Analyzing Theoretical Approaches and Their Implications to the Development of Distance Learning Courses Research Project at Sultan Qaboos University

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Abstract

The purpose of this analytical article is to describe the development of Distance Learning For Common Courses Research Project at the Omani Sultan Qaboos University (SQU); analysing literary evidence of the possibility of offering distance learning (DL) courses as a feasible option to the physical classroom learning. Omani educational system is faced with the continuous annual growth in students' number due to the ever-increasing enrollment. This has its implications to the issue of Omani higher education cost-efficiency considering the decrease in state fund. The article brings in the recommendation that Omani educational institutions integrate the use of DL technologies with traditional classroom courses. DL programmes could be targeted to on-campus regular students. Students would enroll in a combination of multimedia based learning courses and traditional lecture based courses. By making use of DL, Omani educational institutions can offer quality education to cope with the growth in enrollment. Courses can be offered in a multimedia and traditional formats, which will help diminish the impact of the facility restrictions.

Abstrak

Artikel yang analitis ini ialah untuk menperihalkan perkembangan Projek Penyelidikan Pendidikan Jarak Jauh untuk Kursus-kursus Umum di Universiti Sultan Qaboos; menganalisis bukti penulisan dalam kemungkinan menawarkan kursus-kursus pendidikan jarak jauh sebagai suatu pilihan yang dapat dilaksanakan berbanding pengajaran di bilik darjah. Sistem pendidikan Oman kini menghadapi perkembangan berterusan dalam bilangan pelajar berdasarkan pendaftaran yang kian bertambah. Ini memberi suatu implikasi terhadap pertimbangan keberkesanan kos dalam pendidikan tinggi Oman memandangkan dana negeri yang berkurangan. Artkel ini mengutarakan syor agar institusi

pendidikan Oman mengintegrasikan kegunaan teknologi pendidikan jarak jauh bersama kursus-kursus tradisional di bilik darjah. Program-program pendidikan jarak jauh dapat ditujukan kepada para pelajar di kampus. Pelajar dapat mendaftar suatu kombinasi kursus pembelajaran berasaskan multimedia dan kursus-kursus berasaskan kuliah tradisional. Dengan menggunakan pendidikan jarak jauh, institusi pendidikan Oman dapat menawarkan pendidikan berkualiti bagi menampung pertumbuhan dalam pendaftaran. Kursus-kursus juga dapat ditawarkan dalam format multimedia dan tradisional yang akan menyusutkan impak kekangan kemudahan.

Introduction

Research findings show that there is an awareness among Omani higher education (HE) instructors to expand on new DL and digital multimedia technologies and that their perceived values of the technology are tangible (Al Musawi and Al Hashmi, 2004). However, the Omani concern for comparability of standards with the traditional system is a genuine one which must be attended to before DL can be developed, disseminated and diffused into higher education on a large scale (Al Musawi and Akinyemi, 2002). This addresses one of the most important questions faces the implementation of DL: the question of quality.

DL quality issue need to be resolve as the continuing rapid growth in students' number graduated from Omani secondary schools poses major strategic challenges for the higher education system. Some of these challenges include; social demands for higher education equal opportunity, education costs and expenditures, and the quality of educational provision. Using educational delivery modes such as DL to meet these challenges is one alternative provided that its quality is assured. It becomes obvious that as the number of students enrolled increases, the need to offer additional resources and facilities increases too. Taking in consideration the economic constraints, and in order to reduce the need for additional resources, common courses could be offered as DL courses in addition to the traditional education.

Using this system, a student may have a mixture of in-class and off-campus learning processes during the semester. By establishing DL

courses, Omani HE institutions can accommodate the increased enrollment without constructing additional classrooms and support services. But it is researchers' to provide the decision makers with answers to the DL quality question. In this context comes the Development of Distance Learning for Common Courses Research Project (DLCC) at the Omani SQU to set the stage for a longitudinal project that attempts to examine the possibility of offering distance learning courses as a feasible alternative to the physical classroom learning within the Omani HE institutions. However, DLCC project's common courses are to be offered to partially supplement the traditional classroom instruction, not replace it.

Before describing the DLCC research project, a literary evidence of issues related to the field of DL is reviewed. The aim of this review is to establish a theoretical basis of DL rationale, importance, criteria, and mechanisms adapted to the project requirements. This does not only support the DLCC in theory but also help to guide the project implementation in practice.

In specific, this literature review addresses the following questions:

1. What is a standard definition of DL?
2. What are DL characteristics in comparison to traditional education?
3. How effective is DL?
4. How could DL be strategically and technically planned, developed, administered, implemented, and evaluated?
5. What are DL multimedia course development criteria?
6. What implications does the review provide to DLCC project?

The Concept of Distance Learning

Available research has a propensity to examine the technologies and methods applied in the development of DL courses. There is some research that looks at the effectiveness of DL applications. Other investigates the implementation and evaluation parts of the field linked to staffing and training issues.

• Definition
It describes the interactive transfer of academic subject from a central instructional place to a remote location. The communication process could be in one or two direction. Student interaction is typically enabled

synchronously by a standard voice telephone and/or live internet broadcast; or asynchronously by a fax, bulletin board and/or CD; or combination of synchronous/asynchronous devices and techniques. The main concept of DL delivery of information is embedded in teaching and learning in which faculty and students are separated by space and/or time. Carter (2001) explained that the process of DL has been defined as providing a structured learning environment that involves the separation of parties over distance and/or time. For the DLCC project, DL is defined as university common courses delivered to regular students via computer multimedia and e-mail technologies to be used in their off-campus study as self-learning materials.

• Comparison To Traditional Education

Daniel (1996) states that DL is "a component of the wider enterprise of education and training". By this, one can conclude that DL is only part of the whole picture, it is not a "separate" system of educational delivery. However, the concept of this system is recently developed by the mechanisms involved in the delivery process. These include, but not confined to, the separation of instructor and learner, and the use of technology as a mean of communication. Moreover, the technology advances allow educators to eliminate traditional physical facilities requirements and class size limits. As explicate by Moore and Kearsley (1996), this system is not a series of separate entities but of interrelated components that function together with support of organizational and administrative arrangements. In comparison to traditional face-to-face classroom teaching, Khan (2005) stated that DL "can be different from traditional classroom instruction because traditional classrooms are space bound and treats learning pretty much as a closed system… bound by their four walls involving only the thoughts of the instructor, the textbook writer and occasional student comments. Classroom courses are also closed in the sense that they are limited to only those students who can physically come to the location". In DLCC project, regular university students are asked to take their common courses' learning material, in off-campus multimedia formats, to study them on their own pace at any time and place. This gives the student the opportunity to learn in a flexible and open delivery modes.

• Effectiveness

Most of are experimental; comparing the achievement tests results of the studies on the effectiseress of DC students of both DL and traditional classes (Souder, 1993). Many studies have conclude that no statistical significance was observed in terms of achievement between the two groups of students (Card & Horton, 2000; English, et. al 2000; Hersh, et. al, 2001; Bui and Sankaran, 2001). In practice, research shows that many universities have found accrediting bodies suspicious of DL courses and degrees (Bold, 2005). This research phenomenon was overwhelming to the extent it was called the "No Significance Syndrome". Burnham and Wilkes (1991), in the early nineties of the last century, conclude the DL effectiveness argument stating that "good distance teaching practices are fundamentally identical to good traditional teaching practices, and those factors which influence good instruction may be generally universal across different environments and populations". In the writers opinion, what matters is not to the technology form since it is only a vehicle. What really makes DL effective is the design of the learning materials, the support provided to the student, and the comprehensive evaluation of the system. The DLCC project structure provides for these three major components of effectives in addition to many others.

Issues of Distance Learning

The following sections discuss issues of: planning, designing, administering, implementing, and evaluating in DL system. Literature shows many topics to cover in these areas and those are classified into their main relevant categories.

• Strategic Planning

There are eight areas which a strategic plan of DL should target. These are: leadership and organization; goals and objectives; courses, programs, delivery methods, and services; customers; instructional development, technical support, and faculty issues; finances; quality assurance and improvement; and partnerships (Adams & Seagren, 2004). Smith (1998) proposes five objectives for a DL strategic planning: improving access, expanding an institution's geographic reach, improving educational quality, increasing efficiency for institutions and for students, and achieving customer satisfaction. Fornaciari, et. al (1999) propose four DL strategies based on an institution's "size, reputation, and cost". In specific,

components that should be factored into the decision of DL delivery include: technology, maintenance, infrastructure, production, support and personnel. Although some universities involve in the process of writing formal DL strategies (Hache, 1998; Berge & Schrum, 1998), others develop it through faculty initiatives (Adams, 2003). The case at SQU is a combination of both: a administrative-experimental initiative approach where the faculty, supported by the university administration, design and experiment their initiatives. DLCC project is the best example on this approach. The project is indeed a financed one by the 'Annual Research Grant of His Majesty the Sultan of Oman'. It was first proposed to the AVP Office for Scientific Research. Then, it was critically reviewed by an international team of reviewers. Finally, it was selected among other projects to receive the grant. It is expected that the project results pave the way to construct a strategic plan for DL courses provision at the university and other Omani HE institutions. Implications of research reviewed and to be reviewed need to be considered in contextualising the Omani strategy in this field.

• Course Development Criteria
The criteria for a DL course development are based in principle on the quality of course design. They focus on: learning experiences that have a clear purpose with well-defined objectives and outcomes; assignments that are well-designed and are incorporated to facilitate interactive learning, course materials that goes beyond knowledge transmission to knowledge creation and critical thinking; learning process that makes appropriate use of the multimedia packages; clear mechanisms and guidelines for interaction between the student and the instructor through e-communication; course materials that emphasize time on task; feedback that is promptly provided, effective procedures that are in place for acquiring access to appropriate resources to support the course; course materials that respect diversity, varied talents, and different learning styles (Wood, et al., 2004). Ferguson and Wijekumar (2000) report that development of DL courses involves three processes: outcome and course content analysis, course design, and pilot testing. The outcomes and course content analysis should be based on student preferences and learning styles, in addition to recommendations from the subject matter experts. Once content and audience is selected, the method of delivery should be defined. In the design process, courses should be developed that focus on cognitive learning theories. The final process is pilot testing.

Each course developed should be tested in the format it was designed to operate in. Testing should include both content and delivery systems.

• Course Multimedia Packages
In DLCC, the main AV instructional format is multimedia packages supported by e-communication, wherever possible. This type of DL format is selected because:

1. it incorporates all media formats;
2. its design capabilities of interactivity are far advanced;
3. it provides the students with self-learning tools; and,
4. students accessibility in remote areas to the internet is not always possible.

The quality of instructional visuals produced for a medium is the single most important parameter which affects the quality of learning. Research show that the application of the basic tenets of educational psychology, learner modeling and above all, common sense can enhance the effectiveness of instruction (Kumar, 1998). It is also observed that general principles for good multimedia design are common for all audiovisuals and the same are valid for different modes of teaching-learning, e.g., classroom teaching, distance communication and self learning. The package should provide a pedagogical perspective derived from contemporary research on the design of multimedia. It should also encourage students' creativity and innovation by providing them with animated, interactive, and pictorial examples and learning resources throughout the content design alongside the proposed guidelines of using the package. The package should allow for instant, yet continuous, informative, exciting and useful feedback.

• Implementation Issues
There are several issues that could arise during DL implementation phase, as follows:

1. On the financial level, the establishment of a DL program does involve some costs (Brzoska and Threlkeld, 1994) on the short run. But these costs are justifiable on the long run and would be directly proportional to student enrollment and use. DL system in general could benefit institutions by avoiding the cost of acquiring new facilities.

2. On the administrative/technical level, universities should have the technology, infrastructure, support and personnel to accommodate the development of DL courses. At SQU, these requirements are mostly available. In addition, the DLCC multimedia packages are to be designed, developed, and produced using an advanced workstation bought for this purpose.

3. On the academic level, there exist different levels of computer skills and abilities among faculty members and students. The levels of computer and technology efficiency in most universities are inversely correlated with faculty age and academic experience (Lan, 2001). In DLCC, this issue is resolved by having a training multimedia laboratory where all staff involved are to be trained.

• Instructional/Academic Issues

On both the instructional and academic levels, the following issues are reviewed:

1. Courses selected for DL should be selected based on learning objectives, teching methods, and course content. However, for the purpose of DLCC research project and the needs of SQU, selection criteria are broadened. Two university and college requirements are selected based on the huge numbers and resources invested in them. As mentioned earlier, the objective of this exercise is to study the possibility of offering these core courses without the need for additional resources on the part of the university.

2. DL courses need students and instructors to engage in discussions. The communication process required for the selected DL courses is no different from that of traditional classes. This requirement is well addressed in different stages of the DLCC project. In addition to traditional classroom interaction and office tuition, e-communication is used wherever possible.

3. DL system require motivated instructors that can deal with its delivery modes. Schifter (2000) identify factors that motivate faculty participation in DL system. The top three motivating factors for faculty are: (1) personal motivation to use technology, (2) opportunities to develop new ideas, and (3) opportunities to improve

teaching. In DLCC, the researchers choose common courses in consultation enthusiastic and technology-oriented instructors requesting them to involve in the field work.

• Evaluation and Total Quality Management
The key to the success of a DL course is quality. The DLCC research project should develop its complete quality-measuring instruments, or rubrics, and application forms.

These forms should include the evaluation of course syllabi, material development on multimedia packages, and the feedback provided to the students. Design, readability and interactivity are main factors for evaluation. Faculty may be asked to support the multimedia packages by producing printed materials or a word-processed document appropriate for use on a compute. Evaluation forms should also evaluate issues related to DL delivery modes such as: role and responsibility of the instructors, along with training procedures, class size limits, preparation time, copyright policies, and ownership of course material. It may be decided that instructors to receive compensation for distance courses, and their courses would have to be evaluated against standards of best practice through a peer review process.

One major issue in TQM of a DL course is assessment. In this field, tests should take place in a proctored laboratory or room in the physical presence of both the students and their instructor to insure accurate measurement of student achievements and adherence to SQU regulations. Testing high-level cognitive skills is an important item, but other forms of assessment, such as essays, can be used to test more practical skills, such as the ability to structure a coherent argument. The student's scores are used to assist in improving the student's learning, often by identifying weaknesses in the student's knowledge and understanding of a given area or by helping them to identify and correct misconceptions. Instructors can also make use of the results obtained to help them improve their teaching by identifying areas that students have found difficult to understand.

To this, a theoretical framework is given. The following sections describe the nature, objectives, rationale, and steps of implementation of DLCC.

Development of Distance Learning for Common Courses Research Project at SQU

Development of DL for Common Courses (DLCC) Research Project is set to develop DL material and interactive tutorial for common courses undertaken by all SQU students. These common courses are essential courses, taken by each SQU student. The intended courses are two: a university requirement course, and a college requirement course. DL for Common Courses (DLCC) project allow students to take the courses off-campus via self-learning multimedia packages on compact disc (CD) handed to the students at the beginning of the semester. This should be enhanced by e-communication, wherever appropriate, throughout the semester.

• DLCC Project Objectives
The objectives of the project can be summarised in the following points

1. Create, design and develop DL materials for common courses at SQU.
2. Implement and evaluate the effectiveness of DL method of instruction.
3. Develop DL laboratory for research and development in the area of DL.
4. Develop a DL model for higher education systems in Oman.
5. Conduct the following research objectives.

    (a) Compare, evaluate and investigate the impact of DL method of instruction from the achievement of SQU students.
    (b) Investigate DL needs, features and components in the Omani higher education system.
    (c) Investigate the cost effectiveness and economic aspects of the project.
    (d) Investigate the effectiveness of DL acquisition of practical skills.
    (e) Study the Quality of Service improvements of multimedia applications.

• DLCC Project Advantages
DLCC research project provides many advantages for academic faculties, SQU students, university administration and the country.

(a) Advantages to Faculty
- It reduces problems faced by academic staff teaching over-registered courses and reduces administration work.
- It saves academic staff valuable time that could be spent on research and gives them the required time to improve quality of teaching.

(b) Advantages for SQU students
- It allows late students to graduate on-time since these courses can be taken from home
- It solves problems like limited number of sections in courses, high number of students in one section and courses timetable collisions.
- Students who are not allowed to take summer courses can now graduate on time or earlier than what they are supposed to do.

(c) Advantages to University
- It reduces a lot of complexities generated by highly populated courses like assigning many sections and classrooms to accommodate students.
- Effective usage of existing IT infrastructure
- Eventually, it will open the door for students to take an entire semester away from the University so it will reduce the number of semesters the students spends on-campus and reduced the expenses associated with that.
- It also reduces number of staff involved in these courses.

(d) Advantages to the country
- The successful implementation of DL education at the University will represent a model that will be followed by the rest of colleges and Omani HE institutions in the country.
- In the long-term, the success of DL education in the country will reflect on a positive image in the region and might as well be a model that regional institutions will follow.
- Workshops and seminars about the advantages and implementation issues of DL to be conducted to national/international private/ public colleges and universities
- The project builds a know-how experience and will establish a foundation of DL education in the country.

- *DLCC Project Methodology, Implementation and Evaluation*

Due to the complexity and magnitude of this research project, a series of studies are to be conducted to assess the overall value of the project. The effectiveness and utility of different features of DL environments will be investigated. Accordingly, a variety of qualitative and experimental research methods are to be used depending on the nature of the dependent and independent variables being investigated. The project, thus, is evaluated at three different levels:

1. Level one: Faculty and students' reactions and attitudes towards technology-based distance learning environments.
2. Level two: Students' performance in their respective subject areas
3. Level three: Cost effectiveness

(a) Population and sample

The population of DLCC research project consists of all students enrolled in the proposed courses, and all faculty members involved in the delivery of these courses. A number of random samples needs to be assigned to experimental and control groups for each course.

(b) Research Instruments

The research instrument includes:
- Perception and attitude questionnaires to both faculty and students.
- Achievement tests for all distance learning courses included in the project.
- Student performance tracking tools.
- Value added indicators for cost effectiveness.

These instruments will be validated by a number of experts and specialists, and piloted on equivalent sample from the population of the studies.

(c) Implementation Procedures

The improvement of the courses will be based on introduction of computer based multimedia training. SQU already offers multimedia production and training services through the Multimedia Department service provided by the Center for Educational Technology at the university. This service will be utilized. HTML programming will be utilized to allow parts or the entire courses to be designed on multimedia packages allowing a wider benefit to students at remote areas. The local version of this work include significant video and

sound clippings, which requires being in compact discs. The SQU students computer laboratories are to be improved to include multimedia capabilities and connection to the Local Area Network and Internet. To allow a student activity evaluation these multimedia based learning courses also include interactive instructional tasks, quizzes, and assignments forms which can be fed back to the instructor via e-communication.

Students register for these courses are given a self-learning multimedia CD package that contains all materials related to the course. They attend the first lecture which include an introduction to the course and a demonstration on how to use the CD. Students study at their convenient timings and prepare for quizzes, exams and assignments. They may attend some classes or attend office tuition in coordination with their course instructor. They can also communicate with the instructor through e-mail, when possible. Exams and other major assignments should be taken in a proctored laboratory or room so as to insure accurate measurement of student achievements and adherence to SQU regulations.

The work undertaken is performed using the following methods:

1. Instructional design of the targeted DL courses to identify objectives, role of learners and instructors, framework of instructional material, appropriate interaction methods between learners and instructors, appropriate assignments and evaluation tools as well as other teaching and learning aspects as related to the use of DL delivery methods.
2. Development of teaching material
   - Text
   - Pictures
   - Video clips
   - Sound Clips
3. Development of multimedia clips to present the above material.
4. Incorporation to multimedia CD
   - Animation
   - Answer form (Via database forms)
5. Conducting a series of studies to address the research objectives.

- *Computer Laboratories Facilities*

The present computer facilities at the university are networked and are served by several servers running last Windows versions. The computer laboratories has many PC networked with Internet Connections. These facilities are adequate for such utilization and in most cases offer more than what is required for web based training.

Conclusions

The purpose of this analytical paper is to describe the Development of Distance Learning For Common Courses (DLCC) Research Project at the Omani Sultan Qaboos University. An in-depth analysis of literature is conducted with the intention of adapting the (DLCC) procedures in scope of implications drawn from the literary evidence. Many research findings are incorporated and reflected into the project structure as deemed appropriate throughout the paper.

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