

New Challenges in e-Commerce Education – A Cyber University Experience

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Abstract

In this paper we present the new challenges in developing and delivering a masters programme in e-Commerce through the web. The Web-based environment being used for course delivery also supports teaching materials and on-line tutorials for interaction among lecturers and students. The courseware is designed to provide students with an on-line interactive learning experience. After the courses have been delivered, we formally evaluated the examination results of the students studying through the Web-based course and concluded that the learning effectiveness of the students is the same as those offered in conventional mode. Thus, our web-based approach is a successful example of an e-learning programme that is delivered solely through the Internet. It is expected that more subjects can be delivered through the Web in future.

1. Introduction

The department of Computing of the Hong Kong Polytechnic University (HKPolyU) offers a Web-based masters degree course in e-Commerce through the HKCyberU. The HKCyberU is a joint venture between the Hong Kong Polytechnic University and the Pacific Century CyberWorks IMS, the Interactive Multimedia Service Company (PCCW). The HKCyberU is established in June 2000 to deliver academic programmes at masters level that leads to HKPolyU awards. Students enrolled on the course can study through the Web without the need to go for face-to-face classroom lectures. Through the Web-based courseware developed, students can pursue their MSc in e-Commerce studies through the Web. It also gives students more flexibility to study anytime and anywhere at their own pace. We integrate PolyU's expertise in research, consulting and pedagogical development with PCCW's telecom and broadband capabilities to create the first Hong Kong-based cyber university. The programme is designed for students in

Hong Kong, Mainland China, the South East Asian region and other parts of the world.

2. The MSc in e-Commerce Programme

We started the development of a M.Sc. programme in e-Commerce in 1999 [2]. The course was successfully validated through the validation panel of the Hong Kong Polytechnic University in May 2000. The Programme aims at education and training of a new generation of knowledge and technical workers who will be able to effectively contribute towards the planning, development, deployment, and management of electronic commerce systems and applications. The objectives of the M.Sc. in e-Commerce programme are as follows :-

- A good understanding of e-Commerce fundamentals
- A sound knowledge of business models, information systems and technologies in relation to e-Commerce
- The ability to appraise tools like e-Commerce platforms, HTTP servers, secure transaction software and firewalls, database systems, heterogeneous networks, intelligent agent, etc
- The ability to construct a variety of e-Commerce systems for trading products and services, and managing vendor relations

A HKCyberU version of the programme was developed in parallel. The four subjects for the HKCyberU version of the M.Sc. programme were delivered last year during the first and second semesters. As these subjects are to delivered in a remote learning mode, the Internet is used as the medium for delivery of course materials, for communicating among lecturers and students, and to provide an interactive learning environment for the HKCyberU.

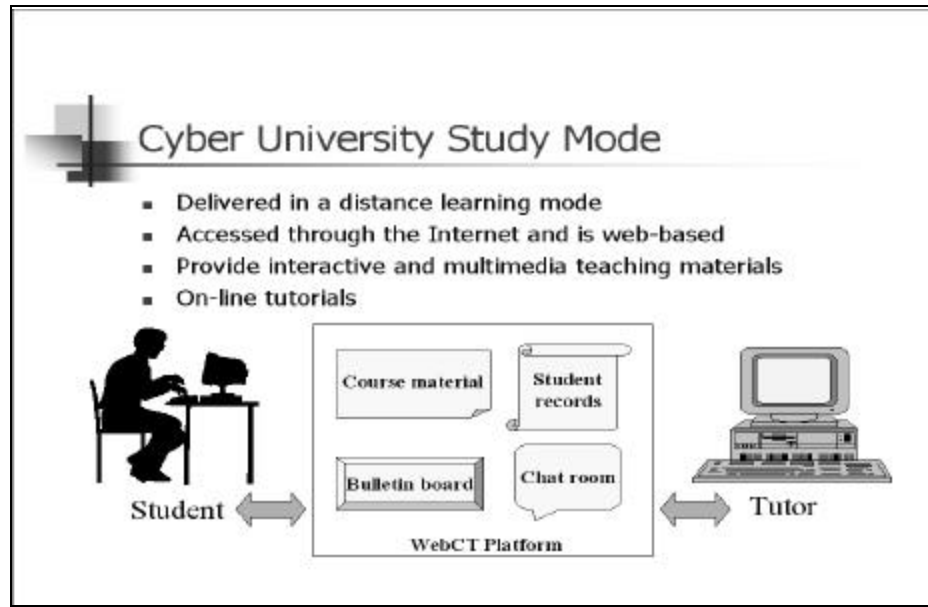


Figure 1. Web-based Learning Environment

At present, the following six subjects are being developed on the Web for the HKCyberU :

- Internet Computing
- E-Commerce and Application
- Web Advertising and Web Publishing
- Information Systems and e-Commerce Strategy
- OO Methods in Information System Development
- Software Quality Assurance

Each subject is being formally validated for on-line delivery through the Web. In the coming year, the Web-based version of the following subjects will be developed :

- Multimedia Systems and Applications
- Selected Topics in e-Commerce
- Data Mining & Data Warehouse
- E-Business Strategy

3. The Cyber University Studying Mode

Flexibility and mobility are the key features of HKCyberU courses. Learning is no longer confined to certain time or place. Teaching and learning can take

place without boundaries. As a cyber university, the HKCyberU has the following objectives: -

- To develop courseware
- To develop systems for interactive multimedia presentation
 - on the Web
 - to support remote learning
- To evaluate various implementations
- To value the effectiveness of Web-based teaching

As shown in figure 1 and figure 2, the on-line courseware is designed to provide students the ability to study anywhere anytime and at any pace. The students make use of the WebCT platform [3] to go through the on-line lectures and quiz at their own pace. To assist their study, the HKCyberU provides regularly scheduled on-line tutorials that give instant response to their questions raised, the bulletin board to post their queries, the on-line chatrooms to discuss with the tutors and classmates and the monthly face-to-face meetings with the lecturers. In spite of the challenges to deliver the course on-line, the HKCyberU requires all students to come in person for a face-to-face examination.

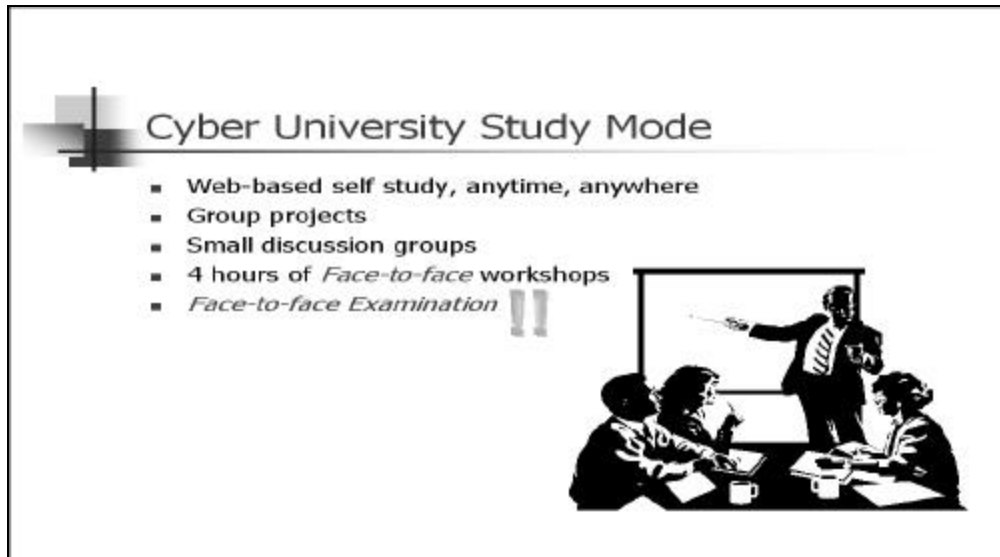


Figure 2. Format of Study

4. The Web-based Learning Environment

The web-based courseware is developed using the WebCT platform. It is a Web-based learning environment developed by the British Columbia University. The WebCT platform provides the facilities to create on-line courses with glossary of terms, chatrooms, assessment routines, student record tracking and bulletin board systems. Using the WebCT platform, the basic structure of a Web-based lesson consists Web pages that provide the detail of the subject contents. The Web-based courseware is supported by the followings:-

- Detailed subject contents
- Cyber Lectures
- Animations developed using Flash 5.0
- Multiple choice to test simple concepts
- Short questions to test understanding of sub-topics
- Exercises, assignments and case studies
- On-line tutorial via audio conferencing
- Bulletin Board discussions

Each cyber lecture is delivered in a slide presentation style, in which the instructor's lecture is recorded and streamed over the Internet. Student participating in the lesson has full control and interactivity over the streaming process. An example of a cyber lecture Web

page is shown in figure 3. After presentation of each important concept, student will be challenged with a couple of simple multiple choice questions and exercises to test on the understanding of the materials. An example of a short question session is shown in figure 4.

At the end of each Web-based lesson, a summary is provided to summarize what have been taught and what knowledge the student should have acquired. Additional readings and references will be given for student to read and research. For quicker navigation, cross-references in the form of Web hyperlink to the related sites are given.

Each lesson usually ends with a learning activity. The learning activity is designed to alleviate student's passive learning experience to active seeking and apply of knowledge to a problem domain. The learning activity is designed in a way that best suit the lesson which is being taught. Examples can include, but not limited to:

- Team Research: Students are grouped as teams to work on a single design or solve a complex problem as part of a mini project.
- Case Study: A simple case study in a form of a real example.



Figure 3. A Cyber Lecture Web Page

5. Creating a Sense of Community

To create a sense of community, students are divided to study groups of about 5 students per group during the briefing session at the start of the course. There will be at least one group assignment for each subject. The followings are done to create a sense of community :

- Internet case study and group discussion questions are specially designed to create a sense of community and to encourage interactions among students. This provides an environment for group-based tutoring.
- Subject leaders and tutors initiate discussions in the WebCT bulletin board for Internet case study and group discussions. Students are required to share current information on the web through the bulletin board.
- In addition, optional face-to-face tutorials are arranged throughout the course. The optional tutorials also provide a chance for students to do peer reviews of their work.

- A tutor provides on-line tutorials (for each study group) regularly using on-line video conferencing facilities and the WebCT chat room.

6. Course Evaluation

As this is the first year in the launch of HKCyberU courses, evaluation is important for the development of the courses. The followings are included in our evaluation process :

- Pre-launch evaluation : Before each subject is being launched, all contents are evaluated by a group of peers from staff, and a pilot group of students.
- Mid-course evaluation : During the middle of the course, an evaluation of the subject was carried out through discussion with students. A class representative also provides collective feedback on the course through staff-student consultative meetings.
- Formal evaluation : At the end of the course, questionnaires were distributed to students to collect feedback on each subject.

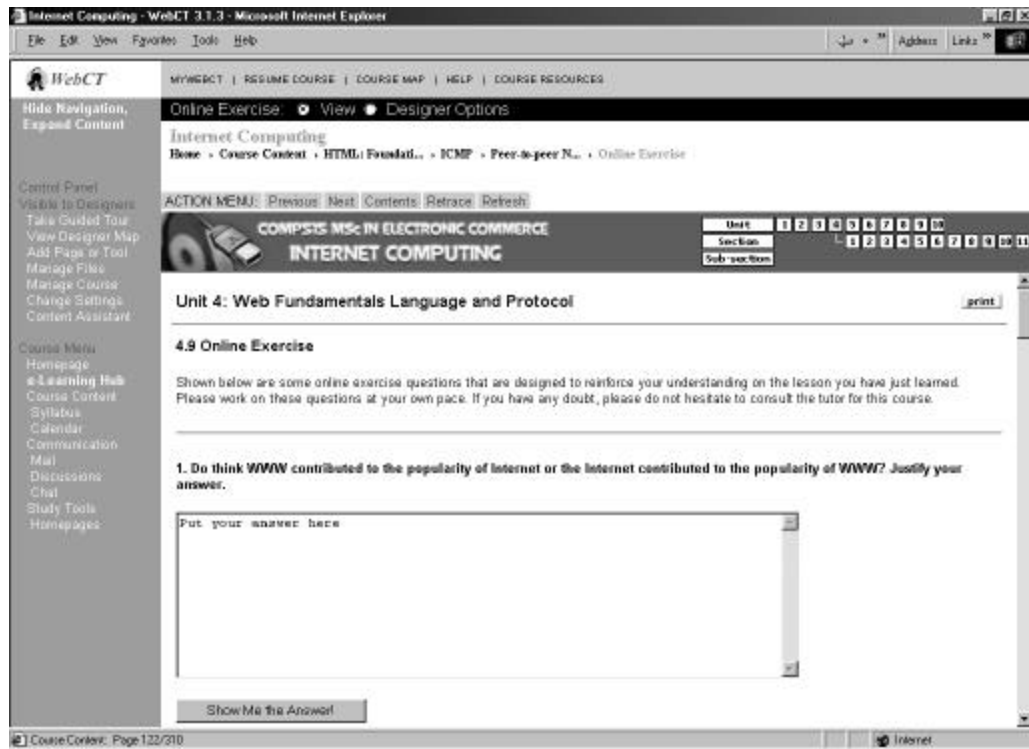


Figure 4. A Short Question Session Screen

- Administrative evaluation : On the administrative side, we also evaluated the support level from our team, which include an executive assistant, a demonstrator, the subject lecturer and a part-time technical writer and the project assistant for maintaining the Web materials on the Web.
- Formal evaluation through examination : results of HKCyberU students are compared with conventional class students.

We compared the examination results of two groups of students during the semester Sept 2000 to Feb 2001. One group of students attended the subject Internet Computing through conventional lectures and classes, the other group of students study the subject Internet Computing on-line through the HKCyberU. The two different groups of students are supervised by the same lecturers. Both groups of students attend a formal

examination in person with the same examination paper. Our objective is to test the null hypothesis: whether the mean GPA of the HKCyberU students and the conventional class students are different.

Since for the population variance of the mean scores for both populations for the HKCyberU and conventional class students are both unknown and assuming that they are equal, a t-test [1] is conducted using the pooled sample variance for unknown variance. Our calculations show that with $t = 1.14$ the null hypothesis cannot be rejected at 0.05 level of significance and that implies the mean of the examination scores for HKCyberU students cannot be considered as different from that of the conventional class students. The result concludes that although the way HKCyberU courses are being delivered in a different manner, it is still possible to attain the same standard as conventional courses.

7. Conclusion

In this paper, we have presented our experience in meeting the new challenges in delivering a masters degree in e-Commerce through Web-based teaching. Web-based teaching is considered as a new trend in education. The HKCyberU has successfully launched a Web-based post-graduate courses on-line. Student feedbacks for the course are positive. We have formally evaluated the examination results of a HKCyberU course and concluded that the standard of this course is the same as that offered in the conventional mode. In conclusion, the Web-based approach used in the M.Sc. (e-Commerce) is a successful example of an e-learning programme that is delivered solely through the Internet.

8. Disclaimer

This paper represents the personal opinion of the author, and does not represent the official standing of the Hong Kong Polytechnic University

9. References

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