and development of the University. Under the Senate are the Boards of Schools (Science, Engineering, Business & Management, and Humanities & Social Science), each of which establishes its own committees to oversee major academic policy areas, including academic planning and resources, quality assurance, academic regulations, ethics, learning and teaching developments, research, appeals and provision of various academic support services.

Academic Structure

The University has 4 Schools: Science, Engineering, Business and Management, and Humanities and Social Science.

All material courtesy of: Hong Kong University of Science and Technology. (2004). Hong Kong UST. Retrieved December 4, 2005, from the Hong Kong UST Web site http://www.ust.hk/

Appendix B: Interactive Qualifying Project Information

What is an IQP?

The Interactive Qualifying Project (IQP) is one of the building blocks of the WPI Plan. It looks at connections between technology and society. This project also tries to satisfy two of the three major goals of the WPI Plan. First, it promotes learning by making students carry out a project. It also gives students flexibility when choosing their own educational program design.

How does our project qualify as an IQP?

The project, *A Study of Distance Education at Hong Kong Universities*, addresses the needs of students within Hong Kong and beyond who are trying to access university-level educational programs. The solution that it explores is distance education. This technology has the ability of bringing the knowledge to the people who need it, regardless of where they may be. The tools used in distance education are also becoming very important in distance education programs and traditional classroom programs.

Appendix C: History of Distance Education

Distance education started in the 1880's. As Williams (1999) explains, this first type of distance learning is named passive distance learning because the student has no efficient or fast way of interacting with the teacher. Typically, there is a one-way transmission of messages and responses, but it is extremely slow. Means of communication for this type include printed materials, radio transmissions and tapes both for video and audio.

The second level of distance learning is considered to be passive to moderately active (Williams, 1999). This type of distance learning developed in the 1960's and continued for approximately 30 years. Williams calls this level synchronous because messages can be sent at the same time between the student and the teacher and there is immediate feedback. This level consists mainly of two-way audio tele-training with one-way or two-way video transmission, computer-based training disks, CD-ROMs, laser disks, personal computer tele-training via bulletin boards, electronic mail, computer-mediated conferencing and audio-graphics. The most recent distance learning level is called highly interactive. It started to develop in the 1990's and is continually evolving. As Williams explains:

> In these environments, there is no one primary mode of delivery. Instead, the elements of the course being taught determine which technologies will be the "primary" or "instructional" form of delivery and which will be the "secondary" or "support" form of delivery. (p. 5)

This level of distance learning is a combination of all the other capabilities of the previous levels fused into one electronic classroom. Currently this level of distance education has coupled tightly with the Internet and new technologies. Courses taught in the Advanced Distance Learning Network at Worcester Polytechnic Institute stream video of the classes taught by the professors through the Internet (WPI, 2005). Furthermore, professors such as Barnett use instant messaging clients to communicate with their students and final exams are carried out as video conferences (Barnett, 2005).

Appendix D: Interview Protocols for Students and Staff in DE

Professors Draft Interview Protocol:

What are the methods of teaching that you utilize in your distance learning courses to present the content of the course to your students?

How do you communicate with your students?

How do you evaluate your students?

Do you have concerns about cheating in your courses? How have you handled this?

What is there any other tools or methods not available to you that you feel could help you teach distance education courses more effectively?

What do you find to be different between distance learning and traditional courses?

How much time does it take for you to prepare for a distance education course?

Administrators Draft Interview Protocol:

What are the technologies used to support the distance education programs that your institution offers?

How were these technologies chosen? Was there a try-out period for other technologies?

Do you use a course management system?

What are the costs of offering this distance education program?

Are there any hardware or software requirements for the students?

Appendix E: List of Persons Interviewed

Christopher Baker (Patrick)
English Course Designer
Open University of Hong Kong
30 Good Shepherd Street, Rm. A0614
Ho Man Tin, Kowloon, Hong Kong
Email: cbaker@ouhk.edu.hk
Phone: (852) 2768 6424

Jonathan R. Barnett
Professor of Fire Protection Engineering
Fire Protection Engineering & Center for Firesafety Studies
Worcester Polytechnic Institute
100 Institute Road
Worcester, MA 01609 USA
Email: jbarnett@wpi.edu
Phone: 508-831-5113

ITSC
Chinese University of Hong Kong
Pi Ch'iu Building, Rm. 218
Sha Tin, N.T., Hong Kong
Email: christina@itsc.cuhk.edu.hk
Phone: (852) 2609-8861

Christopher Greaves
English Department
Hong Kong Polytechnic University
Hung Hom, Kowloon, Hong Kong
Email: ecchgr@yahoo.com

Winnie Hui
Hong Kong University of Science and Technology
Hong Kong Virtual University - Rm. 2131
Clear Water Bay Road, Kowloon, Hong Kong
Email: hwcw@ust.hk

Carmen Lee
Center for Enhanced Learning
Hong Kong University of Science and Technology
Clear Water Bay Road, Kowloon, Hong Kong
Email: ctcarmen@ust.hk

John Milton
Director of English Language Courses
Hong Kong University of Science and Technology
Clear Water Bay Road, Kowloon, Hong Kong
Email: lcjohn@ust.hk
Phone: (852) 2358 7849

Karen A. Lemone
Computer Science Department
Worcester Polytechnic Institute
100 Institute Road
Worcester, MA 01609 USA
Email: kal@cs.wpi.edu
Office: Fuller Labs 133
Phone: 508-831-5529

T C Pong
Associate Vice-President for Academic Affairs
Hong Kong University of Science and Technology - Rm. 6331
Clear Water Bay Road, Kowloon, Hong Kong

Yiming (Kevin) Rong
Mechanical Engineering Department
Worcester Polytechnic Institute
100 Institute Road
Worcester, MA 01609 USA
Email: rong@wpi.edu
Office: Washburn Labs 307
Phone: 508-831-6020

David Rossiter
Department of Computer Science
Hong Kong University of Science and Technology
Clear Water Bay Road, Kowloon, Hong Kong
Email: rossiter@ust.hk

Rex Sharman
English Course Designer
Open University of Hong Kong
30 Good Shepherd Street, Rm. A0614
Ho Man Tin, Kowloon, Hong Kong
Email: rsharman@ouhk.edu.hk
Phone: (852) 2768 6437

Pennie S. Turgeon
Director of ATC and ADLN
Academic Technology Center
Worcester Polytechnic Institute
100 Institute Road
Worcester, MA 01609 USA
Emai: pennie@wpi.edu
Office: Fuller Labs 117
Phone: 508-831-5220

Kin Sun Yuen
Education Technology and Publishing Unit
Open University of Hong Kong
30 Good Shepherd Street, Rm. A0616
Ho Man Tin, Kowloon, Hong Kong
Email: ksyuen@ouhk.edu.hk
Phone: (852) 2768 6400

Appendix F: ADLN Program at Worcester Polytechnic Institute

The Advanced Distance Learning Network program at Worcester Polytechnic Institute started more than twenty years ago (WPI, 2005). It is designed specifically for graduate students around the globe. The program offers courses in Management, Fire Protection Engineering, Civil Engineering and System Dynamics. Web, videotape and video conferencing are among the technologies that this program utilizes. Furthermore, the student-professor communication is enhanced through e-mail, fax, telephone, virtual chat and discussion boards.

All the ADLN programs are taught by the same faculty members that teach the on-campus courses (WPI, 2005). Since Worcester Polytechnic Institute believes that distance programs need to be structured in a different way than on-campus programs, faculty members work with instructional design teams to make sure that distance learners get the same educational quality as on-campus learners.

Students are not able to apply directly for a distance learning program (WPI, 2005). They first need to be admitted to Worcester Polytechnic Institute. Then students decide which courses need to be taken at a distance. Distance and on-campus courses can be combined to obtain a degree, but there are also entire programs which can be completed online. Worcester Polytechnic Institute assures that distance learning students get the same high quality class content, same materials, same dedicated faculty and same diploma as on-campus students. The only difference is the omission of the residency requirements.

Through the use of a learning management system, a consistent framework for distance courses is provided both for faculty and students (WPI, 2005). Most of the distance learning courses have a combination of delivery methods. Using asynchronous delivery methods, Worcester Polytechnic Institute addresses the needs of busy professionals by utilizing single direction communication techniques. With this delivery method, students view the course materials at their own convenience with no specific times defined for access. Deadlines are specified for assignments and projects. Synchronous delivery methods are utilized occasionally by faculty members. These methods use two-way communication techniques to connect professors with their students. Examples of these delivery methods include chat and online whiteboards. These methods try to enhance the material in a course. One important aspect of all the distance courses is the learning management system. It is referred to as

"MyWPI". This system gives access to course content and collaboration tools through a friendly user interface. The main goal of this system is to enhance the interaction between students and faculty members.

Worcester Polytechnic Institute houses an instructional design team that develops various combinations of media designed to deliver courses to students around the globe (WPI, 2005). The online component is the Internet component of the course. Several distance courses only use the Internet to deliver their course content. In addition, the Internet is used to access the central learning management system. From this system, faculty members manage the class communications, make announcements and deliver the course content. Other courses use video as the method for delivering course material. Faculty members are recorded in a TV-studio in the Worcester campus. These videos are then made available through the Internet in an archived stream. For students who do not have the necessary bandwidth to view the videos, a copy can be shipped to them for an additional fee. Another option is to offer fully interactive videoconference sessions. A state-of-the-art video conferencing system is used to communicate with other sites with compatible video conferencing equipment.

Certain courses have requirements to be able to access course material (WPI, 2005). Some courses require a VHS or VCR, Video DVD Playback Capability, DVD-ROM drives or High-Speed Internet Access. There are also minimum hardware and software requirements that need to be met. These include Microsoft Windows XP, Windows Media Player 9.0, Internet Explorer and Pentium II Processors.

Of all students enrolled in the Advanced Distance Learning program at Worcester Polytechnic Institute, 98% attend on a part-time basis (WPI, 2005). As Figure 2.6.1 indicates, even though WPI has a distance education program, most students come from Eastern United States, near the physical location of the university. International students make up another important group in the ADLN program at WPI. Figure 2.6.2 shows that more than half of the students enrolled in the program have ages between 21 and 34. Turgeon states that most students are active professionals with technical undergraduate backgrounds (Turgeon, 2005).

Figure F.1: Geographic Distribution of Students (WPI, 2005)

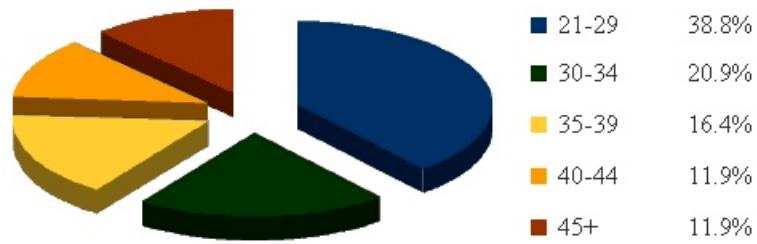|	
East	68.4%
South	6.2%
Central	6.2%
West	5.1%
International	14.1%

Figure F.2: Student Age (WPI, 2005)

21-29	38.8%
30-34	20.9%
35-39	16.4%
40-44	11.9%
45+	11.9%