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An Analysis of Learners' Interactions with Course Package and Learning Support Services in Distance Learning

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Abstract: This study implemented a survey on learners' utilizations and experiences of various formats of distance learning resources spanning from the sub-system of course package to that of learning support and services. One of the main findings was the unbalanced development between two sub-systems, which means that the educational institution focuses much on the development of course packages while to some extent neglects the importance of providing sufficient learning support and services. It is one of the most urgent tasks to establish a more powerful, flexible, and effective learning support and services system in order to assure quality distance learning.

Introduction

Distance Learning (DL) is more than 150 years old and has been a practical option for many students and institutions, but the advances in Information and Communication Technology (ICT) has accelerated the interest in DL to an unprecedented degree. A growing use of DL methods is being implemented throughout postsecondary education. Many higher education institutions are adopting distance and online learning as the next logical step in educational delivery systems (Selingo, 1998). However, as O'Malley and McCraw (1999) documented, the effectiveness of distance and online learning and its impacts on students' learning have not been well researched prior to adoption. In China, distance education had been confined within the Central Radio and TV University (a huge university system) during the last two decades, until Tsinghua University, a leading

comprehensive university in China, established its E-Learning system in 1997. In this system, an integrated technological solution was adopted to combine computer networks with satellite-based Digital Video Broadcasting (DVB) and Cable TV technologies to cope with the bandwidth and access limitations of the computer network. In 1999, the Ministry of Education launched the Modern Distance Education Project aiming at promoting the development of lifelong learning systems across China. So far, more than sixty prestigious universities in China have been involved in this project to establish Web-based Education Schools to offer DL programs spanning from vocational training to undergraduate and graduate level education.

With the rapid development of online and distance learning, the problem of quality assurance emerges and entails in-depth research to find out how to promote effective online and distance learning. In one of the earlier studies, Zhang, Li, Duan and Wu (2001) investigated learners' self-efficacy beliefs of DL, successes with DL, and the relationship of their characteristics and DL. In the results, the students displayed relatively positive DL self-efficacy, which was closely related to their intrinsic motivation and Self-Regulated Learning (SRL) skills. The students perceived to have attained much in most of the spheres of learning objectives including knowledge understanding, communication skills, study skills and the like. DL self-efficacy, SRL skills, and computing skills were proved to be the important predictors of learners' overall attainments in DL.

The present study will be focused on learners' interactions with the various types of DL resources during the learning processes. There are two essential sub-systems in an effective DL system, which are: the sub-system of the course package that is responsible for the design, development, and delivery of learning content, and the sub-system of learning support and services that promotes and facilitates distance learning by providing learners with the opportunities and the tools to interact with the institution, instructors and mentors, peers, and the wider communities (see Holmberg, 1989). These two sub-systems continue to function when DL has evolved from its earlier stages to the era of online e-Learning. This study will explore how learners have interacted with and benefited from the various types of learning resources spanning from the sub-system of course package to that of learning support and services. The problems that lie in the two sub-systems and the directions for future development will be discussed based on the quantitative analysis. This study utilized DL at Tsinghua University as focus because Tsinghua University is a pioneer in online and distance learning in China and has established the typical and representative DL system.

Methodology

The subjects in this survey were 112 distance learners of Tsinghua University. 32.7% of them were female, and 67.3% were male. 84 of the learners were graduate students majoring in computer applications, business management, or civil and commercial law. 28 of them were undergraduate students majoring in law, foreign language, or economics. Most of the learners have full-time jobs as business managers or professional technologists.

A questionnaire was designed to reveal how learners had interacted with and benefited from the various types of resources made available to students at Tsinghua University. The content in the questionnaire involved: (1) the demographic data and primary information of the subjects; (2) learners' ratings of their interactions with various formats of learning resources; (3) a four-point Likert scale requesting learners to indicate their perceived attainment in DL from 9 spheres, which will be elaborated in the results. The self-perceived

attainment was chosen as the indicator of the effectiveness of DL because it is difficult to evaluate the multi-facets outcomes of DL, and also the perceived attainment per se is of great importance in evaluating DL; (4) learners' experiences of distance learning. The questionnaire had been reviewed and revised by three experts to help improve its reliability and construct validity. The specific items in each part can be seen in the result analysis section.

Result and analysis

Interactions with Various Formats of Learning Resources

Reflecting the scope of distance learning resources provided by Tsinghua University, eleven formats of learning resources were listed in the questionnaire, and required the learners to indicate: (1) how frequently they had used each format of the resources, (2) the extent to which they had benefited from the learning resources, (3) the demands for the improvement and enrichment of the learning resources. Four-point Likert type scales (1-4) were used for all the questions developed in each of these three areas. The eleven formats of distance learning resources were: (1) Digital Video Broadcasting of lectures; (2) online courseware; (3) CD-ROMs; (4) question-answering and discussion through two-way videoconference; (5) textbooks and other printed materials; (6) electronic resources in the university library; (7) related websites; (8) online communication tools (e.g. email, BBS, chat); (9) consulting instructors via telephone; (10) audio tapes; (11) The helps and supports from local teaching assistants.

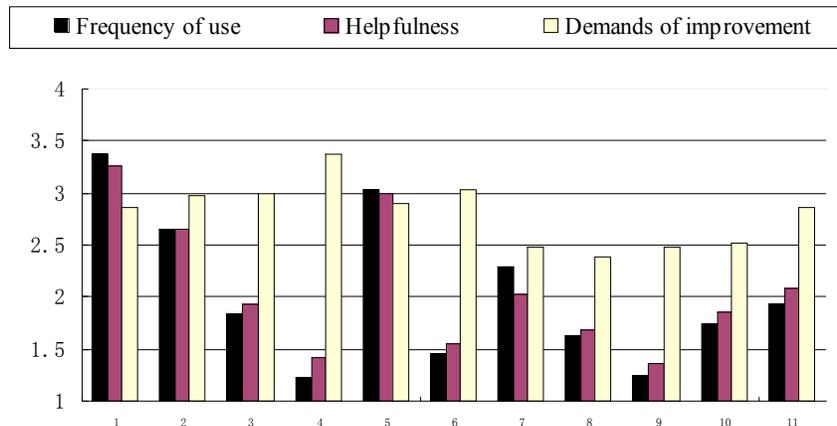


Figure 1: Learning ratings for the eleven formats of distance learning resources

As was revealed by MANOVA, a significant difference exists among the responses relating to the questions on the frequency of each of the eleven formats of learning resources ($F(10,920)=69.69, p=.000$). Three most frequently used formats of resources in sequence are: (1) Digital Video Broadcasting of lectures, (5) textbooks and other printed materials, and (2) online courseware. Three most scarcely used formats are: (4) question-answering and discussion through two-way videoconference, (9) consulting instructors via telephone, and (6) electronic resources in the university library. Similar trends exist in learners' ratings for the helpfulness of the resources. When it comes to the demands for the improvement and enrichment of the resources,

significant main difference was observed among the eleven formats ($F(10, 660)=10.95, p=.000$). The learners indicated great demands for increasing the opportunities of videoconference-based discussion, opening more library resources and services to distance learners, and providing more instructional CD-ROMs of better quality.

The Status of the Course Package System and Learning Support System

In order to gauge the status of the two sub-systems in DL, we aggregated the ten of the above eleven formats of learning resources into two categories: (a) course package that is responsible for the delivery of learning content. It includes (1) Digital Video Broadcasting of lectures, (2) online courseware, (3) CD-ROMs, (5) textbooks and other printed materials, and (10) audio tapes; (b) learning support and service that provides learners with opportunities and tools for interactions with the institution, instructors, peers, and the wider communities. It encompasses the five formats of the resources including (4) question-answering and discussion through two-way videoconference, (6) electronic resources in the university library, (8) online communication tools (e.g. email, BBS, chat), (9) consulting instructors via telephone, and (11) help and support from local teaching assistants. Visiting related websites was not included in either of the two categories because it is not deliberately designed and provided by the distance education institution. Learners' ratings of the two categories of resources in terms of the frequency of use, helpfulness in learning, and the demand for improvement and enrichment are depicted in Figure 2.

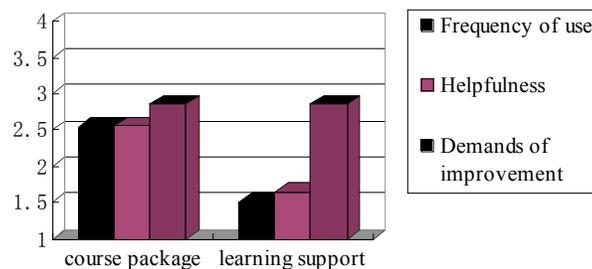


Figure 2: Learners' ratings for the course package and learning support systems

MANOVA, using the categories of the learning resources as the within-subject factor and the type of students (graduate / undergraduate) as the between-subject factor, indicated that there was a significant difference in the frequencies of using the two categories of learning resources ($F(1,107)=293.26, p=.000$). The frequency of using course packages was distinctively higher than that of using learning support and services. A clear interaction was observed between the two factors ($F(1, 107)=5.87, p=.017$), indicating that undergraduate students had used the learning support and services more frequently than graduate learners. Similar trends were also observed in learners' ratings of the helpfulness of the learning resources. As far as the demands for improvement and enrichment were concerned, the learners showed great demands for both of the categories - to access higher quality course packages and to obtain much more comprehensive and convenient learning support and services.

The In-depth Analysis of Learners' Experiences of the Course Package and Learning Support Services

In order to collect more in-depth information about learners' experiences of the course package and learning support services in DL, this survey included special items to ask learners to report their experiences of DL in the spheres of course package and learning support services. The learning support services were divided into two types of interactions in this section: the interactions with instructors and the interactions with peers. A six-point Likert type scale was used to ask the learner to indicate the extent to which he/she agrees with the provided statements, from 1 (strongly disagree) to 6 (strongly agree). Table 2 gives the learners' responses to the items.

	Items	Mean	SD	Sub-total
Course package	My teachers always use effective visual methods in the lectures.	4.14	1.21	
	Overall, the lectures are very clear and good at facilitating my understanding.	4.12	1.03	3.78 (M)
	The textbooks are not adaptive to self-study.	3.76	1.29	.78 (SD)
	Adequate learning materials have been provided for the distance courses.	3.57	1.20	
Interaction with instructors	I can contact my instructors conveniently whenever I need.	2.76	1.24	
	I don't know whom I should ask for helps when I have difficulties or problems in learning.	3.66	1.38	
	My instructors usually handle my assignments in time.	3.39	1.27	3.06(M)
	My instructors usually give me helpful learning advices in the feedback to my assignments.	2.76	1.32	.81(SD)
	I often ask questions to my instructors via email.	2.65	1.23	
	The local teaching assistants have done good jobs in facilitating my learning.	3.32	1.48	
Interaction with peers	I often have face-to-face discussions with my classmates in learning.	3.94	1.32	
	I feel lonely in learning and eager to communicate with others.	3.75	1.35	3.16(M)
	I often have discussions with my classmates through the Internet (email, chat, BSS).	2.41	1.13	.83(SD)
	The courses have provided adequate opportunities for discussion and communication.	3.08	1.29	

Table 1: Learners' experiences of the course package and learning support and services

MANOVA revealed that there was a significant difference in learners' evaluations for the three dimensions ($F(1, 109)=85.36, p=.000$), with the highest rating for course package and the lowest rating for the interaction with instructors. The surveyed distance learners tended to feel inadequate learning support from their instructors and mentors. As the specific items display, it is not convenient for the learners to consult their instructors for learning help. The local teaching assistants had not functioned as expected in promoting learners' learning activities. Besides, more than half of the learners reported that their instructors couldn't grade and return their assignments in time, and seldom gave them meaningful learning advice in their feedback. It is also important to notice the insufficiency in the interactions among the learners. It is regretful that they didn't take the advantages of the Internet to communicate with their peers frequently. About 70% of the learners reported to have felt somewhat lonely in learning and eager to communicate more with their classmates. All the outcomes support our previous findings that the current DL system is suffering the unbalance between the course package

and the learning support sub-systems. It is one of the urgent missions to establish a more powerful and facilitative learning support and service system in order to enhance the quality of DL.

In order to examine the differences between the freshmen and older students in their experiences of DL, we divided the surveyed students into two groups: the freshmen who were enrolled in Tsinghua University's DL program in 2000 and those older student who began the DL programs from 1998 or 1999 and have more than one year of experiences with DL. The two groups' responses to the above three dimensions were shown in Table 2. Significant or marginally significant differences were observed between the two groups on the dimensions of course package ($F(1,104)=4.92, p=.029$) and the interaction with peers ($F(1,104)=3.49, p=.065$), showing that the older students had better experiences in the two perspectives. DL is such a distinctive format of learning and needs special strategic adaptations by the learners. These senior learners might have accumulated more experiences in distance learning and developed better learning strategies. Therefore, they could make better uses of the course package as well as opportunities for the interactions with their peers.

	Course package		Interaction with instructors		Interaction with peers	
	Mean	SD	Mean	SD	Mean	SD
Freshmen	3.68	.79	3.00	.83	3.10	.86
Older students	4.02	.71	3.22	.75	3.41	.69

Table2: Experiences of distance learning among freshmen and older students

Discussion

In order to gauge the current status of the DL system at Tsinghua University as a case of the DL carried out in China, this study made a survey on how learners had interacted with the course package and learning support resources during distance learning. One of the important findings is the distinctive unbalance between the two sub-systems, which means that the distance education institution usually focuses much more on the development of course packages while to some extent neglects the importance of providing complete and convenient learning support and services.

The sub-system of learning support and services plays a critical role in effective DL system in that it provides learners with channels and opportunities to interact with the institution, instructors, peers, and the wider communities. All types of interactions are insubstitutable in order to engage learners in the ongoing distance learning and help them resolve the encountered difficulties and problems, keep the interests and motivations for learning, and gain a sense of belonging to the learning community. Unfortunately, many distance education institutions concentrate too much on the development and delivery of course package while they overlook the importance of learning support and services, assuming that the functions of learning support and services could be "packed into" the course package to cover the varieties of needs of the learners (Sewart, 1993). This is definitely a misconception. Learning support is the type of service that is provided along with the ongoing learning processes, rather than the predesigned product that can be packed and delivered in bulk.

As this survey displays, the available learning support and services in the present DL system are relatively insufficient in terms of quantity and quality. The learners have few chances to contact their instructors or mentors to ask questions, to communicate with their classmates in learning, or to access the online resources

and services of the university library. It is one of the most urgent tasks to establish a more powerful and effective learning support and service system in order to assure qualified distance learning. The specific treatments in this perspective might include:

(1) Allotting adequate assistant tutors with explicit responsibilities. The Open University of UK has good experiences in this perspective to allot one tutor for about every 23 students. There are explicit requirements for the tutors, such as marking learners' assignments according to the provided standards, giving learning advice in feedback with assignments, participating in the BBS discussions, and answering learners' questions and inquiries via email and telephone, and so forth. These treatments will help to overcome the prominent insufficiency in the interactions between the distance learners and their instructors.

(2) Developing and adopting more powerful Web-based Learning Management System (LMS), with which the institution can provide comprehensive learning support. The LMS can also provide automatic, intelligent, and adaptive learning services (e.g. intelligent question-answering services).

(3) Building online learning communities to promote the communications and collaborations among the distance learners as well as enhancing the sense of belonging (see Moller, 1998; Zhang, 2000). The variety of Computer-Mediated Communication (CMC) tools in the Internet-based distance education can be used to promote the substantive interactions among distance learners. Several researchers have studied the teaching methods for CMC (Paulsen, 1998) and learners' actual interactions based on CMC tools (e.g. Levin, Waugh, Chung, and Miyake, 1992; Fishman, 2000).

(4) Increasing the amount of digital learning resources and services in the university library to promote convenient access for distance learners.

(5) Arranging necessary face-to-face activities to facilitate distance learners in resolving their problems in learning and to benefit from the on-campus resources of the university.

More comprehensive and specific learning support services can be referred to Khan (2001)'s framework for open, flexible, and distributed learning and Kumiko and Pogroszewski (1998)'s Virtual University Reference Model. Kember (1995) has also offered a conceptual model of distance education and recommendations for policy and practice that link the principles of instructional design and the provision of learner support.

As far as the status of the course packages in DL is concerned, the most frequently used three formats of resources in sequence are Digital Video Broadcasting of lectures, textbooks and other printed materials, and online courseware. CD-ROMs are also frequently used to provide offline courseware and learning materials. These results reflect the current status of the course resources structure in the present DL practices carried out in China. The course resources model that integrates computer-based instruction, satellite-based DVB, as well as printed materials is a cost-effective model adapting to the situations of the technological infrastructure and the social economic development in China. In this survey, the learners also demonstrated great needs for the improvements and enrichments of the course resources, particularly to increase the amount and quality of CD-ROM-based materials and online courseware, as well as to provide rich printed materials that are adapted to distance learners' needs. The improvements and enrichments of the course resources imply another direction for the future development of DL in China.

Conclusions

In conclusion, in order to gauge the current status of the DL system at Tsinghua University as a case of the DL carried out in China, this study made a survey on how learners interact with the course package and learning support resources during distance learning. One of the important findings is the imbalance between the two sub-systems, which means that the distance education institution usually focuses much more on the development of course packages while to some extent neglects the importance of providing comprehensive and convenient learning support and services. It is one of the most urgent tasks to establish a more powerful and effective learning support and service system in order to assure qualified distance learning. These conclusions are drawn based the case study of DL at Tsinghua University. Further studies need to be conducted to involve a wider sample and more in-depth analysis and comparisons across the cases.

Acknowledgement

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