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TOWARD AN EFFECTIVE QUALITY ASSURANCE OF WEB-BASED LEARNING: THE PERSPECTIVE OF DISTANCE LEARNING STUDENTS

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Introduction

There can be no denying that there has been an "exponential expansion of distance education" course (Hawkrige, 1995). The advantages of such a form of course provision are considerable: in particular it allows students, especially mature students who are likely to have considerable personal and professional commitments, to study without the personal and financial expense involved in returning to university as a "traditional" student. In a very real sense it represents opportunities for continuing education that are, already, enabling notions of lifelong learning to advance beyond rhetoric and into reality (Hedge, 1996).

Present situation in Hong Kong

The Open University of Hong Kong (OUHK), formerly the Open Learning Institute of Hong Kong (OLI), is the first university offering open and distance education in Hong Kong. The change of title, in May 1997, reflects the recognition of the University's academic standing, achievements and contributions over the past years.

Since its inception in 1989 the University has striven continuously to achieve its mission of providing high quality and flexible further education opportunities for adults. Currently the University offers more than 100 postgraduate, degree, associate degree and sub-degree programs.

In 2000, OUHK introduced the Web-based learning system in some of its courses. Quality assurance was seen as the most important issue. The initial focus of this transformation from traditional distance learning to Web-based learning was getting started and improving gradually through practice. At first only courses related to information systems or technology were chosen. It was thought that students enrolled in these subjects would more readily accept this new way of learning. The assumption was that these students were more familiar with the technology and had greater interest in technology-based subjects. Since then OUHK has very carefully and gradually added new elements to the Web-based learning transformation and it has now adopted Web-based learning as the direction for its expansion. OUHK will extend Web-based learning to more subjects and plans to use Web-based learning in distance education in offering courses to neighboring regions including Mainland China. The OUHK's experience of two years of experimentation in using the Web for university teaching and learning provides the perfect opportunity for us to learn what works well and what needs to be improved. This research focused on the perspective of distance learning students who have been involved in taking Web-based courses for learning in local tertiary institutions.

Research Questions

The purpose of this research was to explore the perspectives of the students on the quality assurance mechanism of the Web-based learning system in a distance learning context. The survey questions were designed to identify the critical success factors that might help to assure a model of quality effectiveness. After a review of the relevant literature on the

quality assurance of Web-based learning, this paper will try to answer the following questions:

- Are the quality benchmarks identified in the literature valid in the higher education sector in Hong Kong?
- Are the benchmarks taken seriously by the higher education institutions?
- To what extent are the benchmarks being incorporated into institutions' Web-based learning operation?
- Are there additional benchmarks that are important but are being left out of the model suggested by the literature?

The research was done by surveying a group of distance learning students drawn from the local academic institutions. The process mainly collected their opinions on various key issues related to quality assurance of Web-based learning.

Literature Review

There have been two main streams of study in Web-based learning. One stream has focused on organizational issues such as technology, performance measures, investment strategy and policy. Another stream has focused on behavioral issues of academic staff, course designers, university administrators and students.

Stream 1 – Organizational issues

The differences that Web-based learning makes

Rumble (1981, 1992) described how to evaluate the output of a distance education institution and the four criteria for use in evaluating the achievements of distance education system. Both the response time taken to produce a graduate and the input-output ratio were included in his assessment. He also suggested the four possible criteria should include the quality of output and cost-efficiency and cost effectiveness. Many researchers have believed that the success of Web-based learning would be technology driven. Technology based Web-based learning models were proposed which embraced high-tech interactive design and animations. They believed that this would eventually produce results equivalent to traditional face-to-face classroom learning methods. Arguments with this school of thoughts increased regardless of the rapid advancement of 3-dimensional graphics or interactive learning software media.

The role of technical and administrative support

Cooper (1999) discussed the three steps needed to develop an online course that use Web learning software. The results of his survey revealed that online students had a high overall level of satisfaction and were satisfied with the online messages and interactive features of the course. Cooper concluded that, if the course was well designed and carefully implemented, online instruction could provide an effective and appealing learning environment.

The above studies tended to deal with well-defined methodology and design perspectives. Usually they experimented with a relatively small group of students from traditional universities. The results on the use of Web-based learning were usually very positive. However, none of the studies was done on a large scale due to the limitation of budget and lack of a large number of students using Web-based learning as a formal learning

process. More important, the students sampled in these studies were relatively homogenous while students in a distance learning university are much more varied.

The role of tutors and learning support

Today's students need greater flexibility in when and where they learn (Davis, 1996) and this flexibility is gradually being met as institutions develop on-line learning opportunities for their students. Morgan (1993) suggests that, "Understanding learning from the learners' perspective is the crucial starting point for our work as teachers, trainers, and course designers in improving student learning in distance and open learning".

Berge (1997) explored the characteristics of online teaching with a survey of online instructors in colleges focusing on their roles, methods and online teaching and supporting strategies. The survey questions were developed based on Yelon's ten principles of excellent teaching. The results of this survey showed that the main factors affecting online teaching results in colleges were concerns about the student-centered design strategy, the self-reflective communication channel, collaborative operation and authentic learning.

Stream 2 – Behavioral issues

Students needs in Web-based learning

Hiltz (1994) analyzed learner perceptions of the "virtual classroom", in terms of convenience, interest and participation. The majority of learners felt that the online class was more convenient than the traditional one. Those with sufficient access to a computer system at home were most likely to appreciate the convenience. Most learners perceived that the online class demanded at least as much hard work as the traditional one. Enthusiastic learners spent a great deal of time on their Web-based learning just as traditional learners spent their time in libraries. There was no overall difference in the degree of interest by mode.

But more than a half of the learners reported that they were motivated by the fact that their opinions and comments would be read by others. A majority disagreed that the online class was more boring than a traditional class, more than a half felt that they took an active part in the online class. However, the competency level in using IT and the power of the facilities were not analyzed in this research. It was observed that the behavior of the learners differed greatly in frequency of use, liking of the facilities, dependency on the system and communication with teachers.

Researches in this area were more inclined to obtain students' "preferences". Surveys were targeted to collect the needs and expectations of the students. Very often, student needs were not matched with the objectives of the university. Controversial findings included students preferring free computer for private use to facilitate learning, the provision of free learning software and 24-hour, online tutor services.

Students concerns about using technology for learning

Marton and Saljo (1976a,b) used a "qualitative-difference-in-learning" scale, which compared students' study performance with behavioral factors such as liking for the subject, acceptance of teacher, peer pressure and satisfaction. The factors seem still important, and valid for today's Web-based learning environment, although the actual learning environment has changed a lot since the first use of this instrument. The research identified some important concerns of students in using Web-based learning, such as the choice of subjects (depending on whether they were technology-based), the cost incurred in taking a high-tech subjects and the arguable issue of whether "high-tech learning brought back high performance results".

Biggs (1987) researched student study processes. This research focused on identifying the factors contributing to effective learning and provided evaluation attributes to different types of learning. It included self-study, tutor-assisted tutorial, discussion forum and formal face-to-face lectures.

Most literature discussed technological aspects and focused on how students could improve and benefit from Web-based teaching, which involved the use of specialized learning software, technological aids for producing teaching material, a powerful hardware platform and convenient accessibility. Many researchers had made assumptions about computer usage competency and accessibility of the users to computer.

Moreover, most of the studies were done in the Western world where many fundamental issues, such as telephone connection and cheap computers, had been solved. In advanced countries most researches were at the stage of looking for "excellence" rather than "matching the real concerns of students".

The effectiveness of the Web as a tool for teaching and learning

Kubala (1998) found that online courses provided an individualized form of instruction and encouraged active student involvement in class discussion. Students' evaluation revealed that they felt online courses were more flexible and convenient than traditional classroom teaching. The research focused on identifying the motivation factors to stimulate students using Web-based learning. Suggestions were made to improve frequency of using Web-based learning that would in turn raise the level of demands from both teaching and learning. Effectiveness was achieved by higher usage, familiarization of process and optimal investment in training time and equipment.

Using all the previous study as a foundation, in year 2000 the Institute for Higher Education Policy has published a list of criteria (benchmarks) to serve as a model for quality assurance in Web-based learning. Based on the results of the study conducted by the Institute for Higher Education Policy, it is clear that there are several major areas to look at: Institutional Support, Course Development, Teaching/Learning Process, Course Structure, Student Support, and Evaluation and Assessment in ensuring the quality of Web-based learning. Since there are a lot of questions not yet clearly answered in previous studies of ensuring quality assurance for Web-based learning in Hong Kong. The study done by the Institute for Higher Education Policy looks like a practical approach for studying this issue in the local setting and will provide guidelines to explore the contributing factors in successful quality assurance model for Web-based learning.

Research Design and Method

A survey questionnaire was developed to measure distance learning students' perception of quality assurance in Web-based learning. The measurement of the items was drawn from a previous study carried out by the Institute for Higher Education Policy on the same issue. The questionnaire was structured using a 5-point Likert Scale. An example of the item is as follows:

In your opinion, are the following benchmarks important to ensure quality?

1. A documented technology plan that includes electronic security measures (i.e. password protection, encryption, back-up systems) is in place to ensure both quality standards and the integrity and validity of information.

Not Important	Somewhat unimportant	Not Sure	Important	Very Important
1	2	3	4	5

The Likert Scale questionnaire listed the 20 quality benchmarks and requested each respondent to rank each benchmark on the following criteria. To what extent is the benchmark important to ensure quality for Web-based learning (ranked from 1 = not important to 5 = very important)? Those respondents who did not have sufficient knowledge or experience relating to the benchmark could check the "Not Sure" category.

The actual results are provided in the next section of this study. The full list of survey questions is provided in appendix A.

Participants are identified and selected only if they have involvement with Web-based learning. They are sampled from universities and distance learning institutions in Hong Kong. There is no prerequisite in years of experience as long as they can understand the research intention and the general features of Web-based learning. A total of 140 questionnaires were sent out to the identified and selected participants studying in local tertiary institutions. A total of 87 questionnaires were collected of which all of them were used for the study and further analysis. It was very encouraging to the researcher since the return rate was 62% and it could be consider high for any kind of management research.

Limitations

In undertaking this research study, the researcher encountered only two limitations to the study. The first was the small sample size of 87 distance learning students, and the second that none of the respondents were willing to response the open-ended question at the end of the questionnaire. That may be due to the fact that all of the possible quality benchmarks were already listed in the questionnaire already.

Findings and Analysis

The 87 respondents came from 8 local tertiary institutions in Hong Kong. The questionnaire survey was done in July to August 2002. The following sections provide a summary of the quantitative analysis of this survey. It should be noted that all of the institutions are included in the data presented in this study. Because the intention of this study is to validate the benchmarks for the higher educational sector in general, it serves no purpose to separate the data for each institution. The following discussion represents a consensus of a majority of the institutions in the study. It is, therefore, not appropriate to assume that the attribute outlined in the discussion always represent each and every institution. No effort was made to apply any statistical test to ascertain the degree of importance of a benchmark. Instead, the researcher only used some simple descriptive statistics (mean, standard deviation and frequency) to guide the whole analysis of this study. The section is organized around the six categories of benchmarks: Institutional Support, Course Development, Teaching/Learning Process, Course Structure, Student Support, and Evaluation and Assessment.

Institutional Support

All of the benchmarks in this category were considered important to ensure quality for Web-based learning since all of them achieved rating of (3.83) or above. The benchmark addressing a documented technology plan (No. 1) received exceptionally high rating of (4.10). The benchmark addressing the reliability of the technology delivery system (No. 2) achieved high rating of (3.83). This can be easily explained in the following scenarios: "If the lights go out in a traditional classroom, it may just be an inconvenience but if the system fail then it will be a disaster for the Web-based learning environment." The benchmark regarding a centralized support system (No. 3) obtained a rating of (3.86).

Table 1. Summary Statistics on the importance of the Institutional Support Benchmarks

	Mean	Standard Deviation	Frequency (1)	Frequency (2)	Frequency (3)	Frequency (4)	Frequency (5)
Q1	4.10	0.72	1	0	12	50	24
Q2	3.83	0.67	0	0	28	46	13
Q3	3.86	0.65	0	3	16	58	10

Course Development

The all three benchmarks relating to course development received a quite high rating from the respondents. The benchmark addressing the guideline for minimum standards (No. 4) received a rating of (3.70). The benchmark addressing the instructional materials (No. 5) received the highest rating of (4.15) with regard to all benchmarks in the study. The benchmark addressing the course design (No. 6) also received a high rating of (4.00). This reflected that local distance learning students agreed that instructional materials and course design were important benchmarks that the results were comparable to the previous study done in the US.

Table 2. Summary Statistics on the importance of the Course Development Benchmark

	Mean	Standard Deviation	Frequency (1)	Frequency (2)	Frequency (3)	Frequency (4)	Frequency (5)
Q4	3.70	0.72	0	3	30	44	10
Q5	4.15	0.62	0	1	8	55	23
Q6	4.00	0.68	0	2	14	53	18

Teaching / Learning Process

The majority of benchmarks regarding the teaching / learning process were considered important with the exception of benchmark (No. 7) student interaction which only got a rating of (3.61). As Otto Peters, author of *Learning and Teaching in Distance Education* wrote: "If we take distance education seriously and understand it to be something more than the mere distribution and reading of study materials, we must provide sufficient opportunities for dialogues. If, in addition, we understand academic studies as a process in which the aim is education through knowledge, we cannot do without a considerable proportion of dialogical learning and teaching in distance education." (Peters, 1999, pg. 39) The notion of interaction between student and faculty is highlighted here is not only because it is central to the quality of Web-based distance education, but also because it leads to the realization that Web-based distance education is evolving its own pedagogy. It has become increasing evident that interactivity is the condition for quality in Web-based distance education. Indeed, many would say that it is crucial for any type of learning. The other two benchmarks that address feedback and effective research (No. 8 and 9) fair much better than student interaction, both of them received high rating of (3.98) and (3.93) respectively.

Table 3. Summary Statistics on the importance of the Teaching / Learning Process Benchmarks

	Mean	Standard Deviation	Frequency (1)	Frequency (2)	Frequency (3)	Frequency (4)	Frequency (5)
Q7	3.61	0.67	0	2	37	41	7
Q8	3.98	0.71	0	3	14	52	18
Q9	3.93	0.80	0	5	16	46	20

Course Structure

In general, the course structure benchmarks received high rating from the respondents. The benchmark addressing student advising (No. 10) scored a rating of (3.71). On the other hand, the benchmark addressing supplemental course information (No. 11) received a rating of (3.98). All these reflect that the institutions need to put up more effort in term of student advising. The high rating for the benchmark regarding library resources (No. 12) scored (4.09) was worth nothing. This may due to the fact that in recent years all of the local institutions had invested a lot of resources into the technology and infrastructure of electronic library that could match the standard of the Western countries. The benchmark addressing the time requirement (No. 13) received a rating of (3.80). Given the fact that the innovative and dynamic nature of the Web-based learning environment, particularly the capacity for distance learning students to pace themselves in a variety of ways, fast and hard rules on the precise response time for a faculty member or how much work should be accomplished in a specific time period is totally inappropriate.

Table 4. Summary Statistics on the importance of the Course Structure Benchmarks

	Mean	Standard Deviation	Frequency	Frequency	Frequency	Frequency	Frequency
Q10	3.71	0.70	0	3	34	41	11
Q11	3.98	0.70	0	3	16	48	20
Q12	4.09	0.80	1	3	9	48	26
Q13	3.80	0.64	0	2	22	54	9

Student Support

The all four benchmarks relating to student support received a mixed reaction from the respondents. The benchmark addressing information for student (No. 14) received a high rating of (3.93). The benchmark addressing training for students (No. 15) scored a low rating of (3.48). The benchmark addressing technical assistance (No. 16) also got a low rating of (3.37). The benchmark addressing complaint system (No. 17) received a high rating of (4.01).

It appears that for at least two benchmarks concerning training for students and technical assistance, the local institutions feel they need more work at those areas.

Table 5. Summary Statistics on the importance of the Student Support Benchmarks

	Mean	Standard Deviation	Frequency	Frequency	Frequency	Frequency	Frequency
Q14	3.93	0.62	0	2	14	59	12
Q15	3.48	0.78	0	10	30	42	5
Q16	3.37	0.85	2	8	40	30	7
Q17	4.01	0.77	0	4	13	48	22

Evaluation and Assessment

The all three benchmarks relating to evaluation and assessment received a mixed reaction from the respondents. The benchmark addressing evaluation process (No. 18) scored a low rating of (3.62). The benchmark addressing program effectiveness (No. 19) received the lowest rating of (3.36) among all 20 benchmarks on the survey. The benchmark addressing learning outcomes (No. 20) scored a modest rating of (3.78). By large, all

participated institutions had systems in place to address evaluation and assessment. In the Western countries, the institutions collected huge amount of data in the areas of financial efficiency, student achievement, faculty satisfaction, student satisfaction, student retention and student demand in order to evaluate their programs effectiveness. Therefore, it was surprised to see that program effectiveness scored such a low rating in the local setting.

Table 6. Summary Statistics on the importance of the Evaluation and Assessment Benchmarks

	Mean	Standard Deviation	Frequency (1)	Frequency (2)	Frequency (3)	Frequency (4)	Frequency (5)
Q18	3.62	0.69	1	3	28	51	4
Q19	3.36	0.65	0	5	49	30	3
Q20	3.78	0.71	0	2	27	46	12

Conclusion

The Web is a major technological break through that reshaped not only our society but also that of academic institutions from around the world. In view of this, academic institutions have to make the most of the Web for both learning and teaching, and one progressive development of this is the use of Web-based learning in distance education environment.

This study for the most part revealed that the benchmarks were crucial when considering the quality assurance of Web-based learning and in general the participated institutions strove to incorporate them into their policies, practices and procedures. At the same time, there were few benchmarks that did not enjoy consensus among the distance learning students and in some instances were not even considered important to ensure quality for Web-based learning. In this sense, the quality benchmarks identified in the literature can be considered valid in the higher education sector in Hong Kong. Since there were no response or feedback for the open-ended question of the survey, it lead to the conclusion that there would not be any additional benchmarks that need to be included into the model.

In conclusion, the results shed some light on how the students felt about the quality assurance system of Web-based learning in the local academic institutions. Moreover, the results of this study can assist policymakers such as university administrators and accrediting bodies in making reasonable and informed judgments with regard to how to improve the system more so that the distance learning students can benefit the most.

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Appendix A – Survey Questions

Institutional Support Benchmarks

- 1. A documented technology plan that includes electronic security measures (i.e. password protection, encryption, back-up systems) is in place to ensure both quality standards and the integrity and validity of information.**
- 2. The reliability of the technology delivery system is as failsafe as possible.**
- 3. A centralized system provides support for building and maintaining the distance education infrastructure.**

Course Development Benchmarks

- 4. Guidelines regarding minimum standards are used for course development, design, and delivery, while learning outcomes – not the availability of existing technology – determine the technology being used to deliver course content.**
- 5. Instructional materials are reviewed periodically to ensure they meet program standards.**
- 6. Courses are design to require students to engage themselves in analysis, synthesis, and evaluation as part of their course and program requirements.**

Teaching / Learning Process Benchmarks

- 7. Student interaction with faculty and other students is an essential characteristic and is facilitated through a variety of ways, including voice-mail and / or email.**
- 8. Feedback to student assignments and questions is constructive and provided in a timely manner.**
- 9. Students are instructed in the proper methods of effective research, including assessment of the validity of resources.**

Course Structure Benchmarks

- 10. Before starting an online program, students are advised about the program to**

determine (1) if they possess the self-motivation and commitment to learn at a distance and (2) if they have access to the minimal technology required by the course design.

11. Students are provided with supplemental course information that outlines course objectives, concepts and ideas, and learning outcomes for each course are summarized in a clearly written, straightforward statement.

12. Students have access to sufficient library resources that may include an "e-library" accessible through the Internet.

13. Faculty and students agree upon expectations regarding times for student assignment completion and faculty response.

Student Support Benchmarks

14. Students receive information about programs, including admission requirements, tuition fees, books and supplies, technical and proctoring requirements, and student support services.

15. Students are provided with hands-on training and information to aid them in securing material through electronic databases, interlibrary loans, government archives, news services and other sources.

16. Throughout the duration of the course/program, students have access to technical assistance, including detailed instructions regarding the electronic media used, practice sessions prior to the beginning of the course, and convenient access to technical support staff.

17. Questions directed to student service personnel are answered accurately and quickly, with a structured system in place to address student complaints.

Evaluation and Assessment Benchmarks

18. The program's educational effectiveness and teaching/learning process is assessed through an evaluation process that uses several methods and applies specific standards.

19. Data on enrollment, costs and successful / innovative uses of technology are used to evaluate program effectiveness.

20. Intended learning outcomes are reviewed regularly to ensure clarity, utility and appropriateness.

21. List down 3 most important quality benchmarks that are not listed in the questionnaire and you feel are relevant to Web-based learning.

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