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KEY FACTORS FOR A FULLY ONLINE E-LEARNING MODE: A DELPHI STUDY

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Abstract

This paper investigates the views of four different perspectives to determine the key factors that are considered to be essential in order to enable the delivery of a postgraduate course in a fully online e-learning mode. These perspectives include students, IT staff, academic staff and management. The key factors were identified through the use of a three-round Delphi study. Khan's (2001) e-learning framework was used to categorise the identified factors. The outcome of this study has shown that there were huge differences between the four different perspectives on what should be considered as priority factors. Despite the fact that there was no consensus amongst the four different views, the outcomes of this study has provided a very rich picture of what is really required for this kind of learning and teaching mode.

Keywords

E-learning, online Learning, Delphi study, Khan's E-learning Framework

Introduction

This paper investigates the key factors that would enable the School of Information Systems (SIS), which is housed within the Business Division of a large university in Western Australia, to offer a postgraduate course in a fully online e-learning mode. This study aims to identify the key factors as perceived by four different categories of respondents: student, academic, management and IT support. A framework derived by Khan (2001) on e-learning was used in this study to categorise the factors that were identified. Identifying key factors or issues before offering a fully online education delivery mode is essential for management considerations. A fully online mode implies that all learning activities and other related services are integrated and delivered online (Stuparich, 2001).

What is E-learning?

E-learning can encompass disciplines such as collaboration, traditional learning and content management (Gartner, 2002). It is also considered as a modern type of distance education that is delivered via the use of computers, Internet and multimedia presentation (Lau, 2000). Cisco (2001) defined e-learning as a combination of web-based tools that can enhance all traditional classroom modes - learning experiences, textbook study, CD-ROM and traditional computer based training. Kirschner and Paas (2001) points out that e-learning include online learning, Web-based training and computer-based training. Stuparich (2001) refers e-learning as "the use of digital technologies to support and deliver some or all of the teaching and learning for a particular unit of study".

E-learning Framework

Khan (2001) developed a framework for e-learning, which contained eight dimensions: institutional, pedagogical, technological, interface design, evaluation, management, resource support, and ethical. Each dimension possessed sub-dimensions, focussing on particular aspects of an e-learning environment. Khan's framework provides a list of considerable factors that would be needed for the creation of a successful experience for diverse learners (Khan, 2001). Khan's e-learning framework is used as a theoretical framework to classify factors identified in this study.

Research Method

A Delphi study was used in this research. The Delphi method or technique is mostly used for problem solving, planning, and decision-making (Dunham 1998). It can be categorised as a special kind of survey research as questionnaires are used for data gathering. However, Delphi is an iterative process where controlled feedback is required, typically from a group of experts (Schmidt 1997). The term 'expert' can denote anyone capable of contributing some input towards the research problems (Pill 1978 cited in Armitage 1999). In this study, the selected 'experts' were those who would be directly involved in elearning: the students, teaching staff, support staff and management.

The Delphi method has been widely used in IS research to identify key issues, risk factors and other considerations (see Pervan, 1994; Schmidt, 1997; Schmidt et al, 2001). This research method is suitable for this study as its aim was to investigate the key factors of a fully online e-learning mode.

A three-round Delphi study was conducted during the period of April to May in 2002. The methodology employed was initially based on a four-round study by Schmidt et al. (2001). The first round was used to elicit ideas from participants, the second round to validate those ideas, the third one to reduce the list of ideas to a meaningful size and then, the last round to rank the final list. Due to time constraints and the low response rate in the second round, the study was customised by combining the third and fourth rounds. Linstone and Turoff (1975) pointed out that Delphi could be administered to a size of ten to fifty people. In this study, the total number of participants ranged from 25 to 45 depending on the round being conducted.

Data Collection

In the first round, participants were required to answer the research question of this study: "What are the key factors that need to be considered in order to enable the SIS to offer a postgraduate course in a fully online e-learning mode?" Following this round, the same respondents who took part in the first round were fed back the summary of their results and were required to provide their feedback (refinement) for the second round. Non-participants in the first round were also asked to read and validate the list and to add new factors at the end if necessary. In the third round, the list of factors were further refined and using a 5-point Likert Scale, participants were asked to rate the list and then to rank in term of importance the categories that were derived from Khan's e-learning framework.

Results Of The Study

Table 1 shows the number of participants and the number of factors identified in each round of the study.

	Students	Lecturers	Management	IT Staff	Factors
1st round	13	8	6	4	186
2nd round	15	4	2	4	69
3rd round	25	10	6	4	54

Table 1: Number of participants and factors in each round of the study

A total of 186 factors were identified from the four different panels of respondents in the first round of questionnaire. These factors covered a wide range of issues including those of pedagogical, technological, managerial and other aspects inline with Khan's framework. Factors identified by each type of participants varied significantly when considering what was deemed as important.

By grouping the similar factors amongst those 186 being identified in the first round, a result of 69 items formed the basis for the second round of study. These 69 items were then arranged under the dimensions of Khan's e-learning framework and were fed back to both participants and non-participants in the first round. They were required to eliminate, refine and validate these 69 items. They were also asked to add new factors at the end.

From the feedback gathered, some of the factors were rephrased accordingly. It was discovered amongst the list of 69 items; about 10-15 items were considered as duplicates. Thus, necessary measures were taken to remove these duplicates or to combine those together to make them appeared as one single unique factor. This process had resulted in the final 54 factors that were to use in round three of the study. Table 2 represents a summarised version of the items identified arranged under the modified Khan's e-learning framework (with the split of the institutional dimension). Due to space constraints, results of the ranking of factors will not be reported in this paper.

PEDAGOGICAL	High broadband Internet connection
Prompt feedback	System error tracking
Alternative submission of assignments	Standardisation of procedures
Interactive course	Verifying identity of students
Learning styles	Scalability of the system
Teacher as facilitator	INTERFACE DESIGN
Student commitment	User friendly e-learning system
Multimedia tools/technologies	Photographs of students
Agreed time for communication	Features to come back on left off task
MANAGEMENT	INSTITUTIONAL-ADMINISTRATIVE AFFAIRS
Staff emails management	Cost and benefit
Up to date course information	Training for students/staff
Tools/features for update	Higher fee due to scarcity of resources
Students from different time zones	Cost factor in some countries
RESOURCE SUPPORT	University incentives
Offline/online resources	Market research
IT support	Feasibility (pilot testing)
Language support	Qualified e-learning course designer
EVALUATION	Partnership for deliver of practical components
Measure teaching effectiveness	Staff willingness to learn new system
Online test/quizzes	Online payment system
Learn from past performance	Careful administration of exam procedures
ETHICAL	Long term plan
Consideration for disabled students	INSTITUTIONAL-ACADEMIC AFFAIRS
Student's native language	Time allowance to prepare and run unit
Specified standard of behaviour	Student: staff ratio
Protection of students' details and privacy	Course materials prepared in advanced
Intellectual property rights	Lecturer's readiness to read and answer e-mail
TECHNOLOGICAL	Quality of online learning/accreditation
Slow Internet connection	INSTITUTIONAL-STUDENT SERVICES
System reliability and availability	Library facilities/support
System backup procedures	Offline/online orientation facilities

Table 2: Identified factors arranged under the modified Khan's e-learning framework

Conclusion

This paper outlined a study that investigates the key factors that are considered to be essential in order to enable the delivery of a postgraduate course in a fully online e-learning mode. The technique employed was a three-round Delphi Technique, which has been modified in the course of this study. The results presented in Table 2 were the identified key factors by the four perspectives: management staff, IT personnel, academics and students. This study found that there were huge differences between the different perspectives on what should be considered as priority factors. This implies that the different groups of participants have different perceptions. These differences are as expected given the various participants of different roles and responsibilities, which may have reflected their own expectations. However, this may also imply a lack of communication or misunderstanding with one another. Despite these differences, the factors raised by the four categories of participants have provided a much richer picture of what is really required for this kind of learning and teaching mode.

Limitations of this study

There are many limitations about this study, they include small sample size; the knowledge of the participants, who are not considered as expert in the field of e-learning; and the fact that the third and fourth rounds of the study were combined due to time constraints and low response rate. In addition, the way the factors were filtered was done through the possible bias of the researchers. The authors acknowledge that these limitations may have affected the validity of the result reported.

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