Roles of Administrators in Ensuring the Quality of Online Programs

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Abstract: Roles of administrators are often overlooked when discussing the quality of online education. Administrators have long assumed the pivotal influence on school policies, faculty morale, and learning atmosphere. This paper will examine the challenges administrators face and their new roles of quality assurance for online education. Recommendations will also be made for improving the quality and success of online programs.

Keywords: Online Programs, Administrators, Quality.

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1. Introduction

With the prevalence of online learning, online programs are rapidly expanding. Higher education administrators are facing the challenges of increasing student enrollments, growing global opportunities, implementing new technologies, responding to workplace demands, and at the same time, maintaining affordability. Yet how to ensure the quality of online programs has been a major concern for educators and policy makers. It is common to hear arguments that technology has been used as a panacea to correct financial problems of institutions rather than a valid teaching method (Hensrud, 2001). Online course delivery is often viewed by "administrators as a 'cash cow' venue" (Brown & Green, 2003, p. 148). Administrators should realize that when the quality of online education declines, the online programs will no longer be a "cash cow" venue. However, most of the administrators are not aware of the impact they have on creating a positive culture and changes in online programs (Dooley & Murphrey, 2000; Robinson, 2000). Therefore, it is crucial for administrators to realize the roles they play in ensuring the quality of online programs.

It is necessary to define quality when discussing it in relation to online programs. The American Society for Quality (2009) identifies four dimensions of quality in education: accountability, curricular alignment, assessment, and student satisfaction. Bourne and Moore (2004) suggested four elements of quality online education. They are student satisfaction and student success, learning effectiveness, blended environments, and assessment. Frydenberg (2002) identified nine quality standards in e-learning. The first and foremost standard is executive commitment. Others include technological infrastructure, student services, design and development, instruction and instructor services, program delivery, financial health, legal and regulatory requirements, and program evaluation. However defined, all of these quality dimensions, elements, or standards are directly or indirectly a component of an administrator's responsibility. Therefore, to ensure an online program's quality, this paper is suggesting that an administrator should first be an organized planner and manager to strategically launch and manage an online program, then an effective motivator to encourage faculty to teach online, and finally a strong supporter for faculty and students.

2. Administrators as Planners and Managers

Administrators have distinctive roles and obligations in facilitating quality learning (Alley, 2001). To ensure the quality of online education, administrators should take active roles in planning and managing online programs. According to McKenzie, Ozkan, and Layton (2005), to make distance education program successful, areas in planning, implementation, and quality control are important for administrators to consider. When planning and managing online programs, administrators should use techniques aligned with quality online learning. According to Alley (2001), specific techniques are: (1) encourage faculty to design web courses for construct knowledge, not just transmission of information; (2) require faculty to develop more detailed course syllabi to include timetables, learning tasks, and learning outcomes; (3) plan for online and remote assessment sites for formative and summative assessments; (4) accommodate faculty's different teaching styles and students' different learning styles in online environments; and (5) promote social interaction between faculty and students. Levy (2003) suggested six considerations when planning online programs in higher education. They are: (1) visions and plans; (2) curriculum; (3) staff training and support; (4) student services; (5) student training and support; and (6) copyright and intellectual property.

Recruiting qualified faculty or instructors to teach online courses is a critical step in planning and managing online programs. The Western Cooperative for Educational Telecommunications (WCET) published *The Principles of Good Practice for Electronically Offered Academic Degree and Certificate Programs* in 1997, in which it emphasized that electronically offered programs should be taught by qualified faculty (WCET, 1997). Furthermore, Husmann and Miller (2001) asserted that because administrators' perceptions on the quality of online programs are based almost exclusively on the performance of faculty, the recruitment of qualified faculty to teach online courses was prudent.

Rahman (2001) suggested a Five C model that administrators may use in recruiting faculty to teach online courses. The Five C model is actually a three-stage model. Stage one is Communication, where the administrators communicate with prospective faculty regarding the principles, practices, and values of the online education. Stage two is Convince, where the administrators convince the faculty members to gain their support.

Stage two contains two modes, the Conciliatory mode and Contending mode, both could be used when persuading faculty. Stage three is Consummating, where administrators make sure the online environment was built smoothly for the faculty member. The author also suggests four faculty sources to recruit from:

"1. Full-time professors

2. Local area adjuncts

3. Wide area adjuncts

4. Well qualified professors from other universities nationwide" (2005, p. 6).

3. Administrators as Motivators

Administrators should be motivators in ensuring the quality of online programs. They should motivate faculty to teach online and students to learn online. Administrators can motivate faculty, especially senior faculty, to teach online courses in many ways. According to Giannoni and Tesone (2003), some approaches could be intrinsic or personal rewards, such as tenure and promotion, workload adjustment, or reduction in duties and increase in pay. Dooley and Murphrey's (2000) study indicated that tenure and promotion policies were considered very important for faculty to embrace online education.

Cuellar (2002) suggested that faculty who are willing to teach online should be provided professional development opportunities in order for them to learn not only the "technological know how, but also education on how to develop courses on strategies to promote interactive online learning" (p. 11). Giannoni and Tesone (2003) conducted a study that determined motivational factors that influenced participation of senior faculty in online learning programs. They found faculty rated release time, personal satisfaction, e-teaching development, technical support for faculty, and professional prestige as motivational factors that influenced their participation in online learning programs. Administrators should bear these considerations in mind when approaching faculty to develop online educational programs.

Administrators should understand faculty needs and concerns in order to motivate faculty to teach online courses. Faculty's concerns teaching online mostly centered on heavy workload, lack of institutional support, inadequate compensation, incentive structures, loss of autonomy and control of the curriculum, lack of technical training and support, changing roles in online environment, time requirement and time taken from research (Berge, Muilenburg & Haneghan, 2002; Clark, 1993; Levy, 2003; Rockwell et al, 1999; Yang & Cornelius, 2005).

McKenzie, Mims, Bennett, and Waugh (2000) surveyed faculty needs and concerns at State University of West Georgia. The authors found that faculty preferred receiving assistance from the university and administrators in delivering online courses and various training sessions. The study reported faculty's needs for consistent technical support, more time to design and deliver online courses, more incentives (i.e., laptop, student assistants, merit pays), and helpful administrative support services. The study revealed that faculty hoped administrators would limit online class enrollments, fix

learning management system problems in a timely manner, and respect their wishes to teach online.

4. Administrators as Supporters

Administrators should provide and arrange administrative and technical support for both faculty and students in order to offer quality online programs. Many researchers suggested that providing support, such as training, administrative, monetary, and promotional, is essential for administrators to ensure the quality of online education (McKenzie et al, 2000; Husmann & Miller, 2001; Levy, 2003; Giannoni & Tesone, 2003). As Berge (1998) has argued, online teaching and learning will definitely fail without strong administrative support of programs, training, faculty and students. Moreover, Mayes and Banks (1998) concluded three factors combined to maintain quality and integrity of open learning courses: (1) common, structured course materials; (2) open assessment using a competency-based methodology; and (3) an extensive support and monitoring network. With strong support from administrators, faculty, and students will be more willing to teach and learn online.

Faculty needs support in a number of areas when teaching online. First is the support for teaching online. Online teaching support includes training to teach online, such as supplying concrete examples and sample online courses, use of online technology, access to technical resources, and technical issue support. Course-creation support for faculty is needed, such as instructional design assistance; intellectual property, copyright, technological and media creation; and team-based course creation (Shelton & Saltsman, 2005). Additionally, detailed policies and procedures for faculty are helpful. A useful tool would be an online faculty handbook with summarized policy, typical practices, and common procedures (Shelton & Saltsman).

Administrators should be aware that student support needs to be provided differently than faculty support. Learners must have support for academic advising or counseling, library services, training on equipment and software, financial aid, testing, access to instructional resources, and technology requirements (Simonson & Bauck, 2003). Dooley, Lindner, and Dooley (2005) indicated that student support services may vary depending on the needs of primary distance-source learners and secondary distance-source learners. The primary distance-source learners are adult learners with families or work. Accessibility is the primary motivator for them to choose online programs rather than content or reputation of the institution offering the instruction, because they prefer not to travel. The secondary distance-source learners are usually on campus and choose online learning for its convenience and flexibility in scheduling. They usually have been exposed to technology since their early years of primary school.

The Institute of Higher Education Policy (2000) proposed four quality benchmarks regarding student support services. They are (1) information about programs (i.e., admission requirements, tuition and fees, books and supplies, technical and proctoring requirements); (2) hands-on training and information on how to access library database and services; (3) technical assistance; (4) designated student service personnel and a system to address student complaints. Administrators need to understand that the quality of the online programs can only be ensured when the quality of online teaching and learning is assured.

5. Conclusion

A quality online program requires accountability and quality assurance in many aspects. The Council of Higher Education Accreditation (2002) defined quality assurance in distance learning as "the means by which the institutions or providers set their program goals and measure results against those goals" (p. vi). To measure the quality of their online programs, administrators may consider following the best practices, guidelines, or quality benchmarks published by accreditation bodies or agencies. The Institute for Higher Education Policy (IHEP, 2000) conducted a study addressing quality benchmarks for Internet-based distance education, and published 24 benchmarks for measuring quality Internet-based learning. The 24 benchmarks are divided into seven categories:

1. institutional support
2. course development
3. teaching/learning
4. course structure
5. student support
6. faculty support
7. evaluation and assessment (p. 2-3)

The Higher Learning Commission (2007) suggests some measurement methods include, but not limited to: documenting students' academic achievements in courses, keeping records of student retention and graduation rate, comparing students' performance to the intended program outcomes, monitoring faculty and students' satisfaction, measuring students' competence especially using nationwide standard assessments as a comparing base, and maintaining the cost effectiveness of the program. The U.S. Department of Education (2006) recommends many proven practices for evaluation and assessment of an online program, such as interviewing faculty on how they used the course evaluation data to improve their teaching and how these changes affect students' performance; reviewing and revising the courses periodically; comparing the outcomes for programs offered both online and face-to-face; and documenting the evidence of how the program is improved.

The roles of administrators can never be underestimated. They are the most important factors in success of online education (Brooks, 2003). The U.S. Department of Education (2006) asserted that distance education programs are unlikely to succeed, sustain, and grow without executives' commitment. Quality online programs are maintained at high levels when administrators realize their roles in the quality assurance process. In short, to ensure quality online programs, administrators must be planners, motivators, promoters, and supporters. When administrators understand clearly what their roles are and the impact their contribution has on the quality of online educational programs, they can begin to take major steps toward achieving quality online education for students.

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The Leadership Roles of Distance Learning Administrators (DLAs) in Increasing Educational Value and Quality Perceptions

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Abstract

This paper examines the leadership roles of distance learning administrators (DLAs) in light of the demand and need for value and quality in educational distance learning programs and schools. The author explores the development of distance learning using available and emerging technologies in relation to increased demand for education, training, skills, and certification in the global school economy of the 21st century. The paper brings to light the challenge that the value and quality debate poses as competition among colleges and universities increases and the labor market demands more talented knowledge workers in a space where competition affects professional prospects and graduate success. After examining the development and problems and challenges of distance education, the author looks at the critical leadership roles of DLAs using ideals of leadership effectiveness as communicated by a survey of the literature. Using Mintzberg's theory of informational, interpersonal, and decisional managerial roles and activities, the author identifies the activities across which distance learning administrators could display exemplary leadership functions through sharing their vision, modeling the way, challenging the process, enabling others to act and encouraging and motivating the development and delivery of value and quality teaching and learning practices to capitalize on core and distinct competencies to build lasting competitive advantage.

Introduction

Despite the numerous and volatile changes we have undergone as a society and civilization, education still remains the most powerful force for individual and collective transformation. Change dominates our world and education is a major vehicle for initiating, managing, and sustaining or stabilizing our environments affected by change. It is through educational value that we develop the understanding and knowledge to effectively craft strategies for leading change (Kotter, 1996). Change exhibits itself as both a planned and unplanned phenomenon (Burke, 2002), and the many factors fueling the change process originate from uncontrollable factors and our attempts to create, improve, and manage progress as individuals and society. Most profound among the factors propelling change, is the impact of technology to modify values and cultures, but more so, the structure and pedagogical approaches or the teaching and learning processes we use to transmit the ideals, norms, and practices we embrace from one generation, era, and place to the next.

Humankind's inclination toward both inner mental-conscious and external exploration has pushed both mind and body toward a more universal perspective and broader view of things. This is especially true in a world becoming increasingly globalized in every sense of the word. This inclination toward a broader worldview, and the need for greater and more knowledge to facilitate survival amidst competition and change, has led to increased demand for education by people and nations in all corners across the globe. In turn, this need and the availability and use of information and communication systems made available through constantly increasing technologies have facilitated the increased use of CML to support teaching and learning, especially via distance educational opportunities.

CML refers to learning that occurs when an individual interactively learns (formally or informally, synchronously or asynchronously) about material via computer means where the learning materials and pedagogy are developed to take advantage of the available technologies (The Journal of Educators Online [JEO], (2010). CML includes distance, online, electronic, virtual, distributed, blended and mobile learning. Many online classrooms use a variety of technological tools and strategies. Distance learning is a common and most popular form of CLM and around which major educational programs, corporations, and institutions are built today. Most distance learning institutions make use of a virtual learning environment (VLE). A VLE is "a virtual learning environment (VLE) is a set of teaching and learning tools designed to enhance a student's learning experience by including computers and the Internet in the learning process" (TechTarget.com, 2008, p. 1). Dillenbourg (2000) defines a VLE as "a designed information space" (p. 3). Some examples of VLEs that facilitate teaching and learning in distance education programs and courses include Blackboard, WebCT, Lotus LearningSpace, Moodle, and COSE, with more and better being developed every day to improve value and quality of the teaching and leaning interactions in distance learning institutions and programs.

Distance Education in the Global Economy

We are living in a school economy, asserts McFarlane (2010a), and as, such everyone is seeking some form of training and education to improve skills and prospects for employment. Furthermore, education is now more essential for people to realize their dreams and survive, especially in a global society where education is no longer an option, but a must to enter the highly competitive labor market. Distance learning has become a major force by which individuals all over the world are acquiring the necessary training, skills, and education required to enter the job market. This has led to an unprecedented growth in all aspects of the distance learning industry, from the number and types of schools to the variety of technology and programs being offered. This teaching and learning modality makes time and space the regulating variables between teachers and students located anywhere, yet interacting through powerful and speedy information and communication technology systems and processors.

Distance learning is an educational situation where the instructor and the students are separated by time, location, or both, and it can be either synchronous (real-time, instructor-led event in which all participants are virtually "in class" at the same time) or asynchronous (interaction between instructors and students occurs intermittently with a time delay) using a variety of distribution methods including technology (Freeman, 2010). Distance education makes use of technology in full or in part to facilitate the teaching and learning process. Traditionally, distance education took place using postal mail to deliver books, examinations, and other instructions to students in the form of homeschooling. Today, the term homeschooling is still used to some degree to define some form of distance education because students are able to acquire an education in the comfort of their homes. However, technology is being used to its maximum today by distance learning institutions to facilitate teaching and learning, unlike in the past where there were still limitations and the factor of "presence" was even less defined (McFarlane, 2011).

Distance education does not have to make use of technology to distribute learning and this is evident when we look back at the history of the early pioneers of 21st century distance education, including institutions such as the International Correspondence Schools (ICS) and Lifetime Career Schools (LCS) which provided secondary and vocational programs and training, and California Pacific University which was an early initiator in the provision of advanced degree programs, as well as several others which made use of postal mail for decades before the birth of online education and virtual schools (McFarlane, 2011). The virtual landscape for distance education is still rapidly changing with new technological tools and human innovation.

Distance learning has changed dramatically since the 1990s to become a dominant part of the landscape of the higher education global industry of the 21st century. Today we have mega-distance learning corporations, colleges, and universities operating on all continents and offering training, continuing education, and academic degree programs in various fields. As such, many distance learning institutions have emerged to become major players in education, some becoming complements, alternatives, and even replacements to the traditional or on-campus programs and schools or educational formats. Teaching and learning modes where teachers and students or educators and learners are separated by time, distance, and location have become the most convenient and fastest, "easiest" ways to meet the growing demands for degrees, education, certification, and training. Distance learning opportunities respond effectively to the demands of individuals in the fast-paced globally competitive world of the 21st

century. In this environment, administrators, teachers, and learners must attend to multiple tasks and responsibilities in personal and professional lives while providing and pursuing education. Despite the great convenience and benefits of distance learning opportunities, there are problems and challenges that DLAs must face in leading units, departments, and institutions offering distance education (McFarlane, 2011). The ability of distance learning administrators to effectively address these problems and challenges will significantly shape the future of online or virtual distance education.

Distance Learning Challenges and Problems

Similar to traditional educational administrators, DLAs or leaders must meet a variety of problems and challenges in ensuring the effective and efficient operation of distance learning schools. Valentine (2002) has identified five major problems and challenges to distance learning that administrators must deal with: quality of instruction, costs effectiveness, misuse of technology, role of technicians, and problems with equipment. One of the greatest and most complex of the problems and challenges faced by distance learning administrators is that of quality assurance in terms of the value and quality of distance learning programs. This mainly stems from the long-standing debate regarding traditional versus distance education programs and schools. The key problems-challenges among these five factors seem to be the quality of instruction, misuse of technology, and costs effectiveness, and distance learning administrators can follow several recommendations in order to deal effectively with these issues

Table 1: How DLAs Can Effectively Address Three Key Problems-Challenges

Key Problems-Challenges	Potential Solutions
Quality of Instruction	Develop and maintain rigorous quality assurance programs. Engage in research and planning for institutional effectiveness (research that focuses on service quality, instructional quality, students' perceptions of services, etc). Develop up-to-date and comparable curriculum and programs through benchmarking (emulate the best practices and market drivers in the distance education industry). Seek, obtain, and maintain approval by private or governmental quality assurance agencies – accreditation and appropriate professional and state licensure for your institution and its programs. Become part of professional and academic bodies and agencies in program and industry fields, for example: DETC, USDLA, EDLA, among others. Train and empower faculty and staff to effectively use technology and apply the highest service protocols in responding to and assist students. Apply the SERVQUAL indices (Service Quality indices - RATER (Reliability, Assurance, Tangibles Empathy, and Responsiveness - Zeithaml, Parasuraman & Berry 1990) to measure and improve service effectiveness across the board. Lead to build competitive advantage by focusing on what your institution or distance learning department does best rather than seeking to outdo competitors – foster development of core and distinct competencies.
Misuse of Technology	Develop and enforce a ***Code of Usage*** for technology for staff, faculty, and students. Insist on training instructors to use distance learning technology regardless of prior experience and have regularly scheduled training programs (Valentine, 2002). Hire creative and well-informed instructors (Greenberg, 1998) who are able to effective use technology while motivating students to learn. Implement sanctions for misuse of technology by staff, faculty, and students. Recognize the limit of technology and train instructors or faculty in "technology socialization" as a key factor in communication, feedback, responsiveness, and progress.
Cost Effectiveness	Determine the real costs versus desired costs of human capital and technology for program operational efficiency. Select the most costs effective software. Cost effective does not mean cheap, but refers to the ability of a software program to proficiently achieve teaching-learning interaction goals overtime while delivering quality without increasing costs in other areas. Make effective use of the virtual medium – technology and electronic library and materials to reduce costs for students, faculty, and institution – examples of such costs are textbook costs, costs of equipment, training and subscription costs. Seek to reduce costs associated with training technicians and instructors. Do not strive to model traditional or brick-and-mortar institutions in their structures and approaches as this will eliminate the natural cost advantages associated distance and virtual environments.

There are several other problems and challenges, including technology adaption and usage, provision of scholarship and remedial academic services, developing effective service protocol, addressing faculty and student issues that arise in the teaching-learning process, dealing with issues of accreditation and student placement, finance, among several other issues. All of these factors invariably affect what Valentine (2002) describes as "quality of instruction" (p. 1).

DLAs can best ensure quality of instruction by having the right people – instructional and technology experts, right technology, quality and well-designed and organized curriculum, appropriate materials – textbooks and other media sources. Accreditation and approval that focus on assessment and evaluation by external parties including private and state agencies usually guarantee some significant levels of quality. Thus, effective DLAs should be aware of this and make curriculum planning and quality assurance important factors. This is where a responsibility over institutional planning and effectiveness comes into play. Despite the virtual side of distance learning, administrators still need to carry out the managerial role of controlling and monitoring for standards, whether that standard is in reference to programs, curriculum, or instructors. They need to work hard, not only in obtaining, but also maintaining relevant state and agency approval for programs. This requires DLAs to keep abreast of new developments in the fields. This can be accomplished by being members of distance learning organizations and agencies such as the Distance Education and Training Council (DETC), United States Distance Learning Association (USDLA), European Distance Learning Association (EDLA), among others. Additionally, effective DLAs will view themselves as part of a global trend in education and seek to be actively visible and participating subscribers and members in conferences in the industry, and read and subscribe to academic and professional journals and magazines. Training and education are also important in dealing with these problems and challenges as DLAs further their knowledge of distance learning technologies and their leadership skills.

The quality issue has long plagued distance learning as a dominant factor for critiques. The issue of value and quality is especially important today when so many individuals are still questioning the value and quality of distance education programs and where schools, colleges, and universities are fighting aggressively in a contracting and overpopulated school economy to maintain their competitive edge. This is especially challenging as the nation and many educational stakeholders and policymakers call for higher standards to propel the nation to the forefront of the education arms race (Ladner, LeFevre, & Lips, 2010). According to Valentine (2002) "Much of the quality of instruction depends on the attitude of the administration and the instructor" (p. 1). Administrators are the first key to quality of instruction in distance learning settings because they are the leaders who are expected to set core standards; standards governing curriculum and instructors, as well as students' performance. Thus, distance learning administrators have an *instructional quality function* in which they should determine the factors that build and contribute to the quality and growth of instruction. In addition to these problems, Ham (2003) identifies several problems common to colleges and universities that also impact distance learning: rapid increases in tuition costs that outpace the growth of the economy and students' abilities to pay for a college education, the challenge of facing a new customer group consisting of older more consumer-savvy students, and competition from other colleges and universities, including enrollment issues.

In proving themselves to be exemplary leaders who are able to meet the challenge of 21st century leadership, DLAs must now model the way for educational value and quality that enables faculty and

students to meet their goals (Kouzes & Posner, 2003). This requires effective delivery of skills and training using appropriate technology and pedagogical approaches (Entz, 2006). As effective leaders, DLAs are expected to design, implement, and maintain both value and quality in distance teaching and learning programs. The call for higher standards and quality from various stakeholders and demands for increased accountability from educational leaders and institutions stemming from the need for and attempt at educational reform (McFarlane, 2010b; Hale, 1999) have also added pressure to DLAs to create value and quality at both the beginning and end-stage of instructional programs. Moreover, the competitive market for educational credentials, students' satisfaction, continuous governmental regulation and monitoring, criticisms from education watchdogs, increased number of institutions offering distance learning programs, accreditation diversity, competition and employment prospects relative to perceived degree value and quality - are demanding more and more from distance learning institutions and programs in terms of value and quality. Distance learning programs must be managed and led effectively by administrators with broad knowledge and understanding of the education industry and these regulating variables.

The need to develop and maintain competitive advantage is another factor which demands that DLAs must focus on value and quality in educational service provision. According to Investopedia (2010), competitive advantage refers to an advantage that a firm has over its competitors. Competitive advantage allows firms to generate greater sales or margins and/or retain more customers than their competitors. Different types of competitive advantages exist. These include the firm's cost structure, product offerings, distribution network and customer support, among others. In a distance learning unit or institution there are many factors from which competitive advantage could potentially arise and administrators must be aware of these factors and how to effectively capitalize upon the strengths of each to create opportunities for their institutions. For example, competitive advantage in a distance learning institution could potentially arise from program structure, cost or tuition – typically lower costs than competitors, quality of program in terms of contents and structure, value of program in terms of how well others perceive its value, quality and qualifications of faculty, technology used and applied such as the type of VLE, program duration and completion time, program delivery methods and success in job search assistance or placement, among other factors. DLAs must strive to identify and build competitive advantage around any of these factors that prove to be core or distinct competencies for their units, departments, or institutions. Core competencies are the combination of pooled knowledge and technical capacities that allow a business to be competitive in the marketplace (de Kluyver & Pearce II, 2009; Alexander, 2010). Theoretically, a core competency should allow a company to expand into new end markets as well as provide a significant benefit to customers. It should also be hard for competitors to replicate (Investopedia, 2010, p. 1). Alexander (2010) defines distinct competencies as capabilities or attributes that make your company clearly superior to your competitors in things that customers care about. Based on Alexander's distinction between core and distinct competencies, he argues that core competencies are good, but distinct competencies are better since, "The key to marketplace uniqueness is not core competencies but distinct competencies" (p. 1). Thus, DLAs must seek to develop, build and capitalize chiefly on distinct competencies to develop competitive advantage in the growing and mature distant learning market. DLAs must remember that not only absolute distance educational institutions are strong and active players in this market, but that there are also traditional colleges and universities with extremely strong distance learning arms supported by their years and even centuries of robust educational reputations.

Educational Value and Quality Perceptions in Distance Learning

Both value and quality can act as factors of core and distinct competencies depending on how effectively and efficiently their coordinating variables are managed in the distance learning setting (McFarlane, 2011). Value in education is defined from both economic and marketing standpoints and refers to the extent to which a good or service is perceived by its customers to meet their needs or wants, measured by customers' willingness to pay for it. Thus, value from this perspective depends more on customers' perceptions of the worth of the service than on its intrinsic value (BusinessDictionary.com, 2010, p. 1). Economically, value describes the worth of all the benefits and rights arising from ownership of and interaction with of a good or service. As such, there are two types of economic value: (i) the utility of a good or service, and (ii) the power of a good or service to command other goods, services, or money, in voluntary exchange (BusinessDictionary.com, 2010). Quality is either a subjective or objective measure of the value of goods or services. When it comes to education or distance learning, subjective quality is what we are concerned about. Subjectively, quality describes the attributes, characteristics, or properties of a thing or phenomenon that can be observed and interpreted, and may be approximated (quantified) but cannot be measured, such as beauty, feel, flavor, taste, etc (BusinessDictionary.com, 2010). Educational value and quality matters, especially in a society where increasing competition and decreasing available opportunities are forcing employers and other institutions to discriminate in the types of talents and degrees they select in terms of perceived value and quality when it comes to competencies of knowledge workers.

According to McFarlane (2008a), "the knowledge worker is a product of education, technological marvel, and modern development in organizational practices and theories" (p. 1). DLAs must bear this in mind as they lead the effort to develop and delivery value and quality in education using technology and current organizational strategies and policies. Johnson and Weinstein (2004) define value and quality in terms of the design and delivery of customer value, and in the case of distance learning, customers are students and employer organizations where students become hired or seek jobs with their distance learning skills, certifications, degrees, and education. Customer satisfaction variables are especially important in higher educational settings where distance learning is prevalent. This view is supported by Maguad (2007) and McFarlane (2008b) who argue that customer satisfaction is probably the most important element in managing quality in higher education. McFarlane (2008b) argues, "Students have and do foster great expectations of the institutions meeting their needs. These expectations expressed in the forms of needs, wants, desires, opinions, etc, translate into interpretation of what defines quality, value, effectiveness, and all the variables of customer satisfaction" (p. 1).

Perceived value and quality are determined and affected by individuals' experiences, levels of satisfaction, psychological and mental states, the totality of experience concerning a service or product, image, price and those same characteristics in substitutes or alternatives and customer value (Johnson & Weinstein, 2004; Zeithaml; 2000; Zeithaml, Parasuraman, & Berry, 1990; 1996; Parasuraman, Zeithaml, Berry, 1985; 1986). In addition to the foregone factors, efficacy perceptions affect the perceived value and quality in educational settings (McFarlane, 2010b; Tschannen-Moran & Gareis, 2004; Rowland, 2008) based on faculty self-efficacy and the impact on students' learning and achievement (Houchard, 2005). While both value and quality are relative terms, there are certain basic expectations concerning value and quality that programs and institutions must meet. This is especially the case in the higher education industry where accreditation has become a basic requirement for institutions offering distance learning opportunities. Accreditation is the fundamental criterion for asserting minimum value and quality through quality assurance integrity as decided by an external agency or commission. In today's education market accreditation is undertaken by mainly private agencies, especially in the United States where three major types of accreditation prevail in terms of geographic scope: regional, national, and international-global, with regional accreditation being the most desirable. Accreditation refers to "the recognition that an institution maintains standards requisite for its graduates to gain admission to other reputable institutions of higher learning or to achieve credentials for professional practice" (U.S. Department of Education, 2010, p. 1). DLAs should ensure that programs are adequately approved by State licensing agencies and accredited by appropriate bodies where required and necessary to legitimize and improve program structures, content and perceived value and quality.

Distance learning programs and institutions are accredited by a wide variety of agencies today as part of the quest to increase perceived value and quality. While the Distance Education and Training Council (DETC) is the most respected and well-known accrediting body when it comes to distance education exclusively, the six regional bodies recognized by the United States Department of Education, as well as other national private accrediting bodies are acceptable and sufficient to promote ideas of value and quality for their members. There are several national accrediting bodies besides the DETC, but the DETC is the most recognized non-regional accrediting body by the United States Department of Education. This gives it wide credence in distance education and learning programs even across the globe. Distance learning programs and institutions do not have to be accredited by DETC if they are already accredited by another national, or any of the six regional bodies or agencies; which are the most powerful accrediting agencies in the United States and across the globe. There are some specialized agencies with strong reputations for program value and quality as well, including the AACSB (Association to Advance Collegiate Schools of Business), IACBE (International Assembly for Collegiate Business Education), and Accreditation Council for Business Schools and Programs (ACBSP), among others (Cavico, Mujtaba, & McFarlane, 2010).

Since accreditation is fundamental, administrators of distance learning institutions and programs must strive to design, develop, implement, promote and foster value and quality in their teaching and learning, training and educational offerings. Curriculums should be built to capitalize on value and quality creation. There are several misconceptions, beliefs, and criticisms of distance learning institutions and programs that administrators must attempt to overcome as obstacles to recognition and progress through value and quality initiatives and strategies. Some of the misconceptions and criticisms regarding distance learning include: (i) beliefs and perceptions that distance schools and programs are less effective than traditional on-campus education; (ii) arguments that graduates of distance learning programs are less prepared, less intelligent, and less capable than students or graduates of on-campus programs; (iii) beliefs that most distance schools and programs are unaccredited diploma mills; (iv) beliefs and perceptions that distance learning degrees and programs are less challenging; (v) beliefs and criticisms that distance learning programs have inferior and less structure and contents compared to traditional, on-campus programs; and (vi) beliefs that quality is sacrificed in distance learning programs through focus and emphasis placed on speed and convenience, as well as decreased admissions criteria to some distance learning programs and schools. According to Gabriel (2010), the educational value of online courses has been debated for years, based on a large but uneven body of research, and the above beliefs and misconceptions are part of the problem when it comes to defining value and quality in distance learning. Given these challenges, DLAs and colleges and universities must become extremely concerned with the value and quality of education and services they offer to their students (Ham, 2003; McFarlane, 2008b).

The Solution: Effective Administrator Leadership

Researchers agree that there is a lack of effective leadership at all levels of organizations and society, and that effective leadership is central to organizational success (Zekeri, 2004; Brown & McLenighan, 2005; Davis, 2007; Covey, 1990). There is ever a great need for truly effective administrators in our education system. Educational institutions are hampered by ineffective leadership, and from K-12 to universities, in both public and private education systems, the lack of effective leadership has been regarded as one of the most fundamental problem of modern education (McFarlane, 2010b; Johnston, 2000). McFarlane (2010b) states that there is need for more effective leadership practices – exemplary leadership in educational settings, typical of the five leadership practices of modeling the way, challenging the process, enabling others to act, inspiring shared vision, and encouraging the heart (Kouzes & Posner, 2003). The success of any organization is an outcome of dynamic and effective leadership (Sharma & Dakhane, 1998) and distance learning organizations are characteristically, inherently dynamic because they must learn and adapt swiftly to the globally competitive environment where technology development and transformation affect their program structures and capabilities.

According to Williams (1998) effective leadership entails several assertions: accepting the responsibility and fact that leadership is not stress-free, creating a learning organization to avoid obsolescence, recognizing that there is no substitute for getting the job done, not becoming overcommitted, establishing very close relationships with followers and partners, being humble about one's competence and importance, learning how to apply and use power effectively without controlling followers, practicing open communication, being honest, learning and knowing about the influence of organizational politics, practicing unilateral integrity, being a team player, asking questions and being a good listener, making future strategic plans, and being optimistic about one's abilities to succeed when charting certain course. Effective DLAs are those who are very aware of these factors, especially within the structures of organizational relationships and systems that create and deliver learning modules to learners or students. In order to facilitate all these responsibilities and functions identified by Williams (1998), DLAs must be innovators, brokers, producers, directors, coordinators, monitors, facilitators, and mentors (Kayworth & Leidner, 2001).

Distance learning requires dedication on the part of administrators who must work with and cooperate with many individuals, especially their pool of staff and faculty to ensure that teaching and learning, and all student services are effectively and efficiently developed, planned, and delivered. As such, effective DLAs spend time honing the skills of collaboration, cooperation and relationship building, and strive to live beyond organizational norms and still manage to succeed (Martin, 2006). DLA leaders must understand the external environment and adapt rapidly to change and competition. There are two specific groups of individuals that DLAs must effectively lead and provide opportunities for to develop value and quality in programs. These are the faculty and the students, which are the vital links in the teaching-learning process.

Faculty Leadership Responsibilities

DLAs must lead faculty to achieve established program goals and objectives by providing access to training in the use of technology, development of pedagogy, increased interaction with students, coordination with faculty development staff and administrator, and continued education and training to sharpen skills in teaching. DLAs must provide faculty members with definitions concerning standards, value, and quality. Some practical methods that DLAs can use in developing faculty skills and effectiveness include:

a. assisting faculties in the use and application of technologies in the teaching process,
b. developing a faculty newsletter which provides tips and guidelines as well as up-to-date knowledge and information on distance learning,
c. creating a faculty research and writing department or center that oversees faculty publications in professional and peer-reviewed journals,
d. attendance and participation in conferences, and
e. developing high collaborative efforts between and among faculty, staff, and administrator to create common value and agreement.

DLAs must ensure that their staff and faculty are qualified both academically and professionally, and that these professionals are keen on delivering only quality instructions and high customer value.

Student Leadership Responsibilities

DLAs should focus their strategic planning efforts on outcomes. This means focusing on results for students. In doing so, they will naturally develop what McFarlane (2008b) calls a "customer-centric perspective" of the organization and the value and quality it must create and deliver to meet the needs of its customers and accomplish it mission and meet its vision. Realizing that universities and other institutions of higher education have to compete with each other to attract high quality students and academic staff at the international level, and that competition is no longer limited within national borders, as education and training have become a global business sector, education marketing is developing more standards akin to consumer goods marketing (Melewar and Akel, 2005). As a result, leaders in the field know that focusing on students is the key to success. This awareness on the part of DLAs must lead them to create student-friendly programs and environments; virtual and perceived customer service environments, where student satisfaction is a high priority as they concentrate on delivery of value and quality to students. DLAs can create and develop value and quality for students by:

a. having Student Appreciation Day,
b. offering scholarships for exceptional academic performance,
c. awarding and recognizing students for outstanding academic work
d. providing quality assignments,
e. developing students' newsletter and publishing students' success stories and testimonies in the newsletter, preferably electronic newsletter, and
f. providing opportunities for students to become members of honor societies and other professional and academic organizations.

DLAs must realize that distance learning programs do not limit student services offerings, and thus, can also arrange for internships and work opportunities for students.

Conclusion and Recommendations: Embracing Leadership Roles

DLAs must embrace their managerial-leadership roles that are informational, interpersonal, and decisional (Mintzberg, 1973). They manage people, systems, and processes and should take a true systems thinking approach in the distance learning. Mintzberg's model is further broken down into ten leadership responsibilities or functions with activities that DLAs can effectively apply to their duties and

responsibilities (*Table 2*). DLAs must deal effectively with information by being monitors, disseminators and spokespersons by effectively managing the flow and transfer of information to produce knowledge and ideas that effectively communicate rules, policies, and expectations. They must be able to motivate their staff and faculty members and lead organizational activities and programs as figureheads, leaders, and liaisons. Effective DLAs plan effectively in order to improve teaching and learning by preparing schedule, budget, setting priorities, and acquiring and distributing resources as needed by faculty and staff to respond to students' needs. They must also resolve any conflicts that arise between faculty and staff, as well as students or among educational and value-quality stakeholders. Effective DLAs are happy to represent their schools and programs at conferences, through media and community contact, and they identify new opportunities and projects for growth and success that will positively impact all members of the organization in their capacities as entrepreneurs, disturbance handlers, resource allocators, and negotiators.

Effective DLAs will understand and apply the guidelines of exemplary leadership as they seek to inspire a shared vision within the organization, unit or department. They must model the way by being examples of effective leaders and managers, and challenge others to think and work hard. They must enable others to act through empowerment and participatory leadership, and encourage faculty and staff to take a servant leadership approach to teaching and caring for students who are the ultimate customers and reason for being (Kouzes & Posner, 2003). Effective DLAs understand that the environment in which they lead is a rapidly changing one demanding continuous learning and adaptation. They see the need for managing and dealing with change, and through flexibility, share their leadership responsibilities and rewards.

Table 2: Distance Learning Administrators' Mintzbergian Roles

Leadership Roles	Managerial Responsibilities	Activities
Informational	*Monitor*	Seek and receive information, scan paper and reports, maintain interpersonal contacts with various businesses and partners
	Disseminator	
	Spokesperson	Forward information to others, send memos, make phone calls Represent the organization to outsiders in speeches and reports
Interpersonal	*Figurehead*	Perform ceremonial and symbolic duties, receive visitors such as accreditation agents
	Leader	Direct and motivate subordinates, train, advise and influence faculty and staff
	Liaison	Maintain information links in and beyond the organization
Decisional	*Entrepreneur*	Initiate new projects, spot opportunities, identify areas of business development
	Disturbance handler	Take corrective actions during crises, resolve conflicts among staff, adapt to external changes
	Resource allocator	Decide who get resources, schedule, budget, set priorities and acquire resources
	Negotiator	Represent department during negotiations with unions, suppliers, and generally defend interests.

Source: Adapted from London Management Centre (2010), *Mintzberg Ten Management Roles*.

DLAs should develop their leadership roles and strengthen influence to positively impact faculty and staff attitudes in accomplishing goals and objectives by understanding the obstacles they face and the environment in which they operate, and most of all, their customers or students. There are four important factors DLAs can integrate into their approach to effectively managing distance learning teams of faculty and staff: (i) promote a high levels of trust: as leaders DLAs must place trust in team members knowledge, and make commitment, motivation, and abilities an important part of their leadership strategy; (ii) foster an atmosphere with clear communication: as a leader, the distance learning administrator must foster clear communication since often distance can act as a communication barrier; (iii) exhibit strong leadership: the distance learning administrator as a leader must be very strong in directive and assistive behavioral qualities, and must have expert knowledge; and (d) must acquire and distribute to faculty and staff appropriate levels of technology. In order to become an effective leader of distance learning teams and programs, DLAs must become experts on technology, emerging trends in technology, technology usage, and must make technology an extension of leadership qualities (Bergiel, Bergiel, and Balsmeier, 2008).

Running an effective and successful distance learning program or institution requires having an established culture of value and quality; one which focuses on maximum input and maximum outcome for all individuals involved, especially those on the receiving ends; students and employees. Having good organizational culture with strong team citizenship behavior can bring a distance learning school or program a long way (Spector, 2010). Team citizenship behavior describes behaviors that exhibit good citizenship within team or among members working in a team and consists of the following behaviors among others: (a) altruism, (b) civic virtue, (c) conscientiousness, (d) courtesy, (e) teamwork, and (f) team mindedness (Pearce & Herbik, 2004). DLAs need to remember that they are not just managing technology and structures or systems, but are leading and managing people who have needs and wants, and that students nowadays require the highest levels of service because they always have many options in a global school economy where value and quality matter.

The informational, interpersonal, and decisional roles of DLAs place them in a position to affect quality and value at all levels of distance learning programs and institutions. By focusing on, and viewing their responsibilities as first and foremost, *quality and value leaders*, they are able to understand their roles as information providers, interpersonal managers, and decision makers. The information they receive, process, and disseminate; the types of organizational social relationships they foster and develop – *distance learning relationship management*; and the decisions they make, both tactical-operational and strategic, will affect quality perceptions and program as well as organizational goals.

DLAs in their roles contribute to quality and value by performing three major managerial roles (Mintzberg, 1973), and 12 important leadership functions identified by the author of this paper. These leadership functions are outlined in *Table 3* below. As the environment in which distance learning programs and schools operate changes, DLAs must become more responsive and responsible leaders who are able to apply innovative strategies and rapidly adapt and use information to capture new opportunities, deal with threats from competition, and improve performance. Effective distance learning leadership will become more critical to the success of schools and colleges as this teaching and learning modality continues to increase and meet the educational demands of millions in the 21st century.

Table 3: Three Managerial Roles and 12 Leadership Functions of Distance Learning Administrators (DLAs).

Informational Roles *Technology leader*: select and assisting in determining technology platforms, costs, application, and developing rules for effectively and ethically using technology. *Information organizer*: organize information in ways meaningful to the organization and information users. *Information disseminator*: distribute information to the correct personnel and departments where needed to perform tasks. *Information Processor*: process or utilize information as needed to understand issues and challenges and make the right decisions.
Interpersonal *Relationship manager*: manage the relationship among staff, faculty, and students *Team and Group leader*: lead staff and faculty – instructional and technology, to achieve program goals and deliver top quality student services, effective teaching, and *Partnership developer*: develop partnerships with businesses and agencies to positively affect marketability, quality, and services provision and expansion, as well as competitiveness. *Motivator*: provide motivation for staff, faculty, and students and lead in ways that encourage the distance learning team to strive for excellence.
Decisional *Innovator*: identify and develop new projects, programs, and methods for increasing program and service quality for instructors and students. *Change leader and manager*: initiate, indentify, respond to and lead change in the distance learning and online environment by keeping abreast of emerging technology, policies, and demands. *Regulator*: regulate policies and determine protocols for meeting existing program and institutional goals *Decider*: make all relevant decisions by using correct information and soliciting participation from employees when relevant.

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Assuring Quality in Large-Scale Online Course Development

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Abstract

Student demand for online education requires colleges and universities to rapidly expand the number of courses and programs offered online while maintaining high quality. This paper outlines two universities respective processes to assure quality in large-scale online programs that integrate instructional design, eBook custom publishing, Quality Matters™ standards, faculty development, and internal quality assurance reviews and external peer-reviews.

Introduction

In the fall term of 2008, over 4.6 million students took at least one online course (Allen Seaman, 2010). The growing need for online education is coupled with the demand for accountability and transparency in higher education. In the era of such programs as *No Child Left Behind*, institutions are asked to publicly and systemically assess student learning and measure the effectiveness and quality of their educational offerings. Colleges and universities, particularly those that are experiencing marked increases in student enrollment and expansion of degree programs, are instituting policies and processes to assure academic quality, fidelity, and rigor in their online and campus-based programs.

Founded in 1918, Ashford University offers graduate and undergraduate degree programs online and at its Clinton, Iowa campus.University of the Rockies is a graduate school specializing in master's and doctorate degree programs in psychology. Classes are offered online and at the University's Colorado Springs, Colorado campus.Both institutions are accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools and are part of Bridgepoint Education.

Quality Matters™

Both Ashford University (Ashford) and the University of the Rockies (Rockies) subscribe to Quality Matters™. The Quality Matters™ (QM) program is a faculty-centered peer course review quality assurance process for online courses. The goals of the program are to increase student retention, learning and satisfaction in online courses by implementing better course design. QM has been adopted by hundreds of higher education institutions across 35 states and Canada.The QM Rubric is based in national standards of best practice, the research literature, and sound instructional design principles.The QM standards involve the evaluation of course overview and introductions, learning outcomes, assessment and measurement, resources and materials, student interaction, course technology, learner support, accessibility, as well as the alignment among these elements within the course. These standards and best practices can be leveraged for an institutional approach to quality assurance through faculty development and support; instructional design and course development; quality assurance; and assessment.

Faculty Development

Skilled faculty members and robust faculty development programs are key components of quality online learning (Rockwell, Schauer, Fritz, Marx, 2000; US Department of Education, 2006; North Central Association of Colleges and Schools, Higher Learning Commission, 2007). Faculty development for online educators must provide both training as well as continuous support (Willis, 1994). The focus on the quality of faculty members begins with screening and selection of faculty. At both Ashford and University of the Rockies, potential faculty are screened, interviewed, and vetted for both academic and professional qualifications. All potential online faculty participate in a three-week online interview and training course that assesses their skills in computer-mediated communication, adult learning and pedagogy, discussion facilitation, and providing formative and summative feedback to students. Additionally, seasoned faculty members mentor University of Rockies faculty candidates through their first course. All online faculty trainers at Ashford and University of Rockies are certified reviewers by Quality Matters™ and efforts are underway to train and certify many online faculty. On-going faculty development opportunities are provided by a partnership of academic affairs and learning and development departments.

Continuous support is another essential element of quality assurance for online learning. Both institutions utilize specially trained Instructional Specialists to provide instructional support to faculty members teaching online. Online Faculty Mentors and Lead Faculty also provide content area and pedagogical support to online faculty. Zygouris-Coe et al (2009) found that a well-structured quality-assurance strategy for monitoring online faculty was reported to be worthwhile and had a positive impact on the instructors performance in the online classroom.

Instructional Design and Course Development

High quality online courses are intentionally designed by skilled professionals and guided by best practices and current research in teaching and learning. In large scale course development projects, Course Developers are faculty and/or subject matter experts who bring their content knowledge and teaching experience to the development project. By pairing faculty members with instructional design and curriculum specialists in an environment that provides project management, process infrastructure, and tools and support systems, online courses can be developed on a large-scale while maintaining high quality. University of the Rockies and Ashford University have each developed a course development process that balances the need for rapid course development while maintaining the benchmarks for high quality. Since Ashford University and University of the Rockies have different missions, values, and administrative and governance structures, as well as serve different student populations, their respective course development processes and procedures reflect their unique mission and identities.

However, both institutions use course development templates that support course development teams and provide guidance regarding course quality standards and pedagogical philosophies. Course design templates are effective tools to establish and support the course design standards, style guidelines, and instructional expectations of the institution (Henry et al, 2008).

Ashford University has separate, but overlapping, processes for the development of new courses and the revisions of existing ones. New course development is preceded by meticulous research and a resulting program proposal prepared by the Program Director which is submitted through an approval process governed by the faculty of the university. Once approval has been granted, the course development process begins.

For both new courses and existing courses scoped for revision, the Program Director screens and selects a subject matter expert or a team of experts to develop (or revise) the course (or program). In the case of a teaming (sometimes this is preferred for new programs), the course development team convenes to brainstorm, collaborate, strategize, and to set the direction for course development. The course development team consists of some or all of the following: Course Developer (subject matter expert), Instructional Designer, Curriculum Coordinator, Technology Specialist, and Assessment Specialist. For both course development scenarios (new and existing) the Course Developers are sent a Course Developer

Kit. The kit contains the course developers template, course specific information (such as program and course outcomes, course description, and other relevant items) including guidelines prepared by the Instructional Designer or the Program Director, a link to the course developers blog, and the text (if already chosen).

The Course Developer submits course content to the Instructional Designer for review and formative feedback. This is an iterative process with the Instructional Designer and Course Developer working collaboratively with the templates and learning resources. Together they select the appropriate instructional strategy, ensure proper sequencing, and integrate instructional media solutions per established guidelines.The Instructional Designer works closely with the Instructional Technology Specialists to develop the multimedia solutions.

For courses identified for custom publishing, textbooks are specially written and tailored to align with and support course learning outcomes, Ashford's course delivery model, and most importantly, the Ashford University learner. Program Directors work directly with Bridgepoint Educations publishing group to develop the texts. They are offered to students and faculty as eBooks or hard copies. Additionally, Ashford is working with the major publishers to offer students the eBooks alternative for all texts.

The final draft of the course content is then reviewed by the Program Director and, once approved, submitted to the Dean for approval. Concurrently, a Curriculum Coordinator creates or updates a master course in the learning management system and creates or updates the Waypoint Outcomes™ rubric. Waypoint Outcomes™ is an assessment software tool that collects assessment data and provides formative and summative feedback to students related to the assessment. Further, for revised courses, the Curriculum Coordinator initiates communications with teaching faculty and academic advising regardin

Once courses have been completed, the academic quality administrator, who is also the co-QM Institution Representative, performs an informal internal QM review and works with the Instructional Designer to make changes to the courses is necessary.

The University of the Rockies uses a similar workflow for course development. New courses and programs ideas are researched for feasibility, fit with the mission and identity of the University and potential student needs. A curriculum and assessment plan is developed and the program or course is submitted through the faculty governance structure for approval. Courses are generally scheduled for revision by a Faculty Content Area Coordinator (a lead faculty for that specific content area) or Program Director. The course is then assigned to a Curriculum Coordinator who selects and contracts a Course Developer who has been approved by the Dean. The Curriculum Coordinator provides the Course Developer with the Course Development Guide, Course Development Guide Template, and project schedule.

The Course Development Guide provides Course Developers with information about the Universitys values, mission, and instructional philosophy; the institutional and programmatic learning outcomes, current research and best practices for such tasks as selecting learning resources; writing strong learning outcomes, discussion questions that foster retention and student engagement; aligning assessment with outcomes, and employing active learning strategies in asynchronous learning environments.

The Course Development Template is a document template that Course Developers complete for each essential element of the online course (e.g. instructional strategies, sequencing of content, weekly learning outcome, learning resources, discussion questions, and assessments). Like Ashford University, the University of Rockies template was designed to support Quality Matters™ standards and provides the Course Developer with suggestions, checklists, and issues to consider to aid in the development of the online course content.

With the support of the Curriculum Coordinator, the Course Developer writes the first draft of the course including the high level course outline and learning outcome and topic map, the summative (final) assessment, and Week 1 of the content. This draft and course outline is reviewed and approved by the Instructional Designer and Lead Developer. The Lead Developer is a faculty member who provides curriculum oversight to a degree program or specialization area and serves as the lead subject matter expert. Concurrently, the Curriculum Coordinator and Course Developer review and select books, learning resources, and media enhancements which are approved by the Dean.

Once the first deliverable is approved by the Curriculum Coordinator and Lead Developer (if applicable), the Course Developer develops the rest of the course content, which is iteratively reviewed and approved by the Curriculum Coordinator and Lead Developer or Program Director. Once the Course Template is complete and approved, the course is then reviewed by the Instructional Designer.

Once the course has been approved by the Curriculum Coordinator, Lead Developer, and Instructional Designer, it is submitted to the Director of Academic Quality to be reviewed by Quality Assurance Reviewers. The QA Reviewers are Quality Matters™ certified reviewers who hold at least a masters degree (most hold terminal degrees) in instructional design. The QA Reviewers use the Quality Matters Rubric to review each course. Once the course is approved by the QA Reviewer, the Curriculum Coordinator creates the course master into the learning management system.

Quality Assurance

Within the Quality Matters™ program, courses are reviewed by a team of three peer reviewers using the QM Rubric. Ashford University and University of the Rockies both perform informal internal and formal external reviews of all online courses. The formal external review is performed through Quality Matters™ and utilizes at least one external reviewer, one master reviewer, and one faculty or course developer who are familiar with the course. Both institutions are formally submitting all courses through a formal QM review.

Measuring Effectiveness

Student end-of-course surveys. Student feedback in the form of end of course surveys provide institutions with information students educational experiences. Both Ashford University and University of the Rockies survey all students at the end of the each online course. Five of the student end-of-course surveys (SEOSC)questions directly address academic quality:

- The quality of my educational experience has met my expectations.
- How would you rate the quality of your instructor?
- How would you rate the quality of this course?
- How would you rate the quality of the course material?

The data from these surveys are used to gauge the quality of the holistic student experience, instructor, course, and course materials. Further, there is a feedback mechanism for online faculty to provide feedback about course design or issues with courses (e.g. dead links) to the curriculum team. Instructional specialists and other members of academic affairs work with faculty members who may need assistance or guidance based on the SEOSC data.

Course developers experience. University of the Rockies surveyed the course developers who participated in a large-scale course development project using the Quality Matters™ tools and templates. The unpublished results were presented at a conference in 2009 (Kirkpatrick, Parscal, Steed, 2009).

Of the 33 course developers who responded to the survey, 73% reported being experienced with online course development, but only 21% reported that their prior experience with online course development was with University of the Rockies. When asked to rate their level of experience with online course development after the course development project, the majority of developers reported that they were experienced or highly experienced.

Table 1. Experience of course developers

Level	Number	Percentage
Highly experienced	5	15.2%
Experienced	15	45.5
Developing	9	27.3
Beginning	9	27.3
Inexperienced	0	0

The majority of developers found the Course Developers Guide provided useful information about the Universitys standards for online courses.

Table 2. Question: The Course Developer's Guide provided me with useful information about the University of the Rockies standards.

Response	Number	Percentage
Strongly agree	11	33.0%
Agree	20	60.6%
Neutral	1	3.0%
Disagree	1	3.0%
Strongly disagree	0	0

Table 3. Question: The Course Developer's Guide provided me with useful information about designing a high quality online course.

Response	Number	Percentage
Strongly agree	11	33.0%
Agree	20	60.6%
Neutral	2	6.0%
Disagree	0	0
Strongly disagree	0	0

Most course developers reported that the template helped the developer be more effective (Table 4) and produce a high quality course (Table 5).

Table 4: Question: The Course Developer's Template helped me to be more effective as a Course Developer.

Response	Number	Percentage
Strongly agree	8	24.2%
Agree	19	57.6%
Neutral	4	12.1%
Disagree	1	3.0%
Strongly disagree	1	3.0%

Table 5. Question: The Course Developer's Template helped me to develop what I consider to be a high quality course.

Response	Number	Percentage
Strongly agree	11	33%
Agree	18	54.5%
Neutral	3	9.1%
Disagree	1	3.0%
Strongly disagree	0	0

Future Studies

Research is underway that surveys both Ashford University and University of the Rockies course developers about their experience developing courses using the processes and tools. Further, research is occurring that examines the quality of course design from the student perspective.

Conclusion

Institutions that offer online education can leverage the use of tools such as templates and quality assurance rubrics such as Quality Matters ™ to set expectations and internal standards for academic quality and rigor. The use of templates enable Course Developers to focus on the course content and pedagogy by scaffolding the alignment, navigation, and formatting. By having an Instructional Designer review the Course Developer&s first submission which is essentially a proof-of-concept and high level design document, provides the Course Developer and Lead Faculty with formative feedback to inform the revision of the first deliverable and the creation of the remaining content for the course. Further, two levels of quality assurance reviews using a valid and reliable rubric, provides the institution with confidence that the courses are of high quality.

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Full length Research Paper

Designing quality e-learning environments for higher education

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With the ever-increasing integration of online learning (or e-learning) into university courses, there is strong need for practical guidelines and recommendations to facilitate the development and delivery of pedagogically effective e-learning environments. An investigation by Siragusa (2005) examined factors which make for effective instructional design principles and learning strategies for higher education students studying within these learning environments. Surveys were administered to students and lecturers in Western Australian universities which revealed numerous areas of students' e-learning experiences which they had perceived as being successful and those needing improvements. This paper presents a model containing 24 sets of recommendations that were developed from the study's survey findings. The 24 recommendations accommodate the varying pedagogical needs of learners as well as modes of course delivery. For each recommendation, a pedagogical dimension is presented to illustrate the pedagogical needs and instructional requirements. These 24 dimensions, which are grouped within nine main sections, highlight the decisions which need to be made during the instructional analysis, design, delivery and evaluation phases of e-learning environments in higher education in order to optimise their pedagogical quality.

Keywords: Quality e-learning environments, higher education, pedagogical quality optimisation

INTRODUCTION

Higher educational institutions are increasingly moving toward the use of the Internet for delivery of their courses, both on campus and at a distance (Ally, 2004; Kim and Bonk, 2006). The Internet provides significantly different and interesting possibilities for computer-meditated communication and learning from other forms of educational technologies (Weller, 2002). In some cases, courses are delivered exclusively online to students in remote locations and supplementary materials may also be mailed out. The entire class website can be duplicated onto a CD-ROM for the students with slow and unreliable Internet access. In other cases, the lecturer may use a class website as a supplement to their face-to-face delivered classes. Some lecturers utilise the class website for the teaching of specific skills and knowledge through automated pre-programmed online activities that can provide specific feedback to students' answers (Scott and Judd, 2002). There are, therefore, ways in which e-learning may be utilised based upon pedagogical needs.

The development of instructionally effective online learning environments that meet these pedagogical needs require the application of appropriate instructional design principles. The literature suggests that there are gaps between the bodies of knowledge relating to learning theories, instructional design principles and student learning in higher education, (Siragusa and Dixon, 2005a). A recent PhD study (Siragusa, 2005) developed a theoretical framework and research methodology (Siragusa and Dixon, 2005b) which made links between these bodies of knowledge together with this study's research findings in order to put forward instructional design principles that effectively promote the use of online learning to meet the varying pedagogical needs in higher education. These instructional design principles are presented within a model, which is based upon Reeves and Reeves' (1997) model for creating pedagogically effective online learning environments. Reeves and Reeves put forward 10 pedagogical dimensions of interactive learning on the World Wide Web. The new model developed from the PhD study expands upon Reeves and Reeves' (1997) model and presents 24 pedagogical dimensions. These 24 pedagogical dimensions are described within the following nine main sections. They are then presented within a model, followed by an example of their application.

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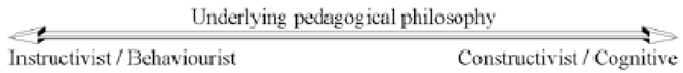

Figure 1. Dimension for underlying pedagogical philosophy

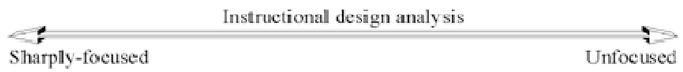

Figure 2. Dimension for instructional design analysis

Pedagogical philosophy and instructional strategy for e-learning

Ally (2004) argued that in order to promote higher-order thinking through technology-based learning environments, instructional strategies which promote learners to make connections with new information to old, acquire meaningful knowledge, and employ metacognitive thinking skills are required within the e-learning environment. This requires an analysis of the learner, the learning context and the learners' specific learning needs. Students may be required to learn a set of principles within a discipline area and integrate previously learned knowledge with new knowledge by employing techniques such as advanced organisers, worked-out examples, and elaborative questions. A lecturer with postgraduate students completing a Masters degree may prefer to adopt a constructivist approach to teaching, where students are encouraged to construct their own meaning of the content through their prior experiences. The varying underlying pedagogical approach is represented along a dimension as illustrated in Figure 1.

Instructional design processes for e-learning

Caplan (2004) and Davis (2004) described how, in an ideal world, educators, instructional designers, e-learning media developers and graphic designers all work together to create pedagogically effective learning environments that are grounded in sound learning theories. In many cases, however, the lecturer is often left without this team support and resources. There are, however, aspects of the instructional design process that the lecturer needs to consider when creating pedagogically effective e-learning environments regardless of the available resources.

Instructional design analysis

The development of online learning environments needs to draw upon the vast body of knowledge relating to instructional design models (Dick et al., 2005; Gagné et al.,1992) for the analysis of instruction, the learners (background, prior knowledge, motivation, etc.), the learning context, development of an instructional strategy, and evaluation. A lecturer requiring students to learn a particular concepts will take into account the learning environment in which this understanding will be demonstrated, the students' characteristics (e.g., their prior knowledge and motivation to learn). The lecturer will then develop an instructional strategy which will employ online learning technologies to assist with achieving this instructional goal, or he/she may adopt a constructivist learning environment where students combine new learning with existing knowledge and the learning experiences are authentic depictions of existing practices. The lecturer may develop formative and/or summative evaluations to identify how to improve the instruction and to determine the overall effectiveness of the instruction. The level for which instruction incorporates an instructional design process of analysis, strategy development and evaluation may be represented along a dimension as illustrated in Figure 2.

Content

The detail and extent of the content provided to students may vary depending upon the students' pedagogical needs. Students studying entirely online must have access to all of the unit content including the learning outcomes, assignment requirements and relevant resources. Students attending face-to-face classes may receive the content in class and additional content on the supplemental class website. Students studying a first year undergraduate unit in mechanical engineering need to have an understanding of the underlying principles and, therefore, the content needs to be complete,

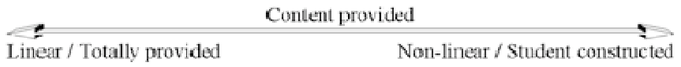

Figure 3. Pedagogical dimension for content provided

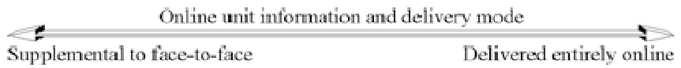

Figure 4. Dimension for online unit information and delivery mode

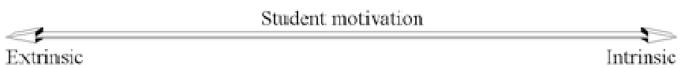

Figure 5. Pedagogical dimension for student motivation

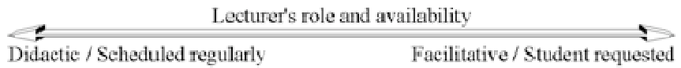

Figure 6. Dimension for lecturer's role and availability

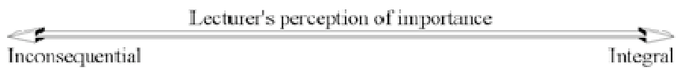

Figure 7. Dimension for perceived importance towards online learning

Figure 8. Dimension for lecturer's online learning abilities

relevant and accurate, (Glaser, 1987). The purpose of the class website should be made clear and unambiguous instructions for access, navigation to relevant information, and use of communication tools and other features of the website. Students studying at postgraduate level may need to construct their own knowledge based upon their literature review and research and, therefore, less content is provided. Figure 3 illustrates two contrasting pedagogical approaches relating to content on a pedagogical dimension.

Online information and delivery mode

The amount of information to provide on a class website may be determined by the delivery mode. If a unit is to be delivered entirely online, then the website must include all the information needed for students' successful completion of the unit including appropriately detailed content, learning activities, assignment requirements, and supporting materials. Students in remote locations with unreliable Internet access may need to receive a copy of the entire unit's information in paper-based and possibly CD-ROM format as a backup. If the class website is to be supplemental to face-to-face classes, then the lecturer will need to determine which information will be provided on the website and which information shall be distributed during classes. The unit information to be provided on the class website, depending upon whether the unit is delivered entirely online or if online learning is supplemental to face-to-face classes, may be represented along a dimension as illustrated in Figure 4.

Student motivation in e-learning

Students enrolled in higher education courses come from a variety of backgrounds and have different reasons for studying. While it is generally accepted that online learning designers should use intrinsic motivation strategies, extrinsic motivation may also be used. A university student may be extrinsically motivated in only doing what is required in order to pass units without a significantly deep interest for the subject. Students studying in distance mode need to feel that they are part of a group of learners and are able to obtain assistance with the unit's requirements and technical difficulties. For students who are intrinsically motivated to study due to a desire to develop a deeper understanding of the subject matter content which fosters deeper understanding of the subject and relates to real-life and employment situations should also be included. Figure 5 illustrates the varying pedagogical approaches towards motivation.

Lecturer's role in e-learning

The lecturer's role is an important factor in the design of technology-based environments in that various roles can be supported. While there is much written about how e-learning technologies can facilitate greater interaction and collaboration for students and their lecturer in the teaching and learning process (Maor, 2003), there are several facets of the role of the lecturer that can impact upon how e-learning environments are developed and delivered. The following discusses the considerations that developers and lecturers need to take into account for each of these facets when designing e-learning environments.

Lecturer's role and availability

The lecturer's role is an important factor in the design of online learning environments in that various roles can be supported (Reeves and Reeves, 1997). A lecturer with a unit of first year undergraduate students may need to assume a didactic role in order to guide students' learning. This lecturer needs to be available at regularly scheduled times to assist students with the learning activities and for clarifying concepts. For students not required to attend face-to-face delivered classes, lecturers may consider scheduling face-to-face sessions depending upon the students' needs to discuss the content and assignment requirements. A lecturer with postgraduate students studying entirely online may assume a facilitative role and be available to assist students as required either through online communication facilities or via telephone. Lecturers should routinely check the online communication facilities for new postings and provide prompt and adequate replies to student questions. The varying lecturer's role and expected availability may be represented along a dimension as illustrated in Figure 6.

Lecturer's perception of importance

How lecturers perceive the importance of online learning will influence how online learning is utilised and integrated into their teaching practices. Lecturers with a low perception of the importance of online learning may not fully consider how to apply online strategies to enhance their students' learning. Lecturers with high perceptions of the importance of online learning may explore integrating learning strategies utilising online technologies such as automated interactive activities. Educators also need to consider how students studying online may perceive themselves as being disadvantaged compared to other students completing the same unit with face-to-face classes. Therefore, students studying entirely online need to receive the same detailed information, including the lecturer's verbal elaborations during lectures as received by students attending face-to-face delivered classes. Learning strategies may be developed for encouraging students to utilise online communication facilities such as conducting discussions about specific topics and discussion based on issues relating to their assignments. Lecturers may also encourage students to maintain a reflective journal to record what they have learned through collaborative learning. Figure 7 illustrates levels of significance of the lecturers' perceptions of the importance of online learning represented along a dimension.

Lecturer's online abilities

Lecturers' knowledge and abilities of online learning technologies may influence how they utilise the class website to enhance their students' learning. A lecturer with a low understanding of online learning technologies may simply use the website as a repository of content for students to access, print out and read elsewhere without active online engagement with the learning materials. However, a lecturer with sound knowledge of online learning technologies, may use these technologies for creating effective learning strategies such as interactive online learning activities including online quizzes and encouraging students to present their assignments on the online LMS. Lecturers' varying abilities to use the Internet to enhance their teaching may be represented along a dimension as illustrated in Figure 8.

Lecturer's online support and training

Lecturers involved in developing further knowledge of online learning through professional development may integrate what they learn into their own online learning environments. Lecturers not interested in further developing their knowledge of online learning may only be interested in getting the learning materials onto their class website in the quickest way possible without knowledge of whether there are better ways of presenting these materials. Lecturers with advanced knowledge of

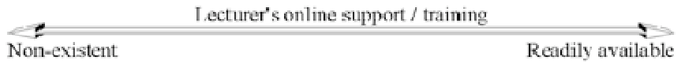

Figure 9. Dimension for lecturers' online support and training

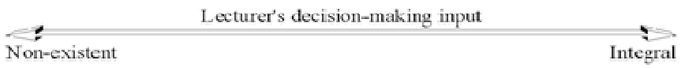

Figure 10. Dimension for lecturer's decision making input

Figure 11. Dimension for development activities for online learning

online learning development practices may apply more efficient ways of presenting the same learning materials. Educators need to be aware of the labour intensive nature of online learning and the resources available to assist with the development of effective online instruction. The university's reward and promotional system should acknowledge lecturers' activities with developing successful online learning and mentoring other staff members in their online delivery of units. Figure 9 illustrates the dimension, lecturers' availability of support and training.

Lecturer's decision making input

Lecturers showing interest in the development and decision making aspects of online learning are often involved in innovative solutions for online learning within their teaching area (McMurray and Dunlop, 1999). A lecturer with a specific need for online learning to assist with the teaching of specific concepts may explore the use of automated interactive activities. Therefore, lecturers need to be aware of their university's policies and decision making process and be encouraged to put forward their input regarding the direction of online learning development. A collegial atmosphere of sharing, innovative ideas, exemplary examples and experiences relating to online learning within the university should be encouraged. Varying involvements with the decision making process regarding online learning may be represented along a dimension as illustrated in Figure 10.

Lecturer's development activities

The existing body of knowledge relating to instructional design should be made aware to all lecturers involved in the development of online learning (Siragusa & Dixon, 2005a). Lecturers involved in online learning design are more likely to employ some form of instructional design process in order to analyse and accommodate the specific learning needs of their students. The class website may be utilised to assist with students' learning through carefully planned activities. For example, a lecturer may require a group of students to understand a particular concept through exploration of specific information on the Internet, completing online collaborative activities, sharing ideas, and using the class website for presenting their collated information and completed assignment for other students to review. Lecturers may consider undertaking professional development in order to further develop effective teaching and learning strategies for enhancing student online learning. Figure 11 illustrates the level of online learning development activity along a dimension.

Infrastructure for e-learning

Davis (2004) described the infrastructure for online learning including student support. Parker (2004) described 24 benchmarks for quality Internet-based distance education including institutional support, student support and course structure. The following discusses how student support may be provided within the structure of e-learning.

Structure and organisation

The structure of the class website, including navigation, information provided, and use of the online LMS features may vary depending on the targeted students and pedagogical need for online learning. The website's structure may be rigid so that students can only follow a linear learning path, such as a first year undergraduate unit where specific knowledge needs to be taught. Suitable learning materials represented in appropriate learning steps when it is most needed with additional

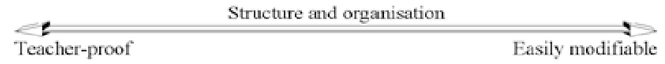

Figure 12. Pedagogical dimension for structure and organization

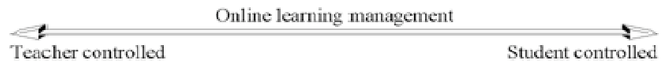

Figure 13. Dimension for online learning management

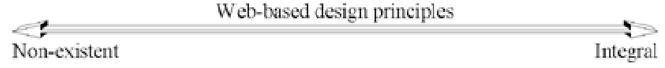

Figure 14. Dimension for web-based design principles

materials to develop deeper understanding of the content needs to be provided. The structure, including navigation, must be self-intuitive. Flexibility may be provided to develop the structure as needed, such as a postgraduate student developing a thesis. These contrasting pedagogical approaches relating to structure can be illustrated on a pedagogical dimension as shown in Figure 12.

Online learning management

The features contained within proprietary online LMS applications may be utilised by students in various ways for enhancing their online learning experience (Ryan et al., 2000). A lecturer with first year undergraduate students may wish to utilise the student progress tracking feature allowing students to have access to their progressive assignment and test scores throughout the duration of the unit. This lecturer may also encourage students to post bulletin board messages to particular discussion topics and to follow particular discussion threads. Students may be encouraged to present their assignments on the class website for other students to review. Students may also be required to complete automated quizzes within the LMS.

The lecturer may also post significant dates, such as assignment due dates, on the online class calendar. A lecturer with postgraduate students may simply provide some of the features on the online LMS for students to utilise as they choose without incorporating specific teacher controlled learning strategies. The level of teacher control over how students use the online LMS application's features may be represented along a dimension as illustrated in Figure 13.

Web-based design principles

While developing an online learning environment, sound web design principles (Lynch and Horton, 2002) suited to the targeted audience need to be employed including self-intuitive navigation, page layouts, text usage, background colours and textures, compatibility with various computer configurations, and allowances for human disabilities. A lecturer may require students to read particular passages of text from web pages before completing an online interactive activity. The design characteristics of web pages need to conform to appropriate design guidelines for suitable viewing on the web. The employment of graphics, animations and Flash-programmed activities need to be considered in order to reduce the amount of unnecessary text needed to describe a particular concept, while accommodating varying conditions including slow connection speeds. Figure 14 illustrates the varying employment of web design principles and web-based technologies along a dimension.

Subject content and instructional strategies for e-learning

Ally, (2004) argued that e-learning designers should select learning strategies that motivate learners, facilitate deep processing, build the whole person, cater for individual differences, promote meaningful learning, encourage interaction, provide feedback, facilitate contextual learning, and provide support during the learning process. Pedagogical issues relating to content and learning strategies to be considered during the design of e-learning are discussed in the following.

Development of learning strategies

Instructional design decisions can influence and encourage different learning strategies that can be used by students (Bull et al., 1998; Smith and Ragan, 2005). The development of content for online

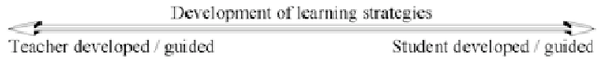

Figure 15. Dimension for the development of learning strategies

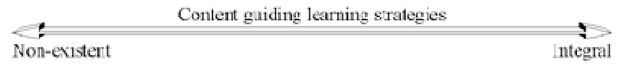

Figure 16. Dimension for the content guiding learning strategies

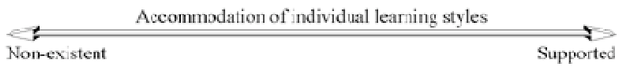

Figure 17. Dimension for accommodation of individual learning styles

learning may include specific learning strategies for building new knowledge upon previously learned knowledge. A lecturer with a first year undergraduate group of students may encourage students to work collaboratively in finding specific information on the Internet and report their findings to the rest of the class via the bulletin board. Students may also be encouraged to share their thoughts regarding the content and assignments via communication facilities. If students are working in an on-campus computer laboratory, they may be encouraged to interact with each other through online chat while solving particular problems. A lecturer with postgraduate students may encourage them to develop their own learning strategies for a particular problem, and to encourage them to maintain a reflective journal to record their successes and barriers to their learning. The lecturer may develop discrete strategies for observing successful online learning strategies developed by students. Observational strategies may include observing students as they study in the on-campus computing laboratories and monitoring the bulletin board messages. The lecturer should consider how future classes utilising a class website may adopt similar successful learning strategies. Figure 15 illustrates the variation between teacher developed and student developed learning strategies represented along a dimension.

Content guiding learning strategies

The content placed on the class website may assist with guiding particular learning strategies to foster deep understanding of the subject matter (Miller and Miller, 2000). A lecturer may provide discussions regarding a particular concept within the content. To reinforce those concepts, students may be required to contact associated industries or associations to either observe a particular situation or to assist with solving a particular problem through applying the concepts learned. After the students have completed the task, they may share their experiences through online facilities such as the bulletin board or the student presentation area of their online LMS. To facilitate these strategies, the content may include up-to-date real-life examples (e.g., employment situations that students may encounter), enrichment materials and links to relevant websites. The level which the unit is suitable for supporting such learning strategies may be represented along a dimension as illustrated in Figure 16.

Learning styles and study flexibility for e-learning

Ally (2004) argued that learning strategies within e-learning environments should accommodate various learning styles and allow learners to select appropriate activities suited to their own learning style. Ally (2004) also argued that, while online learning allows for flexibility of access from anywhere and anytime, the learning materials must be designed properly to engage the learner and promote learning. The following discusses how adequate support can be provided to learners to accommodate flexibility and individual learning styles.

Accommodation of individual learning styles

Lecturers involved in the development of online learning needs to consider how the design of online materials may accommodate students' learning styles and facilitate deep approaches to learning through active engagement with the online materials (Weigel, 2002). Students may be required to think about the learning tasks rather than just learning enough facts to pass an examination. The lecturer may wish to develop learning-focused activities for facilitating deep approaches to learning and accommodating individual learning styles. The lecturer may draw upon existing instructional design models for computer-based instruction for the development of learning-focused activities (Hsu et al., 2000; Soulier, 1988). Figure 17 illustrates varying support for individual learning styles along a dimension.

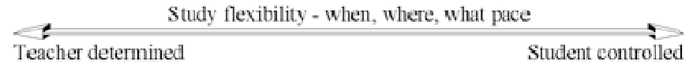

Figure 18. Dimension for online study flexibility

Figure 19. Pedagogical dimension for interaction

Study flexibility – when, where, at what pace

Students in higher education are demanding greater flexibility in the delivery of their courses (Ryan et al., 2000, p.12). The design of an online learning environment may facilitate whether students are able to study when, where, in what sequence and at what pace they choose. A lecturer with face-to-face delivered classes may not require students to attend every scheduled class and may provide self-directed learning materials on the class website during the weeks attendance is not required. A lecturer may require students to attend every scheduled class and the website is provided only as a supplement to face-to-face classes. The amount of flexibility allowed for student to study when, where and at what pace required may be represented along a dimension as illustrated in Figure 18.

Student learning strategies

When designing online instructional materials, consideration towards the different approaches to learning based upon contemporary learning theories is needed in order to select the most appropriate instructional strategies (Ally, 2004). As discussed earlier, the adopted online learning strategies should motivate student learning and facilitate deep approaches to learning. Ally (2004) suggested that learning strategies should promote meaningful learning, encourage interaction, provide feedback, facilitate contextual learning, and provide support during the learning process. The following describes instructional strategies which can be utilised for technology-based environments to promote effective student learning.

Interaction

Social constructivism suggests that learning is derived through a collaborative negotiation of meaning through multiple perspectives. A student interacting with other students and their lecturer, in conjunction with engagement with the content, will build his or her understanding of the unit's principles (Miller and Miller, 2000; Savin-Baden, 2000, p.34). Undergraduate students may build an understanding of the principles through structured online collaborative activities with class peers. Postgraduate students may initiate communicate with their peers as needed to discuss particular concepts or issues. Therefore, asynchronous communication facilities including a bulletin board and email need to be provided. Students and lecturers need to be familiar with the features associated with these facilities such as creating "threaded discussions." Lecturers should post an introductory message on the bulletin board at the commencement of the unit and then encourage students to post a short message introducing themselves to the group. Students may also be encouraged to post their thoughts regarding the content and assignment requirements on the bulletin board. Lecturers may encourage students to make regular postings to the bulletin board and the lecturer may post additional materials to assist with assignments. Discourteous and irrelevant comments should be discouraged. Synchronous online communication facilities such as online chat and online whiteboard may also be utilised. Online chat sessions may be schedule for the sharing of ideas and addressing concerns. Lecturers should prepare discussion topics prior to the scheduled chat sessions. Contrasting pedagogical needs for interaction is illustrated in Figure 19.

Collaborative learning

Ralph (1998) argued that student-centred learning should be encouraged through strategies such as cooperative learning. Student collaboration activities may be designed with varying levels of predefined structure. A lecturer with a first year undergraduate class may structure collaborative activities by defining the tasks for each group of students, defining tasks for individuals within the groups, devising procedures for reporting their progress and prescribing methods of presenting the completed assignments to the whole class. This lecturer may encourage students to utilise the bulletin board and email at various stages of the collaborative effort as well as

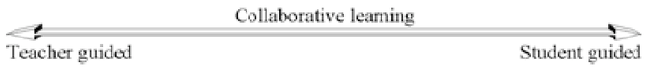

Figure 20. Dimension for collaborative learning

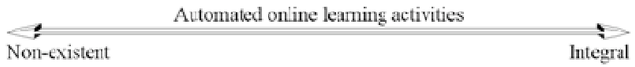

Figure 21. Dimension for automated online learning activities

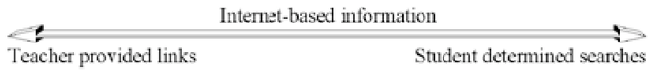

Figure 22. Dimension for Internet-based information

maintaining a reflective journal to record their contributions. Postgraduate students studying in remote locations may be encouraged to communicate with each other via the bulletin board and email as needed to assist each other with the assignments. They may share ideas about the assignment tasks and to post draft versions to each other for checking. Figure 20 illustrates the varying use of collaborative learning activities represented along a dimension.

Automated online interactive activities

Automated online learning activities may be provided for student learning to support repeated practice and feedback (behaviourist) type learning providing optimal conditions for the learner to receive and process information (cognitivist). Activities may include multiple choice questions, open-ended questions and matching activities (e.g., labels to pictures). A lecturer teaching specific discipline related concepts to first year undergraduate students may require them to complete a series of online activities (Scott and Judd, 2002). The activities may start with an introduction supported with graphics and other media of the concept or problem to be examined, a demonstration of how the problem may be solved, followed by an activity which allows the student to attempt a similar problem. After entering an answer, the student is automatically provided with appropriate feedback as well as adding or deducting marks for correct or incorrect answers respectively. The sequence of completing each online activity may be predetermined, not allowing students to move on to the next questions until the current problem has been solved. Automated online learning activities may also be provided as a non-assessable, non-compulsory and non-linear supplement to the students' learning experience. Online quizzes may be provided for students to reflect upon their learning to reinforce key concepts, which may also assist with examination preparations. Automated online activities should operate efficiently with off-campus computers and slow Internet connections. Slow loading pages should be minimised and timed logout functions be used appropriately to allow students time to consider their answers. The varying application of automated online learning activities may be represented along a dimension as illustrated in Figure 21.

Internet-based information

Purposes for encouraging students to search for specific Internet-based information to foster deeper understanding of the subject matter may vary. A lecturer teaching law may require students to find specific information about a particular case study obtained from a government website in order to complete an activity. Students may also be required to find similar case studies on the Internet and employ effective online search strategies (Harris, 1997). In this case, students are provided with specific links and are guided with finding specific information, as well as providing access to online resources which are useful for their future employment. A postgraduate student involved in research may search for information through a variety of online resources including online journals and scholarly databases. Students and lecturers may post useful URLs to relevant websites which they have encountered on the class bulletin board for other students to access. Figure 22 illustrates the varying amount of teacher guidance provided with finding specific information on the Internet as represented along a dimension.

Feedback and evaluation of e-learning

The ongoing development cycle of an e-learning environment, as with all other learning environments,

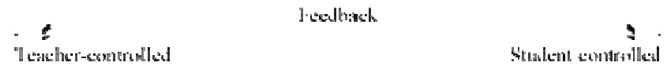

Figure 23. Pedagogical dimension for feedback

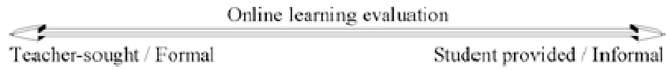

Figure 24. Dimension for online learning evaluation

needs to include an evaluation process to determine and maintain the effectiveness of the system. Davis (2004) suggested that this should be based on the achievement of the learning outcomes and on students' feedback. In turn, lecturers can assist students with their learning through providing appropriate support and feedback to students during their online studies for enhancing their learning. The following discusses how feedback can enrich students' online learning experiences, as well as how students' evaluation of their online learning experiences can feed back into the ongoing development of the online learning system.

Feedback

Students are increasingly expecting more reliable and valid assessment with prompt feedback on their performance. The amount and type of feedback students require will vary depending upon student need and level of engagement with the learning materials. A postgraduate student working on a doctoral thesis will usually ask for feedback as required and may initiate online contact with other postgraduate students regarding issues relating to their enquiry. A first year student studying an undergraduate unit will require feedback relating to the subject matter and more likely, assignment requirements. The lecturer, throug h the encouragement of specific learning strategies, may control the feedback provided to these students. Students may be provided with the flexibility to submit their assignments either by the Internet or by other means such as post with prompt notification of receipt of their assignments. Assessed assignments should be promptly returned with well considered feedback. Figure 23 illustrates the varying pedagogical approaches towards feedback.

Online learning evaluation

Information collected about the learning environment through a formative evaluation process can be used to revise this environment for efficiency and effectiveness (Dick et al., 2005, p. 278). The continuing development of online learning environments can benefit from students' evaluation comments regarding their experiences. A lecturer with a first year undergraduate class may ask students to complete a unit evaluation form which may contain questions regarding the strengths and weaknesses of their website. The comments collected from the evaluation form, in conjunction with comments from other sources such as the bulletin board, may contribute towards improvements of the online learning environment for future cohorts of students. A lecturer with postgraduate students studying entirely online may email each student once or twice throughout the duration of the unit asking them to provide comments regarding their progress and the effectiveness of the online learning environment. The amount of formal and informal online learning evaluation sought from students regarding the effectiveness of their online learning experiences may be represented along a dimension as illustrated in Figure 24.

Instructional design for online learning model

The 24 recommendations above need to be considered at the design phase of teaching materials to consider what role online learning will have with the delivery of the unit. This will vary depending upon a number of factors including the skills and knowledge of students, the selection of pedagogical approaches the learning context and mode of delivery, instructional strategies, the role of the educator, and the method of evaluation. The instructional design for online learning (IDOL) model presented in Figure 25 is an adaptation of Reeves and Reeves (1997) model of ten pedagogical dimensions for web-based instruction. The pedagogical dimensions provided a means of accommodating the wide range of pedagogical needs of online learning which exists in higher education. The IDOL model enhances and extends Reeves and Reeves ten pedagogical dimensions to 24 dimensions. The IDOL model presents these 24 recommendations (and dimensions) as elements within a typical systematic instructional design framework to assist with the instructional design analysis of an online unit. Each of the 24 elements in the IDOL model has been numbered to correlate with the 24 figures presented in the previous section. To demonstrate the application of the IDOL model's 24 elements, the design and analysis

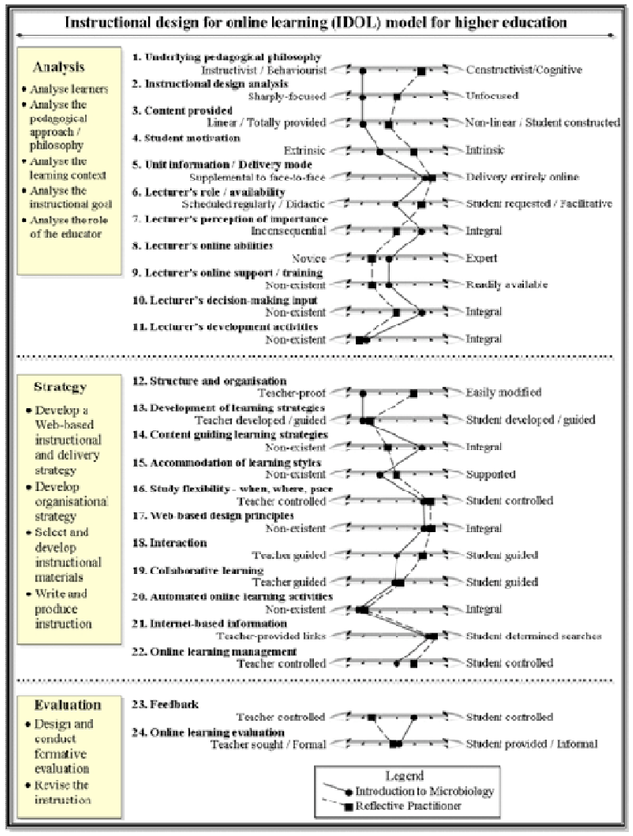

Figure 25. Instructional design analysis for two units using the online learning (IDOL) model for higher education

of two sample units are presented here. The two units differ in their pedagogical approaches, lecturer requirements, and lecturer roles. The first sample unit is called *Reflective Practitioner*. This unit is delivered in the Bachelor of Arts (Training & Development) within the Department of Education at Curtin University of Technology. This unit is delivered in distance education mode and is provided entirely online. After students have completed some preliminary activities, principles of action research are applied as the learning strategy and students are encouraged to be self-directed through inquiring areas of interest. The targeted students are adult learners employed as lecturers, trainers, community program developers or facilitators.

The second sample unit is called *Introduction to Microbiology* from the School of Biomedical Science at Curtin University of Technology. It is part of the undergraduate human life sciences program which is delivered via the Open Learning Australia (OLA) portal (http://www.ola.edu.au). This unit is delivered entirely in external online mode for off-campus students and is supported with additional materials, including a biomedical practical kit and a CD-ROM. These materials are posted to students to allow them to complete the required practical assignments for each of the modules from home.

Figure 25 illustrates the design analysis for both units using the IDOL model. They are illustrated on the same figure to show how the IDOL model can accommodate online units with varying instructional and pedagogical needs. The positions (ratings) along each pedagogical dimension shown in Figure 25 have been determined by the author. They have been influenced by the author's involvement with other instructional designers in the online development of these units, as well as several discussions with the units' lecturers. The rating method is not unlike the method used by Reeves and Reeves (1997).

Conclusion

The IDOL model presented above incorporates findings from a PhD study (Siragusa, 2005) in the form of 24 pedagogical dimensions. This model accommodates the various students' pedagogical and delivery needs which occur in higher education. While the IDOL model is presented within a typical instructional design format including the analysis, strategy development and evaluation phases, it is not designed to replace any particular instructional design model. It is designed to work alongside other instructional design models (Dick et al., 2005) in order to ensure that decisions made at the instructional design phase take into account decisions which are specific to the development of pedagogically effective e-learning environments. As with Reeves and Reeves' (1997) model, the IDOL model should not be considered comprehensive and complete. While the development and utilisation of online learning technologies continues to grow to include more sophisticated virtual environments for learning (e.g., Yellowlees and Cook, 2006), the pedagogical dimensions presented here will undoubtedly need ongoing revision that is informed by ongoing research into quality e-learning.

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Current Practices and Needs Assessment of Instructors in an Online Masters Degree in Education for Healthcare Professionals: A First Step to the Development of Quality Standards

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Abstract

Instructional quality of online delivery is still a common concern. Quality assurance requires a comprehensive framework of several perspectives of learners' and instructors' needs including critical analysis of their teaching and learning practices with the course technology platform. Using online surveys and semi-structured interviews with 10 instructors and 29 students, this case study investigated current instructional practice, needs, and achievements of the instructors and students in an Online Masters Program for Healthcare Professionals. Although the findings indicated little real concern about the program quality, a majority of our instructors and students still believed that initiating specific course design and teaching standards in our program would maximize instructors' and students' performancein our future courses. The process we followed in this study encouraged a helpful dialogue about program expectations, including training expectations of instructors and course design/development and teaching standards (best practices) for the online master's program. We became more conscious that applying standards successfully requires more support from the instructors.

Online education places new demands on faculty, most of whom come to this new environment predominantly with classroom teaching experience. Few have experienced online courses as either instructor or student. Faculty are accustomed to functioning independently in a traditional classroom environment – developing courses without assistance from others and managing the classroom on their own. Requirements are different in an online learning environment, where consistency and organization are important to ensure a quality experience. In order to provide training and on-going support for instructors, we must approach online teaching and learning in a more global and systemic manner as we plan quality standards.

The use of high quality instructional and course design standards by instructors in online learning has numerous benefits, but not without some difficulties. Moving from traditional methods of teaching to online delivery methods of instruction is challenging due to the dramatic shifts in the perspectives of both the instructors and learners (Dringus, 2000). In this respect, most educational institutions are creating or adopting quality statements, standards, or criteria regarding their web-based distance learning programs. These standards are commonly written as

a faculty guidance manual, which typically covers issues such as the process of course proposal and approval, evaluation and assessment, expectations and requirements, and best practices in online teaching. Some address enrollment caps, teaching loads, and legal issues. These guidance documents are mostly based on university-wide standards and are not program or discipline specific.

National initiatives have been developed in some institutions to provide a consistent approach to assuring quality. One such program that has been developed for online courses is the University of Maryland's "Quality Matters" project (http://www.qualitymatters.org). This project was developed as an inter-institutional quality assurance and course improvement process to certify online courses and components. Several annotated rubric tools were created to assess areas such as 1) overall design of the course website including navigational features; 2) use of learning objectives; 3) assessment strategies, policies, and tools; 4) instructional materials and resources; 5) learner interaction; 6) course technology; 7) learner support; and 8) accessibility. Frydenberg (2002) summarized current published quality standards for electronic learning and organized them into nine domains: 1) executive/institutional commitment; 2) technological infrastructure; 3) student services; 4) design and development; 5) instruction and instructor services; 6) program delivery; 7) financial health; 8) legal and regulatory requirements; and 9) program evaluation. Others have defined a quality framework based on the similar concepts and have developed metrics to support quality learning environments and quality management. Examples are 1) the Sloan Consortium quality framework and five pillars of quality online education (Lorenzo & Moore, 2002; Moore 2005), 2) seven principles of effective education in technology based education (Chickering & Gamson, 1987; Chickering & Ehrmann, 1996), 3) guidelines for identifying and evaluating web-based courses (American Distance Education Consortium -ADEC), 4) Guiding Principles for Distance (http://www.adec.edu/admin/papers /distance-teaching_principles.html), and 5) twenty-four quality assurance benchmarks in the web-based learning environment described by Yeung (2002).

Different groups have provided varying perspectives about standards, quality, and evaluation of online instruction. Some of these provide checklists for review of the courses, peer review teams, or rubric tools as mentioned earlier. Most of these tools or approaches to assess quality of online coursework have merit in some specific areas, but online programs require more comprehensive course design and instructional standards. These standards should address distance education pedagogy with specific emphasis on instructional strategies designed to foster interaction, convey concepts, and assess student learning. Standards must provide guidance to the instructor in translating face-to-face courses into the distance delivery mode in order to achieve specific learning outcomes.

The purpose of this research study was to describe current practices, needs, and achievements of instructors and students in an online masters degree program. Since the faculty in this program developed their own courses and instructional materials, examination of the course design and teaching approaches was necessary prior to initiating standards for quality assurance. The primary research question for this study was: What are the current practices, needs, and achievements of instructors and students in the online masters program? Around this focus were the following sub-questions which guided the subsequent development of standards and best practices for online teaching in the master's program:

- How do program instructors use Blackboard to design and manage their courses?
- What options in online teaching and learning are not supported by Blackboard?

- What additional support or technological features are needed for both students and instructors?
- What instructional approaches and activities should be employed to promote online teaching and learning?
- What types of course design and instructional approaches are effective from the students' and instructors' points of view?
- What quality indicators do instructors use to develop and teach their online courses?

Background Information

The Online Master's Program for Healthcare Professionals has been offered nationally and internationally since 2002. This advanced, graduate level program was developed as a joint project between the University of Cincinnati College of Education, Criminal Justice, and Human Services and Cincinnati Children's Hospital Medical Center. It targets full-time, working physicians and other health care professionals who wish to pursue careers in medical education. Three educational themes - adult learning, curriculum and instruction, and educational research and evaluation - are the focus of this 45-credit hour program. This program is offered entirely online, allowing full-time working medical professionals the opportunity to access classes around their work schedule.

The curriculum consists of twelve core courses, an elective, a practicum, and a master's project.

Full-time and adjunct faculty of the College of Education teach courses in the program so that healthcare professionals can learn educational pedagogy from educational experts. The faculty in this graduate level program developed their own courses including course materials. Due to budget issues, we were not able to provide formal faculty training on how to teach online or how to use the course platform effectively (Blackboard). However, the first author of this paper, who has had extensive distance learning and computer-based learning experience, oriented each of the faculty one-on-one to the online teaching and learning environment.

Methods

This study used a mixed methods design with both qualitative and quantitative study approaches. The combination of these two methods strengthened and deepened the analysis via triangulation (Johnson & Turner, 2003). The quantitative part of the study examined the students' and the instructors' practices on the course platform (e.g., the Blackboard tools) as measured by using the frequency scale ranging from 1 (never) to 4 (regularly). Qualitative methods were used to obtain more descriptive information by focusing the perspective of participants (Bogdan & Biklen, 1998).

Setting and Participants

The setting for this study was a fully online program from the University of Cincinnati. The student enrollment at the time of this study was 65 medical professionals**.** Instructors communicated with students via Blackboard 5.5 and online synchronous meetings via WebEx, an internet-enabled conferencing tool.

The participating instructors had extensive prior face-to-face teaching experience, but few had online teaching experience when they began teaching in our program (years of teaching in the Online Master's program ranged from two to eight years). Ten instructors (five females and five males; one Asian and nine Caucasian; aged 31 to 60 years) and 29 students participated

in the online survey portion of the study. The semi-structured interviews involved the participation of nine instructors and eight students (four females and four males; one Caucasian/Hispanic, five Caucasian/non-Hispanic, one African American; aged 39 to 53 years). Students were selected based on their academic performance. The online students that were interviewed by telephone were living in the United States, Canada, and Puerto Rico, and had attained various levels of education in health areas (from bachelor's degree in health information management to doctor of medicine with additional subspecialty training) and occupational backgrounds in healthcare (course facilitation, drug and poison counseling, neonatology, pediatrics, dermatology, surgery). Student participants were in various stages of the master's program.

Data Collection

Data were obtained through online surveys and semi-structured interviews of instructors and students during the period from August through December 2007. Approval was obtained from the Institutional Review Board of Cincinnati Children's Hospital Medical Center.

Online surveys. Both the instructor and student surveys were developed by two of the authors (KOL and RCB) of this paper. The survey questions explored areas that were grounded in the literature as well as the Blackboard tools utilized in the online environment. Both surveys were examined by two content experts and a psychometric expert who suggested some modifications that were implemented. Later, the instructor survey was administered to the three external faculty members to determine whether the items were clear and concise. The same procedure was applied to the student survey by administering to six individuals in a graduate level course.

The instructor survey had 86 questions and the student survey had 57 questions addressing the areas of Blackboard use, course content and design, quality standards, and future needs. Both instructor and student surveys contained various question formats, such as frequency scale (regularly, occasionally, seldom, never), open-ended, and close-ended (e.g., multiple choice and multiple answers, yes/no questions that probed explanations by asking why, why not, how, in what way, etc).

Semi-structured interview question. Both the instructor and student interview questions were developed by the first two authors and paralleled the online survey questions and research objectives. The instructor interview tool consisted of a total of 19 questions (Background Questions - 6 questions, Global Questions - 7 questions, and Focused Questions - 6 questions), and the student interview included a total of 15 questions (Background Questions – 4 questions, Global Questions – 6 questions, and Focused Questions - 5 questions). Face and content validity of the interview questions were obtained through a peer review process.

Other documents. Other documents included all of the course syllabi and some of the course materials.

Both the instructor and student surveys were placed online using SurveyMonkey, a web-based tool to create/publish custom surveys, and to collect/analyze results in real time. The survey link was emailed to all instructors and the students. Two reminders were sent via email.

Semi-structured interviews were conducted with the course instructors and the students to obtain more detail about individual thoughts and feelings. We used two different methods in conducting semi-structured interviews: in-person interviews (instructors) and telephone interviews (students). Telephone interviews were conducted with the students because of distance issues.

Data Analysis

Quantitative data were analyzed through the statistical software package SPSS (descriptive statistics - mean, standard deviation, and t value). Descriptive statistics were calculated for the scale scores (e.g., frequency and percentage of answer for each of the questions of the survey). Open-ended responses in the survey were analyzed thematically (Neale & Nichols, 2001; Shank, 2006) using taped interview data that had been transcribed verbatim. The instructors' and students' survey data were triangulated with the interview data to provide a more powerful interpretation of instructor and student perceptions of the important key issues in online teaching and learning.

Analysis of qualitative data included coding of categories, which is the heart of grounded theory analysis. Codes identifying key words or labels were attached to appropriate words, phrases, sentences and whole paragraphs (Miles & Huberman, 1994). This permitted the creation of a concept map linking key factors and their relationships. Three major types of coding (open, axial, selective) proposed by Strauss (1987) and Strauss and Corbin (1990) were used. Open coding allowed development of categories of concepts and themes emerging from the data without any prior assumptions. Axial coding facilitated building connections within categories. Selective coding allowed choosing one category to be the core category and relating all other categories to that category. The third author analyzed data as an external data coder for the qualitative data. The purpose was to achieve high inter- and intra-coder reliability. In addition, data and methodological triangulation were applied to all categories obtained from the instructors and student responses.

In addition to survey and interview data, we analyzed some of the course documents and artifacts (e.g., course syllabi, instructional materials and course content). These data sources provided evidence of pedagogical and course design approaches used by the instructors as well as their actual course practices.

Results

The analysis of the data revealed the following themes:

Course Platform Technology (Blackboard)

Instructors' and students' experience with Blackboard. Instructors' experiences with the current course platform varied from two years and more. Most of them had learned the basics of Blackboard by attending the university sponsored training and/or received help from someone with Blackboard experience. A few were self-taught and used online tutorials to figure out the capabilities of the specific tools in Blackboard. Students' experiences varied from less than a year to three years. Eighty-six percent of students had not taken any online courses, and 89% had not received Blackboard training previously. Their first encounter with the Blackboard system started when they received the program orientation, which included basic features of Blackboard and course expectations.

Overall, the data indicated that both the instructors and students found Blackboard to be a flexible, useful, effective, user-friendly tool in aiding their teaching and learning, even for a computer novice. They also thought that this platform accommodates different kinds of teaching styles and learning preferences.

Instructors' and students' practice on the course platform. Using the basic features of Blackboard, all the instructors were able to create a positive instructional environment by posting syllabi and course materials, posting weekly discussion questions (feedback and interaction), providing references to external web links, and utilizing email (Table 1). Eighty percent of the instructors were not able to use the advanced features of Blackboard such as assessment tools (tests, survey, and grade book) and course tools (chat, calendar, file share, digital drop box, and electronic board). However, they indicated that they were slowly exploring some of the advanced tools in Blackboard. According to the survey results, only four instructors (40%) requested training on specific tools such as connecting to library resources, grade book, group pages, testing strategies, group work, and other high-end operations. During the interviews, the majority showed an interest in a refresher course on all the features/tools available in Blackboard and how they can be used. Syllabus design, innovative teaching strategies, and peer interaction approaches were subjects most requested by instructors for further training.

Most of the responses from the students and instructors regarding the use of Blackboard tools were in agreement except for the communication tool (email use) and the course tools/student tools (Digital Dropbox, File Share, Calendar, Tasks, and the Electronic Board - $p = 0.05$).

Differences in the use of those tools were related to the roles and responsibilities of each group. For example, the administrative tool (Calendar/Task) for deadlines was not frequently used; instead the instructors provided important dates through emails and the announcement page. Students mostly use their own email programs rather than the email system built into Blackboard. On the contrary, instructors reported that it was convenient to send group or individual emails through Blackboard since all the students' email addresses and names are available within the system and they did not need to create their own distribution list using their own email program.

The survey results showed that all the instructors reported that they informed students about the presence of new materials on Blackboard by means of both announcements and email, which was corroborated by the student survey.

Table 1

Use of Blackboard Tools

Instructor Survey Question: How often do you use the following Blackboard tools in your teaching to online master's students?

Student Survey Question: How often have you used the following Blackboard tools in the courses you have taken so far?

Blackboard Tools	Respondent	N	Mean*	S.D	t-value
File Share	Students	28	2.54	1.07	4.20**
	Instructors	10	1.30	0.67	
Course Calendar	Students	28	2.36	1.13	3.50**
	Instructors	10	1.30	0.67	
Tasks	Students	28	2.43	1.20	4.67**
	Instructors	10	1.20	0.42	
Sending email	Students	29	2.72	0.96	-5.75**
	Instructors	10	3.90	0.32	
Electric Blackboard	Students	28	1.71	1.08	3.49**
	Instructors	9	1.00	0.00	
Announcements	No significant differences between instructor and student responses.				
Course Documents					
Course Information					
Assignments					
Staff Faculty Information					
Discussion Board, Groups					
Group Pages					
Learning Units					
Personal Pages					
Web Resources External Links					
Collaboration Tools/Chat					
Digital Drop Box					
Tests/Quizzes					
Surveys					
Grade Book					

* Based on frequency scale where 4 = regularly and 1 = never
** $p<.0.05$

Course materials and discussion boards were perceived as being highly relevant tools. Discussion board activities were the students' favorite activities. In addition, both the instructors and students perceived that most of the tools on Blackboard course management can support active leaning, collaborative work, communication skills, critical thinking, and evaluative skills. All those tools were cognitively stimulating and gave them opportunities to gain knowledge, read, write, and reflect as they interact with course content.

Blackboard limitation. A few instructors identified limitations of the Digital Dropbox as not being intuitive, confusing to some students, and not visible to the other students' submissions. Other least favorite features included the following:

- Subject-specific things such as mathematical equations and characters can be difficult to communicate (especially the older version of Blackboard).
- The course shell in Blackboard permits little customization by the instructor, limited to changing the menu style and color and adding a banner.
- The sender's copy of e-mail messages in the email track feature does not reflect the address to which it was sent. That is, the sender's name appears in both the "To" and "From" lines.
- When a test is copied from one course to another, the item order is altered.

The instructors also reported on some of the things they were not able to do in Blackboard, such as:

- Automatic grading of open-ended response
- Assign partial credit to an alternative logical answer in a multiple-choice question.
- Formatting email messages (the plain text messages are often boring and difficult to read).
- Drawing
- Podcasting
- Audio and video conferencing integration (The Elluminate Live! online conferencing tool is now available)
- Voice communication - real time chats on line (Blackboard has virtual classroom, but it is not voice integrated).

Course Design and Content Development

All instructors designed their online courses to accommodate their own teaching styles and course content. Before they developed their courses 80% had read about how to design effective instruction for online classes. Fifty percent created an entirely new course for online delivery while 50% adapted a current face-to-face course for online delivery. Thirty percent redesigned a current course to take advantage of online tools. Only one instructor co-developed the course with a co-instructor when teaching for the first time. One instructor consulted an e-learning expert and added hands-on activities to take the place of activities an instructor would normally do in the classroom or in small groups.

All instructors developed their course syllabus, weekly outlines, and/or lesson plans, including their own course materials, but a few instructors created their teaching materials collaboratively with the aid of technical support from their departments. One brought in finished supplemental materials (e.g. CD-ROM). The course syllabi were the main medium to state the instructors' expectations and the course requirements, although the content of the syllabi was variable. As for the instructional materials, most of them consisted of text-based materials, pdf articles/handouts, and PowerPoint presentations. These were the regularly-used content-focused

materials, which students found very useful for their learning purpose. A few students noted that PowerPoint presentations with narration, videos/animations, and videoconferencing would be helpful, especially when communicating the core concepts in certain subjects. The interview data also confirmed the same results. A few instructors had provided audio-feedback, but due to recording quality the students did not like them.

Eighty percent of instructors self-reported that they understood the intellectual property rights pertaining to their online course materials, but only 30% of them had checked and cleared their online materials for the copyright infringements. However, 90% of the instructors knew the appropriate source of information on the topic.

Blackboard Teaching and Learning

Instructional approaches. Instructors' instructional approaches and activities included giving positive feedback, making the material applicable and relevant to the students' lives, creating an environment for questions to be asked and answers to be discussed, requesting honest reflection from students, requiring accountability for assignment deadlines, and building on small successes toward targeted goals. Seventy percent of instructors provided discussion board forums for different types of communication (e.g., "Water Cooler," "Course Issues," "Ask the Instructor," "Student Feedback," "Reflective Journal," and "Course Design").

All the instructors monitored students' use of Blackboard, although the methods of monitoring varied from reading student posts and keeping track by hand to electronic monitoring using the Blackboard tool (performance dashboard). While 45% of students did not know of a mechanism to allow an instructor access to or capture of information regarding their individual performance in the course activities, 55% of students were aware of the instructors' tracking and measurement strategies of their progress.

Instructors expressed the challenges of their teaching as time commitment, student diversity, keeping up with technology, and absence of best practices for using Blackboard. Student challenges included not enough advising and feedback from instructors as well as from fellow learners, and a preference for assignment of short projects instead of one long project. Student interviews revealed that students were more satisfied with the structured courses that use clear expectations, weekly outlines, assessment rubrics, application-level project examples, and more interaction with peers and instructors.

Group and discussion board activities. Sixty percent of instructors incorporated group work activities into their courses. The student survey results confirmed this by providing specific names of the courses and instructors. Ninety percent of instructors promoted peer interaction through discussion board activities, mandatory weekly participation/peer feedback requirements in assessment criteria, group work opportunities, and collaborative projects. All students reported that they had sufficient peer interaction in their courses.

Assessment and rubric. Most instructors (80%) and students (73%) reported that assessment of online activities occurred. Students reported that instructors tracked and evaluated student interaction by using a checklist of participation, a rubric (e.g., frequency of contributions, originality/impact of ideas in enhancing the quality of discussions, and overall responsiveness to others), monitoring the discussion forum closely, and sending private email to students whose interactions are problematic.

Ninety percent of instructors facilitated discussions online using multiple methods:

- Participation with comments on various discussions and encouraging further discussion through questioning and scaffolding

- Posting more specific questions for discussion among class members
- Posting a weekly question (referred to by the instructor as a "jumping off" point)
- Responding to students who were not getting adequate responses from classmates
- Highlighting some item (like a student's posting) that had been neglected, but was worth considering

Although approximately half of the students did not think the instructors facilitated the student interaction online, 52% agreed that their instructors assisted and facilitated the discussion board activities using the methods mentioned above, including providing insightful questions or reflective statements. One student commented:

> *Some are better than others; some simply monitor and provide a summary at week's end, while others engage in interaction and facilitate the discussion, which I think is much better. While I am a fan of self-directed learning, I think some instructor input is beneficial. We are paying for their expertise...*

Students indicated that online courses required too much time spent reflecting on someone else's response to a question as opposed to seeing how the instructor, who is teaching the concept, would react to the responses.

Instructors' use of rubrics and assessments, such as assignments, quizzes, and exams, was variable. Some instructors subjectively evaluate the discussion forum to show "that they [students] are reading and understanding the material in the book and are able to apply it to things that they are involved in."

Instructors' future plans on the use of Blackboard. Instructors identified their need to improve their courses and highlighted the importance of effective time and classroom management issues. One instructor emphasized that online teaching seemed to take more time; therefore, more organization and better time management strategies were needed. They felt that responding to every posting was not effective time management and only served the purpose of demonstrating their online presence to the students.

One of the instructors noted that students appreciate regular communication and timely written feedback on their progress, which required developing a faster and more detailed feedback mechanism. Another instructor was always looking for opportunities to relate course materials, teaching techniques, and ideas to the students' work lives. One instructor stated "that many students are looking for an online community - for support, for humor, for reflection." Another commented:

> *Be prepared to spend a great deal of time responding to student work -- both their written assignments and their discussion board participation. They know exactly when and how much you are on Blackboard and they know exactly how long you take to respond to their written work. They also know and appreciate the difference between "generic" responses and detailed, individual responses.*

Quality Assurance and Standards

Perspectives on quality assurance. Half of the instructors believed there should be standards or guidelines for teaching courses on Blackboard for the Online Master's program. Half were unsure or had mixed feelings. The students likewise had mixed responses to this question with two thirds finding merit in guidelines. However, 56% of instructors and 64% of students believed that having instructional and course design standards for this program would be helpful for more standardized instruction. Two-thirds of the students believed that all instruction in the online courses should be conducted using the same standards for consistency

and quality assurance. Instructors looked at the quality issues from different perspectives, including standards as a means of quality control, caution against rigid standards that would hamper creativity and innovation, and selection of a few exemplary courses to aid in course development.

Course design and instructional standards. Some instructors emphasized that standards would give more rigor to any program and incorporating instructional design standards would help increase the general quality of the masters program. In general, most of the instructors were in favor of incorporating instructional standards into their courses on the condition that they are able to maintain some individuality in course design and teaching practices. They felt that course design should vary with the instructor and the course content to avoid being rote and boring for the students. One of the students' comments confirmed this concern by saying:

> *There has been a variety of ways that instructors have used blackboard and various different criteria between what is expected in each class I have taken. I like the variety and the uniqueness that each instructor brings to each class, and, as long as what is expected is outlined initially, I think that if each course were set up similarly, it would be less interesting.*

In general, students expressed satisfaction with the courses. Most of them indicated that some instructors are better at online instruction than others and that standards would improve the quality of instruction across all courses. They felt that each course should have standards to improve consistency and appearance/structure, but should not limit the instructor's ability or dictate what the course should look like (e.g., diversity makes the program interesting). A few of the students stated that the standards should be used with great caution so as not "to squelch creativity among the faculty." To ensure course quality, they felt the following standards would be important and ensure the educational value of the activities:

- Consistency in the amount of work on the discussion board and amount of required reading
- Consistency in location of syllabi, weekly assignments, and course submission sites
- Rubrics should be posted so students know what to expect, but each professor should be in charge of creating their own rubric according to his/her expectations and feedback from prior classes.

Discussion

Instructional quality is still a concern in online learning. Although several studies on the quality of online learning have been conducted, the factors that contribute to success in online learning have not been adequately described. The literature has described several online education courses that failed to meet quality standards set by researchers and institutions (Garrett, 2004; Oliver, 2005; Zhao, 2003). On the other hand, Yang and Cornelious (2005) questioned the quality of instructors who teach online courses. Many studies used multiple perspectives to evaluate quality, such as student grades and test scores, attitudes, absence of face-to-face interaction, faculty experiences, student satisfaction, accessibility of course material, and the ease of using technology (Thurmond, 2002). The Institute for Higher Educational Policy (2000), in examining case studies of six college and university web-based programs, developed 24 benchmarks that are essential in ensuring quality in Internet-based distance education. The benchmarks focus on (a) student, faculty, and institutional support, (b) course development, (c)

teaching/learning, (d) course structure, and (e) evaluation and assessment. In order to obtain evidence to increase the quality of online education, the combination of instructional design, course structure, teaching pedagogy, technology, and instructor/student support systems should be examined to see their effects on student success in an online environment.

In the current study we focused on the instructors' and students' current instructional practice on the technology of the course platform, including instructional strategies, course design, and the needs of faculty and students. This process encouraged dialogue about program expectations, including training expectations of instructors and course design development and teaching standards (best practices) for the online master's program. Our instructors were confident that their instructional goals of communicating content to students were met through their ability to post their course documents, provide discussion questions, and post grades on Blackboard. However, it is clear that they need on-going support for various levels of technology training, not just in the initial stages of course development.

Quality is a continuous learning process and requires frequent adapting of best practices to meet the needs of our program instructors and students. In general, our instructors agreed on the importance of quality standards based on best practices as a means of improving the quality of their work. They even suggested some resources such as participating in Quality Matters (QM) Standards (http://www.qualitymatters.org), which is a faculty-centered, peer review process designed to certify the quality of online courses and online components. Other resources that are available include Chickering and Gamson's (1991) seven principles of good practice in teaching-learning, North Central Association of Colleges and Schools Guidelines for Distance Education (http://www.ncahlc.org/), Ohio Learning Network (http://www.oln.org/), and the Western Cooperative for Educational Telecommunications (WCET): Best Practices for Electronically Offered Degree and Certificate Programs (http://www.wcet.info/2.0/).

A limitation of this study was that it investigated a small program with instructor and student perceptions of only one online platform (Blackboard). Because this study involved students in online classes of different subjects with different instructors who have varied teaching preferences, the Blackboard implementations may have been affected. It is possible that if there are problems with the implementation of a course tool, student perceptions will be adversely affected and these perceptions will negatively affect the outcome of this and future studies. For example, if the course tool is not used by the instructor effectively, students may not use it. Standards should only be used to enhance the course and ensure the educational value of the activities without regard for the teaching platform.

Conclusions and Recommendations

The results of this study have significant implications. If our courses are to be brought to a uniformed quality structure using instructor best practices, we should adopt or develop a workable set of guidelines and benchmarking that describes critical elements of effective learning. The following recommendations, based on our study and published research in online learning, may help devise a successful plan in order to develop and infuse quality standards for online coursework:

1. Provide a measure of the quality of existing course materials as well as provide a guide in the development of new materials or modules.
2. Use a sample course and materials as a template or foundation on which instructors can build a new course, customizing it as necessary. The template provides the basic course

structure and navigation, introductory information modules, and suggestions for content to enhance the course site. Using the template also speeds up development time and may also facilitate the course development process for new online instructors - for example, a course syllabus template that shows all the key components and content areas in detail.

3. Develop a strategy that will provide continuous support and evaluative feedback and self-criticism for self-improvement of the instructors. One approach would be to use validated published rubric tools such as QM standards that will help assess current course design (needs assessment) in order to highlight quality issues from several perspectives. Assessment can be self-assessment, peerassessment, or supervisor assessment based on these rubrics.
4. Provide resources and training opportunities for instructors to help them create an online learning community through a permanent online program orientation course and to support them monetarily to participate in existing online teaching certification programs.
5. Use published quality standards such as those of Frydenberg (2002) to aid assessment and serve as a framework for guideline development.
6. Develop a viable relationship with the instructors, and pursue a bottom up approach so the impetus for implementing standards comes from the instructors.

Overall, the findings of this study are promising for initiating specific standards in our program in order to maximize instructors' and students' performance in the future courses. The instructors' and students' perceived quality indicators will assist us in making informed decisions about the quality of our program courses. The biggest challenge is designing standards without being rigid or prescriptive. However, by providing one-on-onehelp to our instructors, this process can be informative, helpful, and constructive.

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Using Collaborative Course Development to Achieve Online Course Quality Standards

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Abstract

The issue of quality is becoming front and centre as online and distance education moves into the mainstream of higher education. Many believe collaborative course development is the best way to design quality online courses. This research uses a case study approach to probe into the collaborative course development process and the implementation of quality standards at a Canadian university. Four cases are presented to discuss the effects of the faculty member/instructional designer relationship on course quality, as well as the issues surrounding the use of quality standards as a development tool. Findings from the study indicate that the extent of collaboration depends on the degree of course development and revision required, the nature of the established relationship between the faculty member and designer, and the level of experience of the faculty member. Recommendations for the effective use of quality standards using collaborative development processes are provided.

Keywords: Course development; course development team; online course quality; quality standards; instructional design standards; distance education; online learning; online education

Introduction

The issue of quality is becoming front and centre as online and distance education moves into the mainstream of higher education (Sloan Consortium, 2004). Recent studies have determined that regarding students' academic performance, online learning can be as effective as face-to-face learning and, in some cases, more effective (Sachar & Neumann, 2010; Tsai, 2009; U.S. Department of Education, 2009). Despite these promising and illuminating findings, universities and colleges that offer online programs must reassure various stakeholders, including learners, that engaging in online studies will be an effective and rewarding learning experience and that they will acquire the necessary skills and knowledge a particular program promises to deliver. To help provide these reassurances to stakeholders, many institutions and regional bodies have developed or adopted quality-related principles or standards that serve to define quality, but the

debate remains on how to best assess quality when the new forms of education are emerging and changing rapidly (Middlehurst, 2001).

Royal Roads University (RRU) is one such institution offering applied and professional programs that feature substantive online study. Combining face-to-face residencies of one to four weeks with online courses in a cohort model, RRU's programs have attracted many learners who appreciate the flexibility of a mixed model of delivery, especially if they are continuing to work full-time while taking a degree or certificate program. With over 600 courses being developed or revised annually, Royal Roads University needs to use a systematic approach to course development. All faculty members, including contract instructors, are supported by instructional designers in a centrally operated unit called the Centre for Teaching and Educational Technologies (CTET). This means each course must be designed and developed under the guidance of an academic lead and an instructional designer to ensure alignment with program outcomes and the university-wide instructional design quality standards, compiled and published by CTET in 2004 (Chao, Saj, & Tessier, 2004; see Appendix A). These standards consist of criteria related to learning outcomes and instructional strategies.

The instructional design quality standards have served primarily as a formative tool, with the use of the standards varying from one instructional designer to another. In addition, since the release of the quality standards, the University has formalized its curriculum and course quality assurance process by creating a university-wide, peer-based curriculum review and approval process, administered by the Curriculum Committee. As a result, it became necessary for CTET's instructional design process to be aligned with this new process. A close examination of the course development process with the use of the instructional design quality standards is crucial in mapping a path forward to enhance the design and development of high-quality courses.

Literature Review

In most conventional higher education institutions, course design and development is accomplished by individual instructors. They draw up their course outlines based on their knowledge of a subject, without significant assistance from other university staff members. Thus, overall, the process of developing courses in higher education is a solitary one without consultation. The emergence of distance and online learning has contributed to a change in this process. A shared process of course development, referred to by Daniel (2009) as an industrial model of labour division for course development, has emerged in many higher education institutions. Instructional designers and technical personnel take part in the design and development of courses while instructors provide the subject matter expertise.

Instructional designers in CTET, like many practitioners in the field, advocate a collaborative course development model for quality online learning (Kidney, Cummings, & Boehm, 2007; Oblinger & Hawkins, 2006; Wang, Gould, & King, 2009). The main argument for adopting a collaborative development model is that designing a high-quality online course requires various sources of expertise not usually possessed by one person. Quite often, the development of an online course takes longer than the development of its face-to-face equivalent and requires the

rethinking of pedagogy (Caplan, 2008; Knowles & Kalata, 2007). Proponents of distance and online education argue that the "lone ranger" model, in which an instructor learns how to design and teach an online course by him or herself, is not scalable and does not lend itself to the diffusion of innovative practice in an organization (Bates, 2000, p. 2). The days of the star faculty member who can do it all are long gone. Staff with instructional design expertise, technical knowledge, and subject matter knowledge must collaborate to produce quality courses on a consistent basis (Oblinger & Hawkins, 2006).

Researchers have begun to investigate the relationship between course development and course quality. The Institute for Higher Education Policy identified seven categories of quality measures: institutional support, course development, teaching and learning, course structure, student support, faculty support, and evaluation and assessment. Under the course development category, an institution should establish minimum standards and continuous reviews to ensure quality (Merisotis & Phipps, 2000). A similar effort was made in Canada with the publication of the *Canadian Recommended E-learning Guidelines*. These guidelines defined quality outcomes with a strong emphasis on learner-centred curricula and customer-oriented services. They did not suggest a development model to achieve those outcomes but did imply the importance of routine review and evaluation of course content, design, teaching, student achievements, policies and management practices, and learner support (Barker, 2002). The Sloan Consortium's framework also proposes five pillars of quality: learning effectiveness, cost effectiveness, access, faculty satisfaction, and student satisfaction. Again, among a myriad of measures, the Sloan-C framework proposes a collaborative approach to curriculum design. It states that "effective design involves resources inside and outside of the institution, engaging the perspectives of many constituents... [and] aiming to use the experience of learners, teachers, and designers" (Moore, 2002, p. 17).

Many higher-education institutions now have instructional designers at the centre of curriculum design and development activities. Instructional design as a discipline came from skill-based training in the military during World War II (Reiser, 2001). Generally, instructional design practice did not have a significant presence on university campuses until the late 1980s and early 1990s when Internet technology and the resulting advances in online learning models and practices became prevalent. This enhanced presence did not necessarily equate with success. The common practice of systematic design, such as the ADDIE model, simply did not fit well with the academic culture (Moore & Kearsley, 2004; Magnussen, 2005). Over the past two decades, instructional designers in higher education have needed to redefine their role and practice. The role of a change agent emerged as instructional designers worked side by side with faculty to rethink their teaching in order to integrate technology into course design and delivery (Campbell, Schwier, & Kenny, 2007). Not only do instructional designers play the role of advisers to faculty and department on issues of curriculum and course quality, they also play a vital role in faculty development and institutional change when it comes to researching and implementing new learning technologies. Undoubtedly, instructional designers in higher education need to modify their approach and design models to fulfill their widening role and to make meaningful contributions. New design prototypes have evolved through field experience in higher education

(Power, 2009), and role-based design has been proposed to transform the field of instructional design (Hokanson, Miller, & Hooper, 2008).

In summary, the literature cited reveals several important trends in course development. First, quality standards are receiving more attention as online education moves into the mainstream. Increasingly, universities and colleges are using standards to define quality. Second, instructional design is undergoing a transformation with the designer's role changing to fit the shifting needs of higher education; designers are (and could be) viewed as change agents. Team-based collaborative course development is highly regarded in the field. However, collaborative course development with the use of quality standards is in need of close examination in terms of its effectiveness and applicability in the large-scale production required by online learning institutions, such as Royal Roads University. As Liston (1999) pointed out, building an effective quality culture requires, in part, prudent management of key processes.

This research investigates the course development process through the analysis of several case studies; as well, it explores the implications of collaboration on the enhancement of online course quality.

Research Questions

The study had three purposes: (1) determining how quality standards can be effectively used and implemented by faculty and instructional designers; (2) determining what kinds of collaborative processes involving faculty and instructional design staff best support the implementation of quality review processes; and (3) ascertaining how to make the development process as effective as possible by examining both the important elements of course quality and the key elements of collaboration.

Key questions in the research process are presented below:

(1) Elements of quality

- What are the important aspects of course quality? What criteria were valued highly by course developers?
- Were the quality guidelines helpful? Did they play a role in strengthening course quality? How?

(2) Elements of productive collaboration in course development

- What factors related to collaboration helped the development of a quality course?
- What factors related to collaboration hindered the development of a quality course?

(3) Optimal development process

- How can we improve the process and make best use of the resources to ensure that courses meet the quality standards?

Research Method

The research used a case study approach to examine how quality standards can be effectively implemented with a collaborative course development strategy. The case study is well established as a qualitative research method in the social sciences (Bromley, 1977). In each of the four cases selected for the study, an instructional designer worked with a faculty member to create and implement a collaborative process for using the quality standards to design and review an online course.

The four cases were selected, through purposive sampling, from different program areas to increase the breadth of the inquiry. This sampling process ensured that a diversity of courses, both new and those in revision, were examined. The faculty member's level of experience with online courses was also taken into consideration during the sampling process. The small sample size also allowed an in-depth look into the course development process and the working relationship a faculty member forged with an instructional designer. All courses were offered within three months of one another and were of the same duration with a similar amount of content.

The four cases are listed below:

- Course A is a new course in an existing undergraduate program. A set of new learning outcomes had to be constructed to fit with the program's overall outcomes. The faculty member has been teaching in the program since its inception. The faculty member and the instructional designer had worked well together prior to developing this course. This course required Curriculum Committee approval to proceed.[1]
- Course B is part of an existing undergraduate program. It required a major revision. The faculty member and the instructional designer had worked briefly together prior to developing this course. The faculty member was the original creator of the course and has taught it since the beginning. Because the course content was over three years old, the faculty member felt the time had come to overhaul it. While the revision adhered to the same learning outcomes, several content and learning activities were changed. This course required Curriculum Committee approval to proceed.
- Course C is a graduate-level course. It required minor revisions. The faculty member and the instructional designer knew each other well. The instructor designed the course and has taught it for many years. The revisions consisted of small changes to improve the learning activities.
- Course D is a graduate-level course. It required minor revisions. The course was developed by another faculty member, and the faculty member in our study was asked to teach it with minor tweaks. The faculty member and the instructional designer did not

[1] All new courses or programs and all "major revision" courses (a change to at least 40% of the content of the course) must be approved by the Curriculum Committee in order to be offered to Royal Roads learners. Two of the four cases in this research project required Curriculum Committee approval to proceed (Courses A & B). Therefore, an added dimension of the course development process for the instructor and instructional designer of those courses was to keep the requirements of Curriculum Committee approval in mind while developing the course.

know each other and were working on this course for the first time. Also, the faculty member was new to online teaching and the instructional designer was new to the university.

Both Yin (1984) and Stake (1995; 1998) argue that the use of multiple data-gathering strategies enhances the richness of the case analysis and increases the credibility of the reporting. Therefore, multiple data-gathering strategies in this study include document analysis, a survey, and semi-structured interviews. These three data-gathering strategies are described briefly below:

1. The quality standards were converted into a guidelines checklist, which enabled the tracking of the standards as they pertain to specific courses. Participants were asked to use the guidelines checklist to review the course as it was being developed and to note any comments that might be helpful to the research team.
2. A short survey was used to gather feedback from the faculty members and instructional designers regarding specific improvements to the quality standards after using them to design an online course. Once the course was launched, each team of faculty members and instructional designers was sent a copy of the "About the Guidelines" survey and asked to complete it. Questions for this survey are found in Appendix B.
3. Semi-structured group interviews were conducted with the faculty member and instructional designer who were working together to develop courses using the quality review criteria. The purpose of the interviews was to determine the strengths, limitations, and lessons learned in using the quality standards in a collaborative way. Questions for the interviews are found in Appendix C.

All interview transcripts and survey results were subjected to a thematic analysis of their content by the research team. Then these analyses were compared and re-examined until a common set of themes had been determined and agreed upon. These themes were used to code data from the transcripts using an inductive analytical approach as described by Huberman, Miles, and Lincoln (1994) and Mason (1996). As a form of interpretive research, the study placed emphasis on exploring the subjective and inter-subjective meanings that participants articulated as they reflected on their involvement in the course development process (Guba & Lincoln, 1994).

Research Findings

The research findings integrate the data gathered through the interviews and the open-ended survey responses.

Important Aspects of Course Quality

It was clear that each faculty member and instructional designer focused on different quality standards as they took notes during the development. Interviews frequently referenced discussions that took place about what constitutes a quality course. Both the faculty members and the instructional designers felt that certain standards demanded more attention than others. For example, criteria related to learning outcomes and assessments were viewed as quite important.

One faculty member said, "There are some guidelines that lend themselves well to the very early conceptualization of the course and the overall design."

However, an assessment of the value of specific guidelines varied among the development teams. Some teams thought criteria related to learning outcomes were important while others thought criteria related to student workload and learning styles were important as those details tended to be overlooked in the course development process.

Helpfulness of the Quality Guidelines

All participants indicated in the survey and in the interviews that the quality guidelines were helpful.

However, one instructional designer and one faculty member felt that using the guidelines at the start of the development process did not make much difference in the quality outcome of the course. All participants agreed that the guidelines were helpful at the end of the process as a checklist: "I used [the guidelines] when I first received them, starting the development, and then I used them again when I was finishing up [the last details]."

Some participants also stressed that the guidelines were only helpful if they could be adapted based on the needs of the course, of the instructional designer, and of the faculty member, and that they could not be used in isolation. One designer stated, "I would not recommend using [the guidelines] without a discussion of how they apply to each specific course."

A faculty member wrote, "Guidelines can't be separated from the conversations that occur with the instructional designer – they won't be effective on their own."

Even though the guidelines were used in different ways in the four cases, several participants commented that the guidelines provided an objective, outside perspective on what was important in the course development process and helped to expand their overall development toolkit.

On a university-wide level, the findings provided some interesting insights into how course development relates to other entities within the university. In particular, the participants indicated that the guidelines helped them to better prepare for the Curriculum Committee review process:

> …in my previous experience with [the] Curriculum Committee, instructors go into it by themselves, never quite sure what to include or leave out [in their curriculum submissions]. With [these guidelines], they'd get far more guidance and help to produce something valuable.

The guidelines also served to provide an institutional definition of course quality for faculty and for learners. The following comment illustrates such a viewpoint: "Sometimes instructors, I think,

don't realize what goes on behind the scenes, [that] what they are doing is part of a larger process…this reminded me of that."

The survey data and interviews suggested that the participants' views on the usefulness of quality guidelines depended on their level of experience. For a relatively new faculty member, the guidelines served as an orientation and helped to clarify how to create a successful course. The instructional designer who was relatively new to Royal Roads commented that the guidelines helped to establish consistency in the development process.

One experienced faculty member indicated that the guidelines complemented existing training and experience and were a positive reinforcement of faculty members' pre-existing competency. Faculty also characterized the guidelines as a "reminder," a "reference," and a "checklist." The guidelines were used as a validation step to gauge the robustness of the instructional design qualities of the course, which provided the faculty member with more confidence that he or she was "doing the right things" while helping to ensure that he or she "didn't miss anything." One faculty member said that it helped to "refresh my memory." In other words, the guidelines were seen as a positive and empowering tool in the course development process, highlighting how much the faculty member and the instructional designer already knew.

A couple of responses touched on the time pressures that faculty members face during the course development process, indicating that the guidelines were more helpful when not dealing with short timelines and acute time pressures, leading to speculation that the use of the specific standards would need to be prioritized or used selectively.

Factors that Facilitate Collaboration

Having rapport is a crucial factor in collaboration. This means that the instructional designer and the faculty member are familiar with each other's working styles. For the instructional designer, the rapport comes from her familiarity with the course content and the faculty member's teaching philosophy. One instructional designer said, "We've known each other for a long time so we [have] already established that rapport working together."

Another commented, "...it comes down to building relationships, having the time, having that strong foundation."

A faculty member further commented:

> … [the instructional designer] knew the program very well… it didn't take me too long to explain… with a certain understanding with content, because she knew exactly what the structure and the overall structure of the process and the overall rationale of the program. It helps a great deal.

It seems easier to take a collaborative approach to course design when the relationship between the instructional designer and faculty member has already been established. This relationship may be strengthened at the personal level when the pair has known each other for a long time and has a history of successful collaboration.

Without the history of working together, however, the faculty member and the instructional designer appear to become a productive team if they have enough time to establish expectations up front and if they allow themselves to move at a pace that gives them room to listen to feedback and to reflect. Collaboration was fostered by what an instructional designer called "early conversations." She commented, "The first conversation was really all-encompassing; I think it's not just the design, but it's the goal and how we approach this and the underlying teaching philosophy."

Another instructional designer described the exchange she had with an instructor during their first meeting for their first course project together:

> [the instructor] has some strong feelings [about] participation marks. So after hearing him talk about it, I could see his point and see his reasoning, and I think my biggest advice to you was to make it clear up front what you think and why you think that.

These conversations, whether face-to-face, by phone, or by email, created a sense of team solidarity because they helped create a shared understanding and vision. Also, having an upfront discussion about vision and goals for a course helped to set the stage for further discussions related to the elements of course quality. One instructional designer said,

> [there is] value in actually having that first conversation to get a better understanding of what your objectives are in terms of revisions, what you want to see out of the course, and how you want to improve the experience.

Using the guidelines facilitated a team approach to course revision. For the faculty members, this was a positive experience because it seemed as though there was shared responsibility among various people for enhancing the course (e.g., faculty members themselves, instructional designers, web developers, even the Curriculum Committee). But one faculty member did comment that he felt "vulnerable" having so many eyes looking in on his course, that he had to get used to this team approach, but that he came to appreciate it by the end. There is no doubt that a faculty member's willingness to be open to feedback is very important in the collaborative process as well as an instructional designer's investment in building rapport and in understanding an individual faculty member's teaching approach.

Factors that Hindered Collaboration

Several factors related to collaboration could hinder the development of a quality course. Participants seemed to agree that introducing all the guidelines at once could be overwhelming, especially when the development timeframe is short.

For example, in one case, the instructional designer used the guidelines as a template to provide feedback. The faculty member reported feeling overwhelmed by the amount of detailed comments beside many of the criteria and thought all comments needed to be addressed before the course went to the Curriculum Committee. Further discussion with the instructional designer revealed that this was not the case, leading the faculty member to feel that using the guidelines in this way confused matters.

It became apparent to faculty members and instructional designers that different criteria were important at different stages of the course development. Also, faculty members and instructional designers felt that they should have the freedom to adapt the guidelines to their level of experience and to the circumstances of the course development project. According to the study participants, early and clear communication about how the guidelines were going to be used was also important. One instructional designer said that the danger of unclear expectations and of overload of information risked damaging a positive working relationship.

Everyone seemed to view collaboration as a positive experience and a necessary step in producing quality courses. However, it is a double-edged sword, as one instructional designer indicated:

> The downside is it's labour intensive… But… we got a much better outcome, and that much better outcome saves us a lot of time down the road. Because we'll be better received by learners, it'll be a much better experience for them…So if you look at the whole picture, I think it's better.

Participants' responses indicated that collaboration is viewed as time consuming, but if the team can focus on shared meaning and vision early enough, as well as on a productive working relationship, it can reduce the amount of time and work spent fixing problems later, the kind that, if they arise, can compromise the quality of a course.

Overall, the participants felt that it wasn't necessary to introduce the guidelines in a formal and artificial way when their collaborative work "naturally flowed." They used parts of the guidelines when they needed to and in a way that suited their workflow.

Optimal Development Process

In addition to the faculty member's level of experience, the nature of the course development project affected the way the instructional designer and faculty member worked together. In the

cases of a new course or major revision, collaboration played an important role, requiring relationship building and visioning to create synergy in the team. If the course required a minor revision, the nature of the collaboration became task-oriented, rather than based on building a vision and relationship. One instructional designer commented on the importance of collaboration when developing a new course:

> …it's more effective and it really helps the course quality if the guideline is used in conjunction with a very collaborative approach. And that's why I find it takes that initial discussion, the overarching discussion we have about teaching design because [the guidelines document] is an additional tool, on top of a very strong collaboration approach, just brings so much more value and will no doubt produce much better course quality.

In contrast, the instructional designer who worked on a minor revision said:

> I don't know that we did a lot of collaboration. I mean, we did updates based on past experience of the course. I reviewed the course…We're not finished as well because we'll look to the web developer coming in and looking over images. I think there's going to be more opportunities to look at the course again….What [the faculty member] intends with the images …we didn't have those conversations about the course.

There is no doubt that faculty members and instructional designers have different levels of experience and different working styles. Each course project has unique characteristics. All of these factors influence the collaborative process.

Furthermore, there was strong agreement among the participants that the quality standards need to be used flexibly in different course development situations to accommodate unique course development needs, individual teaching styles, and differing program contexts. As well, participants referred to the need for an "evolving" use of the standards during the course development process, which would allow them to make the different standards as meaningful as possible when they were most relevant in the course development process.

Conclusion

From the interview and survey results reported, it is evident that the instructional design quality guidelines were valued by faculty members and instructional designers as being informative in the course development process. The degree of helpfulness of the guidelines, however, appears to be influenced by the experience level of the faculty member involved. There was strong agreement among participants that the guidelines are more helpful for new and less-experienced faculty members. In all four cases, however, the participants indicated that they valued the guidelines as part of the overall review process before the course was launched. As a whole,

participants placed the most value on the guidelines related to outcomes and assessment, although this perspective varied among the four development teams.

The four cases revealed different patterns of collaboration between the faculty member and the instructional designer. Establishing rapport early in the course development process was important and was made easier when a strong relationship had been established between the faculty member and instructional designer. Having sufficient time, or creating opportunities to dedicate time, for the mutual and respectful exchange of expectations/reflections about the course early in the development process was important in developing a shared understanding of what revisions were required and how the development process was to proceed.

All participants viewed the collaboration between the faculty member and the instructional designer to be a positive experience. Nevertheless, participants were able to cite factors related to the collaboration that hindered or potentially hindered producing a course that met the quality standards. Addressing all of the quality standards at the same time appeared to be overwhelming to faculty members and, therefore, limited the usefulness of the guidelines as both a course development tool and as a checklist on course quality. The responses of participants indicated that, based on their collective experience, the standards should be viewed as a set of guidelines that are flexibly and systematically introduced, along with a discussion of how to make the best use of them throughout the course development process. How the guidelines are used should depend on the nature of the course, the working relationship between the instructor and instructional designers, and the experience level of the instructor.

The study has a limitation, however. This research examined the relationship between faculty members and instructional designers in the four case studies but did not take into account the perspectives of other personnel who might have played important roles in the course development process, such as the program head and web developer.

Despite this limitation, a distinction between two types of specific uses of the quality guidelines has clearly emerged. Understanding these uses among the four cases sheds light on the degree and nature of the collaborative relationship that is most helpful in improving the course development process. Figure 1 illustrates the type of course development in relation to the implementation of the standards (i.e., guidelines used as a checklist vs. guidelines used as a development tool) and the nature of the collaborative relationship between the faculty member and the instructional designer (task-oriented vs. synergistic relationship).

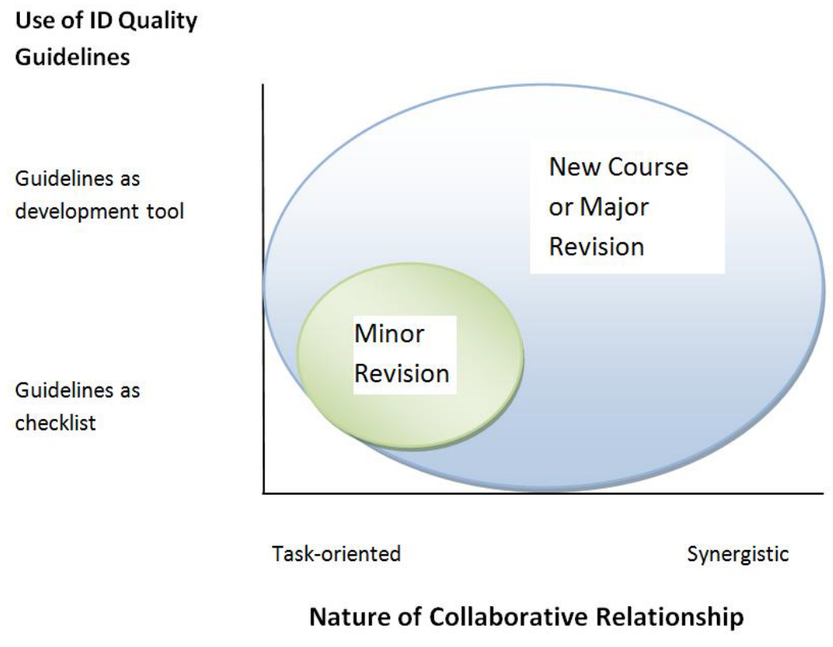

Figure 1. Different types of course development projects in relation to the use of quality guidelines and the nature of collaborative relationship.

In cases B, C, and D, where the courses had been designed and taught before, the team used the guidelines as a checklist. The faculty member and the instructional designer took a task-oriented approach. There was not as much time invested in discussing high-level design questions, nor was there much time dedicated to developing the relationship between the two team members. In addition, when an instructional designer and a faculty member already have a strong rapport, the revision is quite efficient as the team shares an understanding of the course's pedagogy and each other's working styles. On the other hand, in new courses or courses requiring extensive revisions, such as Course A in the study, faculty members and instructional designers were willing to invest time and effort in relationship-building activities that helped the team members develop a common vision for the course. Thus, the instructional design standards were a development tool used to set expectations, guide teamwork, and create opportunities for dialogue about the expectations for the course.

Taking all the findings together, there seems to be a need to better define the scope of course development required in individual courses and the level of collaboration necessary to produce a high-quality course. It is clear that the need for an elaborate collaboration process is the greatest when a new course is being developed. Therefore, new courses may benefit from a highly collaborative process, more so than courses requiring less extensive development or re-development. The cases suggest that a collaborative development process that integrates the use

of quality standards throughout the process would produce quality courses, primarily when the development work is complex and extensive. Such an approach has an added value of maintaining consistent quality at the institutional level, orienting new faculty members and instructional designers, and rejuvenating course development teams as the guidelines remind them of what is important in a quality course.

The cases also revealed a distinction between the extent of collaboration required to effectively support new course development and the extent required to support revision-based course development. Thus, it would be useful to seek a better way of judging a course development project from the onset so that different and more efficient processes could be implemented while ensuring that the quality standards are met.

Finding an optimal development process and a clear distinction between new course development and revision-based development has implications for an efficient, large-scale course development operation at an educational institution with extensive online course offerings, such as Royal Roads University. In the Sloan Consortium's quality framework, cost-effectiveness is a pillar equal to all other measures (Sloan Consortium, 2004). It implies that quality is a value determined by the ratio of benefits and cost. In other words, are the resources devoted to the elaborate collaboration justified in terms of producing the highest quality? Do all courses, regardless of the development scope, require a highly collaborative process? These remain crucial yet unanswered questions, even though the consensus in the field is to use collaborative approaches and to utilize the skills of instructional designers, web developers, graphic designers, and other IT personnel on a development team (Caplan, 2008; Knowles & Kalata, 2007).

Finally, our findings and conclusions from the four cases warrant the following recommendations, which course development teams may wish to consider in using quality standards effectively:

1. Ensure that the specific use of the guidelines is matched to the particular needs of the course development/revision process, i.e., for new courses, the guidelines can be used to facilitate the development process from the ground up to enhance quality; for revisions, they may serve as a checklist to maintain course quality.
2. Systematically plan for the additional effort and time involved in new course development and major course revisions in order to use the guidelines in a collaborative manner.
3. Use guidelines flexibly as a "guide," not as a template. Their use should depend on (a) the specific nature of the course development or revision process, (b) the level of experience of members of the course development team, and (c) the nature of the pre-existing relationship between members of this team.
4. Use guidelines to assist in developing shared understandings and expectations for the design of the course.
5. Use guidelines to help the development team focus on priorities for the development/revision process.

6. Raise awareness university-wide that guidelines are available for course development teams to use in a flexible way to support and enhance course quality.

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Appendix A

Royal Roads University Course Quality Standards

Standards	Comment
1. Course learning outcomes/competencies are aligned with and assessed against the program's outcomes/competencies.	
2. (Authentic / active) learning activities and assignments are aligned with the stated learning outcomes.	
3. Selected readings and resources reflect and fit the subject and course learning outcomes.	
4. Activities Schedule (or Calendar) identifies all course activities and due dates to guide learning.	
5. The number of readings, activities, and assignments is appropriate for effective learning (i.e., avoid information overload).	
6. Instruction (text) is written clearly and presented properly for effective learning. Design elements include: a. meaningful chunking b. meaningful placement c. easy and logical navigation d. on-screen reading vs. printing e. consistent use of headings	
7. Multiple learning styles are accommodated in the design and delivery of the course.	
8. Use visuals, multimedia, or other learning tools such as glossary, quiz, poll, etc. to engage learners.	
9. Instructional strategies for building community are used; for example, peer interaction and collaboration is planned and facilitated.	
10. Expectation regarding instructor presence and learner participation is clearly communicated.	

Appendix B

Survey Questions

Please use the rating of 1 to 5 for the following statements, 1 being **Strongly Disagree**, 2 being **Disagree**, 3 being **Neutral**, 4 being **Agree,** and 5 being **Strongly Agree**.

1. The quality guidelines are comprehensive.	1	2	3	4	5
2. Having the quality guidelines at the start of the course development process made a difference in the outcome of the design.	1	2	3	4	5
3. The interim assessment using the quality guidelines is helpful.	1	2	3	4	5
4. The final assessment using the quality guidelines is helpful.	1	2	3	4	5
5. Using the quality guidelines during the course development improves course quality.	1	2	3	4	5

6. Please add your comments or suggestions to the use of the quality guidelines and the collaborative development process (i.e., working with an instructional designer, web developer, and the quality check staff).

7. Do you think you will use the guidelines for future course developments? Why or why not?

Appendix C

Interview Questions

1. We had a look at your course and have a general idea about the content. Imagine we are the learners new to this course; could you please briefly describe your course and your approach to teaching?

2. Could you describe how you (referring to the instructor and the instructional designer) use the guidelines, for example, at which point during the revision did you use the guidelines, and did you discuss them to make decisions on revisions?

3. How would you describe your experience with the guidelines and new process, compared with your past experience designing courses at RRU?

4. What part of the guidelines did you find most useful when designing and developing/updating a course?

5. What part of the guidelines did you find least useful when designing and developing/updating a course?

6. Do you think using the guidelines helped improve course quality? Please explain how (or why not).

7. Do you feel you collaborated during the development of the course? Please explain and give examples of the collaborative tasks you have done.

8. Did you think the development process should have been more collaborative or less collaborative? Why?

9. From your experience in this project, what helped you to use the guidelines? What were the barriers in using the guidelines?

10. How would you recommend the guidelines be used if this project is expanded to all your colleagues? What are the potential barriers if we expand this project to all courses?

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Athabasca University

A Review of Paradigms for Evaluating the Quality of Online Education Programs

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Abstract

As the demands for public accountability increase for higher education, institutions must demonstrate quality within programs and processes, including those provided through online education. While quality may be elusive to specifically quantify, there have been several recommendations for identifying and defining quality online education that address common areas of program development and administration. This paper explores and compares 13 recommendations and paradigms found in the literature for identifying and evaluating the quality of online education programs in higher education.

Introduction

In the early years of higher education, quality education was defined as a small group of elite students living together and learning under the guidance of a resident scholar. Later, quality was believed to primarily exist in those institutions that were expensive and highly exclusive (Daniel, Kanwar, & Uvalic-Trumbic, 2009). However, that is no longer the case; today, public scrutiny for higher education is greater than ever before (Wergin, 2005) with the number of stakeholders and constituencies—all who have a vested interest in quality and accountability—continuing to increase. Because of this interest in quality, many institutions are finding that their standard processes for quality assurance are now inadequate and, often, not a continuous process for improvement (Dill, 2000).

Quality assurance and accountability for higher education institutions in the United States have been addressed primarily by the regional accreditors and discipline-specific accreditation organizations such as the Association to Advance Collegiate Schools of Business (AACSB) for business programs, the National Council for Accreditation of Teacher Education (NCATE) for education programs and teacher certification, and various others. Regional accreditors emphasize the review process with an institution's self-study report, which demonstrates that established standards (e.g., faculty credentials, financial performance, student satisfaction, and the achievement of learner outcomes) have been met. The regional accrediting bodies also have guidelines and standards for evaluation for distance education programs (Howell, Baker, Zuehl, & Johansen, 2007).

With the establishment of the Spellings Commission in 2005, the federal government became more heavily involved in institutional accountability. Institutions are being asked to provide more transparent evidence of student achievement and institutional performance, to establish methods for comparing to and benchmarking against other institutions, and to establish threshold levels for learning standards (Eaton, 2007). As if administrators needed more motivation, Rice and Taylor (2003) assert that "shrinking budgets, achievement-based funding, and demands for assessment of student learning" (p. 2) alone should encourage the implementation of quality-based management strategies for continuous improvement. Because of the changing landscape and increased call for accountability, higher education is now being challenged to reconceptualize methods and processes used to indicate quality and excellence, including those used for assessing and evaluating online education programs.

Quality Evaluation for Online Education Programs

It has been said that delivering higher education courses online "holds greater promise and is subject to more suspicion than any other instructional mode in the 21st century" (Casey, 2008, p. 45). However, it

has been said that “quality is a complex and difficult concept, one that depends on a range of factors arising from the student, the curriculum, the instructional design, technology used, [and] faculty characteristics” (Meyer, 2002, p. 101). While the total concept of quality for all program elements may be difficult to grasp, it is not an excuse to ignore the need for assessing and demonstrating quality online education. Moreover, as the growth continues as expected, the demand for quality will only increase (Cavanaugh, 2002). According to the literature, many different approaches exist to evaluate quality in online education. For example, Lee and Dziuban (2002) suggested that the overall success of online education greatly depends upon the quality evaluation strategies integrated with the program. Benson (2003) explored the different meanings of quality that stakeholders brought to the table when planning an online degree program. She found the following perceptions of quality were resonant with stakeholders: quality is overcoming the stigma associated with online learning; quality is accreditation; quality is an efficient and effective course development process; and quality is effective pedagogy. After paralleling the demise of some online education programs created as stand-alone units to the dotcom bust in 2000, Shelton and Saltsman (2004) postulated that the mark of quality for an online education program is not its growth rate but the combination of retention rate, academic outcomes, and success in online student and faculty support. However, after their study of program administrators, Husman and Miller (2001) argued that “administrators perceive quality to be based almost exclusively in the performance of faculty” (para. 17). Online education has been heavily critiqued and compared to traditional teaching since its emergence as an instructional technique, with veiled suggestions of inadequacies and low quality. Responding to those suggestions, various approaches found in the literature propose guidelines for evaluating quality online education programs.

Methodology

For this paper, 13 paradigms for evaluating quality in online education programs were located within the literature, and carefully examined and compared for similarities and differences. Each study or article reviewed listed certain areas of focus and themes considered basic for indicating quality in online education programs. Using an Excel spreadsheet and coding method, each paradigm was broken into the primary areas of focus or themes. The studies examined are not exhaustive but best represent the different efforts available to define and evaluate the quality of online education programs. The articles and studies examined are presented in chronological order of their appearance in the literature.

Existing Paradigms for Evaluating the Quality of Online Education Programs

The following studies and articles were examined:

- IHEP’s 24 Benchmarks for Success in Internet-Based Distance Education (2000)
- Bate’s ACTIONS Model of Quality (2000)
- WCET’s Best Practices for Electronically Offered Degree and Certificate Programs (2001)
- Khan’s Eight Dimensions of e-Learning Framework (2001)
- Frydenberg’s Quality Standards in e-Learning (2002)
- Sloan Consortium’s Five Pillars of Quality (2002)
- Lee and Dziuban’s Quality Assurance Strategy (2002)
- Lockhart and Lacy’s Assessment Model (2002)
- CHEA’s Accreditation and Quality Assurance Study (2002)
- Osika’s Concentric Model (2004)
- Moore and Kearsley’s Assessment Recommendations (2005)
- Haroff and Valentine’s Six–Factor Solution (2006)
- Chaney, Eddy, Droman, Glessner, Green, and Lara-Alecio’s Quality Indicators (2009)

IHEP’s 24 benchmarks for success in Internet-based distance education. Commissioned by the National Educators Association and Blackboard, Inc., the Institute for Higher Education Policy (IHEP) in their report, *Quality on the Line: Benchmarks for Success in Internet-Based Distance Education* (2000), identified 24 individual quality indicators chosen as absolutely essential by various respected online education leaders of higher education institutions out of an original 45 indicators determined through a literature search. While the study called each indicator a benchmark, they are, in reality, attributes of an online education program to indicate overall quality; they are not measureable against other institutional results. The study sought to prove that “distance learning can be quality learning” (Institute for Higher Education Policy, 2000, p. vii).

Considered foundational to quality distance learning, the Institute for Higher Education Policy’s (IHEP) research (Chaney et al.,2009) categorized the 24 quality indicators into seven themes: (1) institutional support, (2) course development, (3) teaching and learning, (4) course structure, (5) student support, (6) faculty support, and (7) evaluation and assessment. For example, under the Institutional Support (1) theme, the first indicator prescribed “a documented technology plan [in place] that includes electronic security measures to ensure both quality standards and the integrity and validity of information” (Institute for Higher Education Policy, 2000, p. 2). The Institutional Support (1) theme included reliability of the technology infrastructure and assurance that support is maintained for continued growth.

The Course Development (2) theme determined if guidelines are in place for the development of quality online course materials. Online course materials should engage the learner, encourage critical thinking, and undergo periodic revision. The Teaching/Learning (3) theme stipulated that interaction must occur during the teaching and learning process (student-instructor, student-student), and timely and constructive feedback is provided.

The Course Structure (4) theme addressed the quality of information, such as a student readiness indicator and course objectives, provided to a student prior to enrollment in an online class. Included in this theme was a provision of library resources for online students, which was also a requirement by all regional accrediting bodies. The Student Support (5) theme considered the kind of information students receive about the program, admission requirements, proctoring requirements, and if all student services were available to online students. Online programs should have a repository of materials, such as a list of frequently asked questions and information on where to get help, online students will need to be successful in the program.

The Faculty Support (6) theme included the resources provided to faculty for developing and teaching an online course. Faculty also need polices and a support structure, as well as training and mentoring. The final theme, Evaluation and Assessment (7), was concerned with if, or how, online education was being evaluated and what policies and procedures were in place for supporting an evaluation process. According to IHEP (Institute for Higher Education Policy, 2000), “data on enrollment, costs, and successful/innovative uses of technology are used to evaluate program effectiveness” (p. 3). Learning outcomes should be assessed and evaluated for clarity and appropriateness to support continued improvement.

Bates’ ACTIONS model of quality. To evaluate instructional technologies in education, Tony Bates (2000) coined the acronym *ACTIONS*: **A**ccess and flexibility, **C**osts, **T**eaching and learning, **I**nteractivity and user friendliness, **O**rganizational issues, **N**ovelty, and **S**peed. The ACTIONS model was designed to help with the selection of instructional technologies and not to evaluate distance learning programs; however, each of these themes can be applied to online education. Bates’ ACTIONS model was one of the first to address cost factors, which affect both the institution and the student.

WCET’s best practices for electronically offered degree and certificate programs. One of the first attempts to identify and assess quality in online education was developed in 1995 by the Western Cooperative for Educational Telecommunications (WCET). *Principles of Good Practice for Electronically Offered Academic Degree and Certificate Programs* identified three primary categories for quality evaluation: curriculum and instruction, institutional context and commitment, and evaluation and assessment. Institutional context and commitment was further divided into five areas: role and mission, faculty support, resources for learning, students and student services, and commitment to support (Western Cooperative for Educational Telecommunications, 1997). A second report, developed in 2001 along with the regional accrediting bodies titled *Best Practices for Electronically Offered Degree and Certificate Programs,* expanded the prior report into five categories instead of three: institutional context and commitment, curriculum and instruction, faculty support, student support, and evaluation and assessment (Western Cooperative for Educational Telecommunications, 2001). In the prior report, faculty support and student support were considered subsets of the institutional context and commitment category. The 2001 report is one of the most frequently cited when quality indicators for online education programs are addressed.

The WCET standards developed in 2001 were not created as an evaluation instrument; rather, the standards demonstrated how basic principles of institutional quality already in place with the accreditors would apply to distance learning programs (Western Cooperative for Educational Telecommunications, 2001). These key elements of quality distance learning are still highly respected and have been used since their creation by regional accreditors to review programs for institutional accreditation.

Khan's eight dimensions of e-learning framework. Badrul Khan (2001) examined the critical dimensions necessary for quality learning online and found eight primary categories: institutional, management, technological, pedagogical, ethical, interface design, resource support, and evaluation (Khan, 2001). Each dimension, presented in Table 1, is integral to a systems approach for evaluating quality.

Table 1

Khan's Eight Dimensions of E-Learning Framework (2001)

Dimensions of E-Learning	Descriptions
Institutional	The institutional dimension is concerned with issues of *administrative affairs*, *academic affairs,* and *student services* related to e-learning.
Management	The management of e-learning refers to the *maintenance of learning environment* and *distribution of information.*
Technological	The technological dimension of the E-Learning Framework examines issues of technology infrastructure in e-learning environments. This includes *infrastructure planning, hardware,* and *software.*
Pedagogical	The pedagogical dimension of E-learning refers to teaching and learning. This dimension addresses issues concerning *content analysis, audience analysis, goal analysis, media analysis, design approach, organization, and methods and strategies* of e-learning environments.
Ethical	The ethical considerations of e-learning relate to *social and political influence, cultural diversity, bias, geographical diversity, learner diversity, information accessibility, etiquette,* and *the legal issues.*
Interface Design	The interface design refers to the overall look and feel of e-learning programs. Interface design dimension encompasses *page and site design, content design, navigation,* and *usability testing.*
Resource Support	The resource support dimension of the E-Learning Framework examines the *online support* and *resources* required to foster meaningful learning environments.
Evaluation	The evaluation for e-learning includes both *assessment of learners and evaluation of the instruction* and *learning environment.*

According to Khan, this comprehensive model may also be used for strategic planning and program improvement and has been widely adopted. Each dimension or category of quality indicators contained sub-dimensions (as shown in Table 3) that also may be used as quality indicators for program evaluation.

Table 2

E-Learning Framework Sub-Dimensions (Khan, 2001)

Sub-Dimensions	
INSTITUTIONAL • Administrative Affairs • Academic affairs • Student services	ETHICAL • Social and Political Influence • Cultural Diversity • Bias • Geographical diversity • Learner diversity • Digital Divide • Etiquette • Legal issues
MANAGEMENT • E−Learning Content Development • E-Learning Maintenance	INTERFACE DESIGN • Page and site design • Content design • Navigation • Accessibility • Usability testing
TECHNOLOGICAL • Infrastructure planning • Hardware • Software	RESOURCE SUPPORT • Online support • Resources
PEDAGOGICAL • Content Analysis • Audience Analysis • Goal Analysis • Medium Analysis • Design approach • Organization • Methods and Strategies	EVALUATION • Assessment of learner • Evaluation of the instruction/learning environment

Frydenberg's quality standards in e-learning. Frydenberg (2002) summarized published quality standards for online education in the United States and found the following most common themes in the literature: institutional and executive commitment; technological infrastructure; student services; instructional design and course development; instruction and instructors; program delivery; financial health; legal and regulatory compliance; and program evaluation. She observed the institutional and executive commitment theme to be one of the most common in the literature, and evaluation of a program to be the least written about, "since few fully developed programs have arrived at a stage where summative evaluation is possible" (p. 13).

Sloan consortium's five pillars of quality. The Sloan Consortium, an organization dedicated to improving the quality of online education, identified the Five Pillars of Quality Online Education (Bourne & Moore, 2002) they considered the building blocks for quality online learning: Learning Effectiveness; Student Satisfaction; Faculty Satisfaction; Scale; and Access.

The Learning Effectiveness Pillar addressed the commitment to providing students with high quality education at least equivalent to that of traditional students and which includes interactivity, pedagogy, instructional design, and learning outcomes (Sloan Consortium, 2009b). According to Lorenzo and Moore (2002), the Learning Effectiveness Pillar evaluates learning activities because they believed success is related to student interactivity with the instructor and creating a learning environment of inquiry. The Student Satisfaction Pillar focused on the experience of the student by providing necessary support services such as advising and counseling and opportunities for peer interaction (Sloan Consortium, 2009b). It also examined if students were satisfied with what and how they learned in either the class or overall program. In fact, "a number of studies show that online environments that effectively facilitate high levels of interaction and collaboration among learners typically result in successful online programs" (Lorenzo & Moore, 2002, p. 5).

The Faculty Satisfaction Pillar addressed the support and resources needed for faculty to have a positive experience in the online teaching environment. According to the Sloan Consortium (Sloan Consortium, 2009b), "Faculty satisfaction is enhanced when the institution supports faculty members with a robust and well-maintained technical infrastructure, training in online instructional skills, and ongoing technical and administrative assistance" (para. 5).

The Scale Pillar was originally entitled Cost Effectiveness and was later changed to "Scale"; a focus on

the cost effective programs is considered central to institutions who desire to "offer their best educational value to learners and to achieve capacity enrollment" (Sloan Consortium, 2009a). They believed an institution should monitor costs to keep tuition as low as possible while providing a quality educational experience for both students and faculty. Strategies for quality improvement were also addressed in the Scale Pillar.

The Access Pillar assured that students have full access to the learning materials and services they need throughout their online degree program, including support for disabilities and online readiness assessment. This pillar examined barriers that may be in the way of online students having access to all resources necessary to achieve success.

Lee and Dziuban's quality assurance strategy. Lee and Dziuban (2002) believed there were five primary components for evaluating quality in online education: administrative leadership and support, ongoing program concerns, web course development, student concerns, and faculty support. Structured around the University of Central Florida's online programs, their Quality Assurance Strategy (QAS) maintained the importance of administrative support and leadership for resources, training, and evaluation. They recommended that online programs be extensively planned through discussion, evaluation, and analysis, which is crucial to the overall success of the program.

Lockhart and Lacy's assessment model. Lockhart and Lacy (2002) worked with faculty and administrators at several national conference meetings to develop a model that offered seven components needed to evaluate online education: institutional readiness/administration (budgets, priority and management); faculty services (support, outcome measurement, and training effectiveness); instructional design/course usability (technology must be user friendly and accessible); student readiness (assessment for student readiness and preparation); student services (effectiveness of provided services); learning outcomes (measurement of learning outcomes); and retention (comparing rates to face-to-face delivery and enrollment monitoring). Focusing on data collection and analysis, they suggested surveying areas of faculty support and training and student support. They also recommended that student grades and retention rates be examined as well as results of online learning outcomes, which have proven to be essential to evaluation. Finally, they challenged higher education to understand "the critical element is that institutions should plan, evaluate, and then revise programs based upon assessment results rather than just being another institution to deliver classes at a distance" (p. 104).

CHEA's accreditation and quality assurance study. The Council for Higher Education Accreditation (CHEA) (2002) examined the 17 institutional accreditors recognized by the United States Department of Education (USDE) or the Council for Higher Education Accreditation (CHEA) because each reviewed distance learning programs within their constituency. Their work resulted in what they believed to be the seven most significant areas for assuring the quality of distance learning programs:

1. Institutional Mission: Does offering distance learning make sense in this institution?
2. Institutional Organizational Structure: Is the institution suitably structured to offer quality distance learning?
3. Institutional Resources: Does the institution sustain adequate financing to offer quality distance learning?
4. Curriculum and Instruction: Does the institution have appropriate curricula and design of instruction to offer quality distance learning?
5. Faculty Support: Are faculty competently engaged in offering distance learning and do they have adequate resources, facilities, and equipment?
6. Student Support: Do students have needed counseling, advising, equipment, facilities, and instructional materials to pursue distance learning?
7. Student Learning Outcomes: Does the institution routinely evaluate the quality of distance learning based on evidence of student achievement?
(p. 7)

The CHEA report (2002) described three challenges that must be addressed for assuring the quality of online education programs: the alternative design of instruction, the abundance of alternative providers of higher education, and an expanded focus on training.

Osika's concentric model. Osika (2004) developed a concentric model for supporting online education programs using seven themes: faculty support, student support, content support, course management system support, technology support, program support, and community support. She validated this model with a panel of experts that consisted of administrators and those with various roles in online education programs including faculty and staff members.

Moore and Kearsley's assessment recommendations. Moore and Kearsley (2005) postulated that while everyone within the institution has a role to play in quality education, they believed senior administrators should be responsible for measurement and quality improvements. While they did not offer a prescriptive plan for evaluation, they suggested assessment of the following areas: the number and quality of applications and enrollments; student achievement; student satisfaction; faculty satisfaction; program or institutional reputation; and the quality of course materials.

Haroff and Valentine's six–factor solution. Haroff and Valentine (2006) explored web-based adult education programs and found six dimensions in program quality: quality of instruction, quality of administrative recognition, quality of advisement, quality of technical support, quality of advance information, and quality of course evaluation. Beginning with the IHEP (2000) 24 quality indicators as a foundation, they surveyed administrators and educators involved in teaching online, using 41 quality variables. The six dimensions identified resulted from 65% of the variance in responses.

Chaney, Eddy, Droman, Glessner, Green, and Lara-Alecio's quality indicators. In a recent review of the literature, Chaney et al. (2009) identified the following as common themes of quality indicators: teaching and learning effectiveness; student support; technology; course development/instructional design; faculty support; evaluation and assessment; and organizational/institutional impact. (Table 3 provides the individual quality indicators listed for each theme.) They recommended that "the next step for professionals in the field of distance education is to integrate these quality assurance factors into the design, implementation, and evaluation of current and future distance education efforts" (p. 60).

Table 3

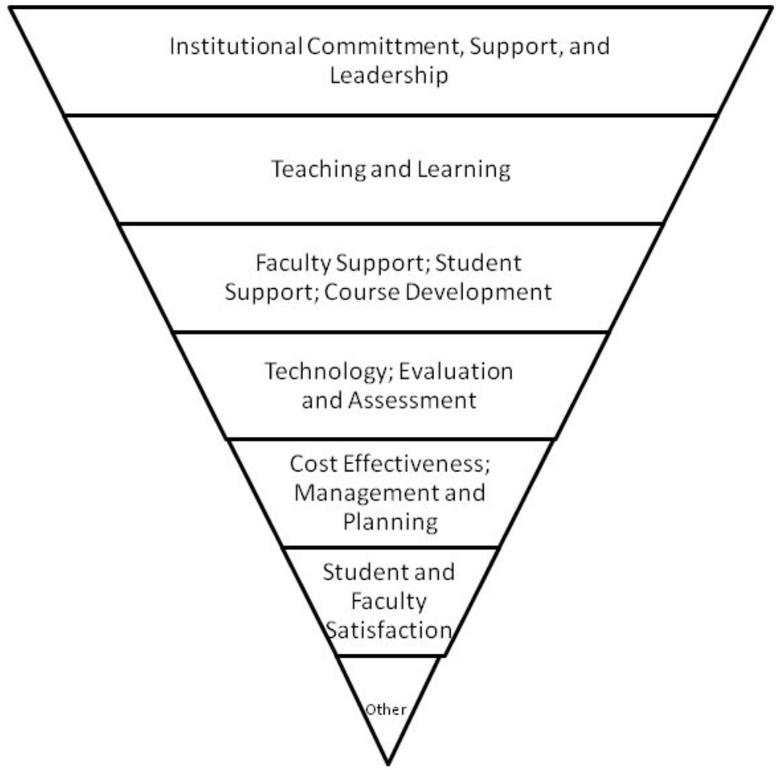
Common Quality Indicators of Distance Education Identified in the Literature (Chaney et al., 2009)

Theme	Indicator
Teaching and Learning Effectiveness	student-teacher interaction prompt feedback respect diverse ways of learning
Student Support	student support services clear analysis of audience
Technology	technology plan to ensure quality is documented appropriate tools and media reliability of technology
Course Development/ Instructional Design	course structure guidelines active learning techniques implementation of guidelines for course development/review of instructional materials
Faculty Support	faculty support services
Evaluation and Assessment	program evaluation and assessment
Organizational/Institutional-Impact	institutional support and institutional resources strong rationale for distance education/correlates to institutional mission

Theme and Paradigm Comparison. The 13 different articles and studies presented in this review of quality evaluation for online education programs have many commonalities among their findings. The Institutional Commitment, Support, and Leadership theme was the most cited when determining standards for online education programs. At least 10 of the paradigms examined pointed toward the Institutional Commitment, Support, and Leadership theme as being a primary indicator of quality. Teaching and Learning was the second most cited theme for indicating quality. However, the literature as a whole has

focused on the quality of teaching and pedagogy far more than that of program quality. Early in the literature, most authors wrote about overall design of the course since individual courses moved online before complete programs.

Faculty Support, Student Support, and the Course Development themes were the third most cited in the analyzed studies, with these being identified by eight of those examined. For success in teaching online, faculty require strong and ongoing support, training, motivation, compensation, and policy. Institutional support should also be available for online course development and for keeping materials updated and current. Online students require the same support services as traditional students; however, it is often more challenging to find ways to deliver those services and support in an online environment.



Technology and Evaluation and Assessment were identified in only 6 of the 13 studies reviewed. This is interesting to note since technology is foundational to the infrastructure of online education and should be considered a critical component to quality and success. Cost Effectiveness and Management and Planning were only identified three times in the studies; and Faculty Satisfaction, Student Satisfaction, and Student Retention were only listed twice out of the 13 examined. Various indicators, such as advising, government and regulatory guidelines, and user friendliness, were suggested just once.

Conclusions and Recommendations

This review of the existing paradigms suggests a strong need for a common method for assessing the quality of online education programs. Specific indicators for quality online programs vary from institution to institution; however, this review sought to find the most common themes and domains identified today by program administrators that will assist them with evaluating and improving the overall quality of their online education programs. While some of the themes were strongly considered to be significant quality indicators, others, such as faculty support, were not. A more consistent approach is needed.

Until recently, a researched-based rubric or scorecard designed to assess quality in online education programs, similar to such a tool for online courses, could not be located. However, as a result of a recent research study conducted by the author, a tool is now available that defines 70 elements of quality that may be quantified to assess an online program. This interactive tool, which produces a numeric score sheet that quantifies quality, should become an important resource for program administrators to identify and evaluate elements of quality within an online education program. The scorecard results may also point to recommended strategies of program improvement. *A Quality Scorecard for the Administration of Online Education Programs* may be accessed at the following website: http://sloanconsortium.org/quality_scoreboard_online_program. It is desire of the author that the Quality Scorecard will facilitate a more consistent method by which administrators and educators may evaluate and improve the overall quality of their institutions' online education programs.

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Student and Faculty Perceptions of the Quality of Online Learning Experiences

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Abstract

Some faculty members are reluctant to offer online courses because of significant concerns relative to the impact of such formats on the quality of instruction, learning, and participant interaction. Faculty members from The University of Southern Mississippi implemented synchronous interactive online instruction (SIOI) in the spring of 2007. This article explores the rationale for use of the particular technology, faculty conclusions regarding implementation of the technology, and the impact of the technology on instruction and learning. Comparisons by students of the quality of the learning experience in this environment with the quality of learning in face-to-face and asynchronous online learning environments were also analyzed.

The study finds that instructors and students view SIOI favourably. The mean student ratings for the dimensions of instructional quality were the same for SIOI and face-to-face course formats in all but one dimension, but mean ratings for SIOI and face-to-face formats were consistently higher than those for asynchronous online instruction. The single exception was for the dimension, ease of access to the course; the SIOI and asynchronous online formats were rated higher than the face-to-face format in this quality dimension. These findings suggest that it is possible to achieve levels of effectiveness in an online instructional format similar to those that are realized in face-to-face delivery. However, there is slight, though not statistically significant, evidence of concern about the quality of student collaboration in SIOI-enabled courses. Thus, instructors will need to capitalize on available mechanisms for interaction and collaboration.

Keywords: Internet in education; discussion in education; web-based instruction; online courses; instructional effectiveness in higher education

Most universities now offer some coursework online and some have converted programs of study in order to make them entirely available online. Approximately 4.6 million college students in the USA took at least one online course during the fall semester of 2008; this number doubled the 2.3 million students who took online courses in the fall of 2004 (Allen & Seaman, 2010; Allen & Seaman, 2006). In 2009, 73% of higher education institutions reported growth in demand for online courses and programs (Allen & Seaman, 2010). Most chief academic officers in universities (58%) perceive that online learning is critical to the long-term instructional strategies of their institutions.

In spite of the proliferation of online course-taking, many university faculty members are reluctant to teach courses via the Internet. In the fall of 2004, 26% of chief academic officers noted that "lack of acceptance of online instruction by faculty" is a significant barrier to the large-scale implementation of online courses" (Allen & Seaman, 2006, p. 13). As of fall 2009, only 31% of these university administrators agreed that faculty perceive online instruction as valuable and legitimate.

Interaction is a pivotal element of a powerful learning environment (Kester, Kirschner, & Corbalan, 2006). However, "educators do not yet know what forms of interaction people need, want, or expect to support their learning; and until we fully understand what it is about face-to-face interactions that enhance learning, we cannot know what features are required for an online system" (Wanstreet, 2006). It is this caveat that inspired the present study.

Purpose and Description of the Study

Examining and illuminating the perspectives of instructors and students who are involved in online courses can offer insights into the utility of various types of online instruction for graduate-level courses. The particular research focus on instructors and students using a synchronous technology with unique audio features provides insights into the medium's impact upon the concerns of instructors relative to course quality in online learning environments. Relatively little literature exists on instruction via synchronous online technologies that enable two-way audio interaction between instructor and students. The researchers describe this course delivery platform as *synchronous interactive online instruction* (SIOI). Using a mixed-methodology approach, the authors examined an online course medium used in graduate-level courses in educational leadership from two vantage points: 1) instructor perceptions regarding the quality of courses delivered via online instruction, and 2) student perceptions regarding the quality of courses delivered via online instruction.

Theoretical Framework and Related Review of Research Literature

While acknowledging that some instructors are reluctant to offer online courses because of entrenched approaches to instruction and/or ineptitude with instructional technologies, this study examines instructor reticence based on concerns over perceived inadequacies of online environments to attend to certain features of teaching and learning. Many instructors who are otherwise comfortable with technology in instruction cite concerns about online formats. They

express concern over reduced human interaction, technology malfunctions, variable technology proficiencies of students, and increased faculty workload (Beard & Harper, 2002). The authors chose to explore very specifically instances in which the resistance to online instruction was described by university professors – each of whom was comfortable and proficient with a number of computer and online applications – as a product of their concerns over the quality of teaching and learning in such venues. The researchers focused on three areas of theory that undergird conceptualizations of desirable learning environments: pedagogical orientation, social constructivism, and immediacy and interaction. The related review of research addresses primarily three types of learning environments: face-to-face instructor and student instruction; asynchronous online instruction; and synchronous instruction, including two-way audio enhanced online formats.

Pedagogical Orientation

The pedagogical orientations espoused by university instructors are pivotal as they consider the merits (or absence thereof) of online instruction. Core courses in professional schools are heavily oriented toward practitioner tasks (e.g., scenarios, simulations, practica, etc.). These are typically complex learning situations, integrating content across multiple disciplines. Such tasks promote deep learning and heighten prospects of successful transference of knowledge and skill to subsequent professional practice (Van Merriënboer, 1997). According to Newmann and Wehlage (1993), several conditions characterize authentic learning activities: analysis based upon depth of knowledge, dependence upon higher order thinking, substantive dialogue, social support for learners, and real-world applicability. Thoughtful presentation, demonstration, monitoring, and feedback positively impact student mastery of novel and complex material (Chen & Shaw, 2006).

Van Merriënboer and Kirschner (2001) distinguished between a world of knowledge and a world of learning. "In the world of knowledge, designers construct methods by which given learning goals in a specific subject matter domain can be attained by the learner. In the world of learning, …designers focus on methods enhancing deep level learning, intrinsic motivation, and collaborative argumentation" (p. 430). Kester, Kirschner, and Corbalan (2006) describe learning environments in which 1) complex learning occurs, 2) student motivation for learning is intrinsic, and 3) dialogue and debate are integral elements.

Various researchers have addressed the issue of quality in college-level teaching. Onwuegbuzie Witcher, Collins, Filer, Wiedmaier, and Moore (2007) found that college students believe teachers are effective when they are responsive, enthusiastic, student-centered, professional, and expert. Students further perceive their instructors to be effective when they provide multiple opportunities for student and professor interactions, impart critical information clearly and accurately, and organize the learning environment so that time is used well and the environment is orderly. Based upon some 50 years of research on college pedagogy, Chickering and Gamson (1987) developed seven dimensions of practice that have been widely accepted as criteria of quality in university instruction. An instructor is effective when he/she does the following:

- encourages student-faculty contact

- encourages cooperation among students
- encourages active learning
- provides prompt feedback to students
- emphasizes time on task
- communicates high expectations
- respects diverse talents and ways of learning

The degree to which such dimensions of instructional effectiveness are fulfilled is impacted not only by instructor behaviors and characteristics, but also by the techniques and media through which instruction is delivered. Many instructional techniques that work well for simple tasks do not work well for complex tasks. Learners who are confronted with new and difficult material typically are not organized in their thought processes, nor is it clear to them how to prioritize and focus upon the most salient information in order to independently proceed with related learning tasks (Ormrod, 2004).

The degree to which online learning can attend to multiple dimensions of teaching and learning is of paramount interest to the instructor. While online content is more accessible, obtaining information is only one stage of gaining command over complex content. Hofer, Yu, and Pintrich (1998) found that self-regulation of learning is difficult for most students. Students in online courses often have difficulty with comprehension and application of information (Schwartzman, 2007). Oh and Jonassen (2007) assert that merely providing information to students is insufficient – the nature of discourse in asynchronous online courses (postings and threaded discussions guided by the instructor) aligns poorly with the inherent complexity of learning processes associated with mastering complex course content.

Constructivism

Driscoll (2000) describes constructivism as a theory of learning that assumes that knowledge is constructed by learners via a formative process that relies not only on what is transmitted by the medium (instructor, text, audiovisual source) but also on the manner in which the learner makes sense of content within the context of his/her existing knowledge and experiences. Social constructivism extends these notions by asserting that learning is greatly dependent upon the interactions, collaboration, and social exchanges that occur in that learning context. Woo and Reeves (2007) outline multiple criteria for learning environments consistent with these theoretical orientations: Instructors who base learning environments upon these principles will 1) engage learners in authentic learning tasks; 2) create opportunities for meaningful collaboration among the instructor, experts, and other students; 3) engage the students themselves in defining, implementing, and negotiating perspectives relative to these tasks; 4) use collaboration, debate, and analysis to refine and complete the learning tasks; and 5) assure that students have access to the instructor, resources, and one another in order to clear points of confusion and expand concepts. "Such a meaningful interaction process is required for meaning making and hence learning (Woo & Reeves, 2007, p. 20).

Such approaches to teaching and learning have significant implications for the nature of the classroom and related environments. The instructional applications of email, online resources, typed threaded online discussions, and interactive online audio technologies need to be very deliberately designed if they are to ensure that learning environments consistent with the principles of constructivism are provided. Such design requires "change in pedagogical thinking toward student-centered classrooms with lots of constructivist, project-based activities, with opportunities for social discourse and collaboration between teacher and student, and between student and student" (Creighton, 2003, p. xiii). The difficulty of doing these things well online is the basis for the conclusion by Woo and Reeves that "despite the obvious advantages of the Web, relatively few authentic web-based learning programs have been developed and implemented at various levels of education" (p. 21). Others assert that computers and the Internet have exponentially expanded access to authentic instructional experiences via simulation, access to information and experts, virtual access to remote locations, complex manipulations of data, and sophisticated presentation capabilities (Woo & Reeves, 2007; Herrington et al., 2004). Comparing the capacities of face-to-face, online asynchronous, and online synchronous learning to facilitate knowledge transfer, Chen and Shaw (2006) found that for instruction sustained over substantial periods of time, there were no differences in learning outcomes among the three instructional modalities.

Various authors have studied collaboration among students in three instructional modalities: face-to-face, online synchronous, and online asynchronous sessions. Students tend to collaborate more extensively in the face-to-face and synchronous online sessions (Mabrito, 2006; Meyer, 2003). Meyer (2003) found that students believed that their contributions to asynchronous collaboration were of higher quality because of the expanded availability of time to craft and edit their postings.

The potential of web-based learning to enhance dimensions of constructivist learning approaches is significant, yet Woo and Reeves (2007) argue that the potential remains largely untapped in college classrooms. Wang and Woo (2007) found that the responsiveness of the instructor, interaction and communication between class participants, and the quality of the learning climate were lower in asynchronous online classes than in face-to-face instruction.

Interaction and Engagement

Theories of interaction and engagement are integrally connected to social constructivism. For students and instructors, interaction is an important dimension of university course work. Hirumi (2002) notes, however, that only certain dimensions of interaction are significantly related to higher achievement. Interaction that a) prompts intellectual insight, b) provokes analysis, and c) deepens commitment to instructional activities influences the quality of learning; sharing personal observations is of limited value. Savery and Duffy (1995) contend that the active engagement of students in discourse during analysis of complex problems prompts learning through comparative mental processes and enriches application of content to other problem-solving circumstances. The quality of interaction and engagement between instructor and students is related to both

student performance and to satisfaction; so, too, is the quality of collaboration among students themselves (Chickering & Gamson, 1987; Onwuegbuzie et al., 2007).

Perceptions of quality and level of immediacy and engagement in face-to-face and online instructions may differ. Bernard, Brauer, Abrami, and Surkes (2004) define online interaction as the ability to collaborate with peers and instructor. Wanstreet (2006) found that online interaction both between learners and between learner and instructor addresses learning-style preferences of students. The nature of interaction is, by extension, an important consideration in the design of online learning and in students' evaluations of the quality of their experiences in such courses. While a number of features of online course work lend themselves to interaction, the degree to which they fulfill student needs for interaction and immediacy can vary significantly.

Many researchers and experts laud the capacities of online media to enhance interaction and engagement. Threaded discussions, online chat, email, and, in some instances, two-way audio and video feeds expand the nature and richness of interaction. The asynchronous timing of much of this interaction also conforms better to the schedules of some students. "Technology provides an electronic learning mileux that fosters the kind of creativity and communication needed to nourish engagement" (Kearsley & Shneiderman, 1998, p. 7). Ho and Swan (2007) note the capacity of online instruction to assure a more democratic approach to interaction because domination of the online "dialogue" by any one individual is less likely to occur. They also found that frequency, manner, and quality of contributions were positively correlated with final course grades.

Other researchers raise questions about the quality of interactions online. Wanstreet (2006) observed that research that reflects positively on online communication in college courses typically focuses more upon the quantity rather than quality. Zhang and Walls studied the degree to which online instruction addressed the previously described dimensions of instructional effectiveness developed by Chickering and Gamson. They found that the elements of "encouraging cooperation among students and encouraging student-faculty contact were least frequently practiced" in online instruction (Zhang & Walls, 2006, p. 420). Mazzolini and Maddison (2005) noted that the frequency, timing, and nature (e.g., clarifying, posing questions, answering questions) of an instructor's contributions to online postings and threaded discussions are negatively correlated with the frequency and length of student postings.

Summary

The literature on the capacities of online instruction to address important dimensions of effective college learning environments is mixed. Of great significance to the present study was the dearth of literature addressing certain online instructional delivery systems, such as synchronous interactive online instruction. SIOI technology, which is still relatively new, provides synchronous online classrooms that are enhanced by two-way audio features that allow real-time oral presentation, discourse, and checks for understanding among instructor and students. The absence of such studies, however, makes it particularly difficult to draw conclusions about the

capacity of this form of online learning to address key elements of instructional effectiveness and to compare these capacities to those inherent in face-to-face and online asynchronous classrooms.

Methodology

Introduction

This study examined the SIOI course medium from two vantage points: 1) instructor perceptions regarding the quality of courses delivered via online instruction, and 2) student perceptions regarding the quality of courses delivered via online instruction.

Qualitative Study of Instructor Perceptions

The qualitative component of this study addressed instructor perceptions regarding the quality of courses delivered via online instruction. Qualitative research involves an examination of what people said about their experiences, dispositions, and thoughts as they relate to a specific phenomenon. Heidegger (1962) described the phenomenological approach as "that which shows itself in itself" (p. 51). Crotty (1998) noted phenomenology is an attempt to gain an in-depth understanding of the human experience.

Specific research questions were examined within the context of the qualitative study that examined instructor perspectives regarding online courses:

> Were there challenges to implementing a synchronous interactive online instructional (SIOI) format?
>
> Was the process of social interaction in the SIOI environment productive?
>
> Were professors able to provide a quality learning experience via SIOI format?

In the spring of 2007, the University of Southern Mississippi provided SIOI technology for professors interested in a course delivery system that employs a synchronous interactive online instructional format. The following semester, the researchers proceeded with participant selection and research processes pursuant to the phenomenological tradition. The population (N = 14) for the qualitative study of instructor perceptions regarding the quality of courses delivered via online instruction included all professors teaching SIOI-enabled courses at the University of Southern Mississippi. Seven (50%) of the faculty members responded.

Survey research was the method used for gathering data from faculty participants who were implementing SIOI technology. A structured questionnaire, which also contained opportunity for open comments, was developed. Qualitative data analysis involved identifying, coding, and categorizing patterns found in the data.

Having coded and analyzed the data, a narrative was prepared to further disseminate research findings. The individual's interpretation of an event comprises reality for that individual (Bogdan & Biklen, 1982). The goal of the researcher is to understand the research environment, the individuals, and their behavior. Glesne and Peshkin (1992) noted that analysis is an immediate and ongoing process of qualitative research.

Quantitative Study of Student Perceptions

Specific research questions were explored within the context of the quantitative study that examined student perceptions regarding the quality of courses delivered via online instruction:

> What are students' perceptions regarding the quality of their learning experiences in synchronous interactive online instruction (SIOI)?
>
> Are there statistically significant differences among the ratings of students regarding the degree to which course quality criteria are met through face-to-face, asynchronous online, and synchronous interactive online instruction (SIOI) course formats?
>
> Is there a relationship between demographic characteristics of students and their perceptions regarding the quality of their learning experiences with synchronous interactive online instruction (SIOI)?
>
> Is there a relationship between demographic characteristics of students and their perceptions of the degree to which course quality criteria are met through face-to-face, asynchronous online, and synchronous interactive online instruction (SIOI) course formats?

In the spring of 2007, the University of Southern Mississippi provided SIOI technology for professors interested in a course delivery system that employs a synchronous interactive online instructional format. The sample population for the quantitative study of student perceptions regarding the quality of courses delivered via online instruction included all students enrolled in SIOI-enabled graduate courses included in the program of studies for educational leadership at the University of Southern Mississippi during this and four subsequent semesters.

The quantitative study of student perceptions employed a survey instrument designed by the researchers and entitled Survey of Opinions of Users of SIOI. The instrument included items through which survey completers provided demographic information, assessments of their proficiencies with various computer applications, and assessments of the utility of particular utilities of the SIOI technology. A section of questions regarding overall impressions regarding this medium was included. Numerous authors have, over time, assembled models that outline criteria to assess the quality of teaching and learning in university courses. Chickering and Gamson's (1987) dimensions of effective college instruction were adapted to provide a section in which students compared the capacities of face-to-face delivery, SIOI, asynchronous online

instruction, and other online modes of course delivery. Data were analyzed using descriptive, differential, and correlational statistical techniques.

Results

Qualitative Study of Instructor Perceptions

Relatively few instructors at the University of Southern Mississippi in 2007 delivered courses via synchronous interactive online instruction (SIOI). Of the 14 using this platform at the time of this study, seven (50%) participated. Users and respondents were broken down as follows: College of Education and Psychology – 6 users, of whom 5 responded; College of Science and Technology – 7 users, of whom 1 responded; College of Business – 1 user, who also responded. In light of this relatively small number, the researchers view the data from this portion of the study to be a work in progress. That said, early analysis of results yielded findings of interest.

Research Question 1: Were there challenges in implementing a synchronous interactive online instructional (SIOI) format?

Table 1

Challenges Confirmed and Identified by Respondents

Question 1	(5) Strongly agree	(4) Agree	(3) Neutral	(2) Disagree	(1) Strongly disagree	(NA)
Implementing a synchronous interactive on-line instructional format (SIOI) presented certain challenges.	*n* = 3 43%	*n* = 2 29%	0	*n* = 1 14%	0	*n* = 1 14%

Five respondents (72%) agreed or strongly agreed there were significant challenges associated with the implementation of SIOI. Challenges identified by professors in this study were three-fold. Technical issues, mastery of the SIOI collaborative operating system, and, lastly, the necessary time commitment related to planning and preparation were identified.

Technical issues included but were not limited to audio difficulties, Internet access and connectivity issues, log-on problems, and WebCT inaccessibility. Learning and then practicing to become proficient with all the "bells and whistles of this medium" presented a different set of challenges for respondents. One professor noted, "It takes time for the use of the console to become second-nature." SIOI requires a continuous technology focus and therefore, "… trying to teach and troubleshoot technology problems was also quite challenging." The fact that everything happens in real time is another consideration. Lastly, one respondent admonished, "…plan well ahead of time to insure content, pedagogy, and technology goals are met…the time commitment is quite high in terms of getting the students and presenters ready for a problem-free live classroom session."

Research Question 2: Was the process of social interaction in the SIOI environment productive?

Table 2

The Nature of Social Interaction in SIOI

Question 2	(5) Strongly agree	(4) Agree	(3) Neutral	(2) Disagree	(1) Strongly disagree	(NA)
Social interaction between instructor/ students and student/students was a meaningful and productive process in the SIOI experience.	*n* = 2 29%	*n* = 4 57%	0	0	0	*n* = 1 14%

Six respondents (86%) agreed or strongly agreed social interaction between instructor/students and student/students was a meaningful and productive process in the SIOI experience. Respondents indicated social interaction can be enhanced by using multiple console features such as "chat box…online polling…email…telephone outside of class…meeting in groups…meet and greets prior to class…and breakout rooms for some class activities." This category emphasizes utilization of tools within SIOI to accentuate the social interaction process.

A second area of interest was the students' and professors' purpose for social interaction within the synchronous interactive online instructional format. Collaboration is viewed by the researchers as a dimension of the process of social interaction. As one respondent noted, "If the social interaction fails to be meaningful then the process will soon become unproductive." Adding emphasis to this point, another respondent observed, "As with learning communities themselves, students return again and again to valuable information sources….to the extent that collaboration is meeting the needs of the learner it is a valuable student-centered entity." Advancing this perspective on the role of "purpose" in social interaction, another respondent concluded, "The success of live classroom [SIOI] is more dependent on the facilitation and front-end work by the instructor." However, one respondent advanced the concept that students seek to find a purpose through identity; he noted, "During this [social interaction] process they [students] struggle to forge an identity in the new online environment.

Research Question 3: Were professors able to provide a quality learning experience via SIOI format?

Table 3

Respondents' Comments on Quality Learning

Question 3	(5) Strongly agree	(4) Agree	(3) Neutral	(2) Disagree	(1) Strongly disagree	(NA)
The instruction offered through SIOI provided a quality learning experience for students.	*n* = 3 43%	*n* = 3 43%	0	0	0	*n* = 1 14%

Positive student evaluations [ratings] were mentioned by some respondents as evidence of a quality learning experience. One respondent noted, "I base this seemingly self-congratulatory rating on the anonymous ratings of students." Another shared, "Live classroom was rated by students as the most beneficial aspect of the course offering." Student opinion with regard to quality learning was an important factor for professors. Several respondents were aware of student perceptions; one declared, "Based on previous student feedback, many felt that 3-4 live classroom sessions is all that is desired."

There is a solemn warning as one respondent observed, "The SIOI application is often criticized because of frequent technological lapses… a negative image tends to label the learning experience as unreliable, burdensome and unproductive." The implication was that frequent user problems will brand the SIOI technology unfairly. Still another respondent offered a conditional perspective; he noted, "The quality learning experience seems directly proportionate to the institution's commitment to service and support."

Two respondents qualified their responses when commenting on whether SIOI provided a quality learning experience. The first responded, "The verdict is still out because I have two different experiences as I have presented." Again, the respondent is referencing frequent technological problems as a matter of concern. The other respondent in this category acknowledged a good evaluation but concluded, "I know we can get better—and will!"

Six respondents (86%) agreed or strongly agreed that the instruction offered through SIOI provided a quality learning experience for students. In summary, the professors as respondents indicated student evaluations, problem-free online sessions, and continuous service/support from the university were determinants in the quality learning process.

A final question was posed to respondents. Instructors were asked whether, as a result of using SIOI, they were likely to continue to offer courses in this instructional format. Five of the respondents (72%) indicated that they were more likely to offer courses online because of this instructional format. One indicated that SIOI had no impact on the willingness to offer courses online. None of the respondents indicated that they were less likely to offer courses online.

Table 4

Respondents' Inclination toward Future Use of SIOI Format

Question	(1) I am more likely to offer online courses because of this instructional platform.	(2) This instructional platform has not affected my willingness to offer online courses.	(3) I am less likely to offer online courses because of this instructional platform.	(4) Other (please construct your own response):
SIOI affected my attitude toward online course delivery in the following manner:	*n* = 5 72 %	*n* = 1 14%	0	*n* = 1 14%

Quantitative Study of Student Perceptions

The Survey of Opinions of Users of SIOI was administered to all students enrolled in SIOI-enabled graduate courses included in the graduate program of studies for educational leadership at the University of Southern Mississippi. Surveys were administered to 124 students, and 95 completed the instruments, thus providing a response rate of 77%.

The survey instrument administered to students in SIOI-enabled classes included questions regarding demographic descriptors of the participants. Among the 93 respondents reporting age, ages ranged from 24 – 60 years, with the majority (*n* = 45) falling between 30 and 39 years. Twenty-nine students were between 40 and 49 years. Eleven participants were younger than 30 years and eight were 50 years and older. The mean age was 37.84 years.

Females comprised nearly two-thirds of the sample (61.1%, *n* = 58); whereas, males made up 38.9% (*n* = 37). Among those reporting professional role, respondents included teachers (68.9%, *n* = 62), administrators (20%, *n* = 18), and 'other' (11.1%, *n* = 10).

Research Question 1 was stated as follows: "What are students' perceptions regarding the quality of their learning experiences in synchronous interactive online instruction (SIOI)?" Question 14 on the survey was stated as follows: "On a scale of 1 to 5, with 1 being the lowest rating and 5 being highest, what rating would you give to your overall experience with SIOI in this course?" Table 5 illustrates both the mean and the frequencies associated with each rating.

Table 5

Mean and Frequencies of Ratings of Overall Experience with SIOI

	N	Mean
Mean of participants' ratings	92	4.24
Frequencies		
Rating 1 (lowest rating)	0	
Rating 2	3	
Rating 3	9	
Rating 4	43	
Rating 5 (highest rating)	37	

Research Question 2 was stated as follows: "Are there statistically significant differences among the ratings of students regarding the degree to which course quality criteria are met through face-to-face, asynchronous online, and synchronous interactive online instruction (SIOI) course formats? The pertinent item (Item 17) of the survey instrument was stated as follows:

> Using the criteria in the table below, rate the dimensions of instructional effectiveness in courses delivered in the following formats:
>
> - SIOI
> - Asynchronous online format
> - Face-to-face
> - Other distance delivery format (e.g., closed circuit video link connecting instructor/ classroom).

The scale used is 1 to 5, with 1 being the lowest rating and 5 being highest.

The mean student rating for the quality of each course format relative to each dimension of instructional effectiveness is provided in the related column of Table 6. Because of the nature of the wording of the questionnaire items to align with Chickering and Gamson's seven principles, it was not possible to determine a summary rating for each of the three class formats and make a direct overall comparison. However, in comparing each of the dimensions across the three formats, several differences were suggested. ANOVA's were employed to discern these differences among ratings of each dimension of instructional effectiveness among the SIOI, asynchronous online, and face-to-face modes of delivery.

Student ratings for the following dimensions of instructional effectiveness were not significantly different when contrasting face-to-face and SIOI formats; however, the ratings for both face-to-face and SIOI formats were significantly higher than the ratings for asynchronous online learning ($p < .001$):

- encouraged student-faculty contact
- encouraged cooperation among students
- encouraged active learning
- provided prompt feedback to students
- emphasized on time on task
- communicated high expectations
- respected diverse talents and ways of learning.

Three dimensions of instructional effectiveness in courses taken were added by the authors to those developed by Chickering and Gamson (1987). Students were asked to rate the quality and amount of content learned across the three instructional formats. There were significant differences in the perceptions of quality of learning when comparing different formats ($p < .001$). While SIOI ($M = 4.71$) and face-to-face ($M = 4.73$) formats were not different from each other, both were rated higher than the asynchronous format ($M = 3.96$). Student ratings for the degree to which the SIOI format assured ease of access to the course were not significantly higher than the ratings for the asynchronous online learning format. The ratings for both were significantly higher than the ratings for the face-to-face format in this quality dimension ($p = .023$). Student ratings for the degree to which the various formats minimized costs (other than tuition) of taking the course were not significantly different for SIOI and asynchronous formats, but both were significantly higher than face-to-face format ($p = .034$).

Table 6

Mean Student Ratings of the Quality of Course Formats Relative to Dimensions of Effective College Instruction

Dimensions	SIOI format (SIOI) Mean, *SD*	Min - Max	Asynchronous online format Mean, *SD*	Min - Max	Face-to-face format	Min - Max
The quality and the amount of the content learned	4.71 (.622)	2-5	3.96 (.735)	3-5	4.73 (.450)	4-5
Encouraging student-faculty contact	4.34 (.814)	2-5	2.84 (1.09)	1-5	4.67 (.596)	3-5
Encouraging cooperation among students	4.04 (1.26)	1-5	2.69 (1.14)	1-5	4.38 (.979)	1-5
Encouraging active learning	4.29 (.991)	1-5	3.01 (1.02)	1-5	4.40 (.904)	1-5
Providing prompt feedback to students	4.41 (.825)	2-5	2.89 (1.02)	1-5	4.48 (.690)	3-5
Emphasizing time on task	4.21 (1.13)	1-5	3.05 (1.28)	1-5	4.31 (.924)	1-5
Communicating High Expectations	4.45 (.932)	1-5	3.26 (1.24)	1-5	4.54 (.645)	3-5
Respecting diverse talents and ways of learning	3.97 (1.16)	1-5	2.94 (1.25)	1-5	4.26 (1.02)	1-5
Ease of access to the course	4.39 (1.04)	1-5	4.09 (1.23)	1-5	3.70 (1.07)	1-5
Minimizing costs (other than tuition) of taking course	3.97 (1.27)	1-5	3.68 (1.31)	1-5	3.57 (1.22)	1-5

Research Question 3 was stated as follows: "Is there a relationship between demographic characteristics of students and their perceptions regarding the quality of their learning experiences with synchronous interactive online instruction (SIOI)?" Items 14 – 16 on the survey read as follows:

> 14. On a scale of 1 to 5, with 1 being the lowest rating and 5 being highest, what rating would you give to your overall experience with SIOI in this course?

> 15. Would you take another course via SIOI? (Yes, No, Maybe)
>
> 16. Would you recommend a course taught via SIOI to others? (Yes, No, Maybe)

The mean rating for overall experience with the SIOI format (item 14) was 4.24 on a 5-point scale. In response to item 15, "Would you take another course via SIOI?," seventy-five (85.2%) answered "yes," ten (11.4%) said "maybe," and three respondents (3.4%) said "no." When asked whether they would recommend a course taught via SIOI to others (item 16), 84.5% responded "yes," 12.8% responded "maybe," and 2.6% said "no." Chi-square analyses were employed to evaluate relationships among gender or professional role and the responses to items 14, 15, and 16. No significant relationships were discerned. While not statistically significant (p = .051), there is some indication that the reported overall experience with SIOI format is negatively related to the age of the respondent.

Research Question 4 was stated as follows: Is there a relationship between demographic characteristics of students and their perceptions of the degree to which course quality criteria are met through face-to-face, asynchronous online, and synchronous interactive online instruction (SIOI) course formats? Chi-square analyses were employed to evaluate relationships among professional role and the responses to the items addressing dimensions of instructional effectiveness, which are profiled in Table 6. No significant relationships were found with the exception that teachers, less so than administrators, reported that the asynchronous format respects diverse talents and ways of learning. In comparing gender ratings for SIOI, asynchronous, and face-to-face dimensions, there were no differences for the asynchronous dimensions. Females rated the quality and amount of content learned somewhat higher than males (females, M = 4.81; males, M = 4.67) for the SIOI, as well as for face-to-face course formats, though the differences were not significant. Females did, however, rate quality and amount of content learned significantly higher than males for asynchronous format courses. Females also rated the respecting of diverse talents and ways of learning higher in the SIOI format than did the males. T-test analyses further revealed gender differences in student perceptions of several dimensions of instructional effectiveness when face-to-face instruction is used. The ratings of women concerning the degree to which the face-to-face format encouraged both cooperation among students and active learning as well as assured the provision of prompt feedback to students, emphasis on time on task, and the communication of high expectations were significantly higher than the ratings given by men for these same dimensions of instructional quality ($p < .05$).

Discussion and Conclusions

Many university instructors question whether the quality of learning achieved by students in a face-to-face environment can be paralleled in an online format, especially for novel and complex content. This study examined instructor perceptions of the merits of synchronous interactive online instruction (SIOI). Student respondents provided perspectives on the relative capacities of

face-to-face, SIOI, and asynchronous online learning to address dimensions of instructional effectiveness. Although corrections were used for the alpha levels before reporting significant differences among student ratings, these results should nonetheless be interpreted with some caution due to the large number of analyses employed. Additional caution is warranted in light of the relatively small number of participants and the fact that they were enrolled in a single professional discipline, educational leadership. Finally, a distinction needs to be drawn between *perceptions* of the quality of instruction/learning and the actual *measurement* of the quality of instruction/learning. This study addressed the former.

The analysis of responses suggests that while the format presents challenges, instructors view SIOI favorably. These respondents evaluated the quality of learning in these classes positively, and were, in general, pleased with the nature of student-to-instructor and student-to-student interaction in these classes. Given the literature's frequent references to the premium that instructors attach to these dimensions of learning, these findings are instructive, particularly to faculty members who are disinclined to offer instruction online.

Students also gave positive ratings to the overall quality of the learning experience in SIOI-enabled courses. A significant majority indicated that they would be willing to take another course offered in the SIOI medium, and a similar majority was willing to recommend the SIOI format to other students.

Based on dimensions of instructional effectiveness, students compared SIOI-enabled courses to those offered face-to-face and in an asynchronous online format. While the ratings of the amount and quality of content learned were the same for SIOI and face-to-face course formats, mean student ratings for the dimensions of instructional quality tended to be slightly higher for face-to-face instruction than for SIOI; these differences, however, were not statistically significant. These findings are important as they suggest to an instructor who is reluctant to employ online learning that students perceive that it is possible to achieve levels of effectiveness in an online instructional format similar to those that are realized in face-to-face delivery.

Asynchronous online learning, on the other hand, was perceived to be inferior to both face-to-face and SIOI formats in addressing dimensions of instructional quality. Mean ratings by students of the capabilities of asynchronous online learning to address these dimensions were consistently and significantly lower than the ratings for both face-to-face and the SIOI formats. These findings will likely reinforce the reluctance of some instructors to offer online instruction if the only option for delivery is an asynchronous format. As Barnes (2003) observes, "The online format must assist in making information more understandable and relevant to students."

Two additional dimensions of quality, ease of access and minimizing costs (other than tuition) of taking the course, were rated by students as being significantly higher for the two online formats than for the face-to-face format. In an era of escalating fuel prices, recessionary economic trends, and increasing awareness of access to online instructional opportunities, these are not surprising findings for course offerings that typically allow students access from home.

While not statistically significant, there is evidence of some concern relative to the quality of student collaboration in SIOI-enable courses. The ratings for this dimension, as well as the dimension of student-faculty contact, were significantly lower for the asynchronous mode. These concerns are more significant when the results are analyzed by gender. The challenge to online faculty is obvious – for these important elements of instructional effectiveness to be adequately addressed, instructors will need to capitalize on those mechanisms for interaction and collaboration that are available.

Future study is warranted. As the use of synchronous interactive online learning expands in post-secondary instruction, it will be useful to survey additional instructors and students participating in SIOI-enabled courses. "The bottom line is that to increase the learning effects of online interaction, we should, first of all, understand clearly the nature of interaction within the framework of social constructivist learning theory. Once we gain such an in-depth understanding, we should be able to engage in productive research and development to identify the necessary design principles for implementing more effective interaction activities within Web-based learning environments" (Woo & Reeves, 2007, p.23).

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How do Students Measure Service Quality in e-Learning? A Case Study Regarding an Internet-based University

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Abstract: This article discusses the importance of measuring how students perceive quality of service in online higher education. The article also reviews the existing literature on measuring users' perceptions about quality in e-services. Even when there are a lot of articles on this matter, none of them focuses on e-learning services, so this paper tries to fill that gap. The article proposes using the Critical Incident Technique to perform a qualitative analysis, which contributes to identify the main dimensions and categories that contribute to students' perception of service quality. A case study, regarding a completely online university, is presented and the proposed model is used to obtain some preliminary research results. Among these, key quality dimensions from a student point of view are identified. Some of these dimensions are: learning process, administrative processes, teaching materials and resources, etc. After discussing the research results, a list of recommendations for university managers is formulated. We believe that both the proposed methodology and the case-study recommendations can be of potential interest for managers of several universities offering online higher-education worldwide.

Keywords: online higher education, perceived service quality, critical incident technique, qualitative data analysis

1. Introduction and motivation

Universities worldwide must face, among other challenges, an increasingly differentiated demand for education, the need to carry out more commercial activities in order to obtain new sources of funding, and new competitors that make use of Information Technologies (ITs) to offer their educational services in a global market. All together, these factors are forcing universities to rethink their traditional roles, to develop new organizational structures and to reposition themselves through strategic direction setting (Moratis and van Baalen 2002). These trends and the widespread recognition that the university's invisible product, knowledge, is the most important factor in economic and social growth are the reasons for the increasing competitiveness inside the higher education market all over the world. To be successful in this environment, universities should focus on customers' perceptions of service quality –understanding 'service' in the broad sense, including both academic and non academic services– since those perceptions are a key influence on students' decisions when they are choosing or recommending a particular institution.

While there is little disagreement on the importance of service quality issues in higher education, the challenge is to identify and implement the most appropriate measurement tools in order to gain a better understanding of the quality issues that impact on students' service experiences (O'Neill and Palmer 2004). In other words, knowing what customers expect is the first and possibly most critical step in delivering quality (Zeithaml and Bitner 2003).

Following the general pattern set by service industries, the issue of service quality within the higher education sector has received increasing attention in recent years. The most dominant theme is the development of valid, reliable and replicable measures of perceived service quality (PSQ). In the early stages, most models designed to evaluate PSQ focused exclusively on teaching and learning. In the last decade, though, several studies have approached the evaluation of university services from a broad perspective, considering not only the core service but the peripheral or auxiliary administrative and backup services as well (Abdullah 2005).

This study continues this line of research by applying a holistic conception of service quality in online higher education.

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2. Related work and added value of our approach

The recent literature describes measurement tools and techniques for assessing PSQ within the higher education sector. For the most part they are extensions or adaptations of SERVQUAL models (Buttle 1996), where service quality is the result of a comparison between expectations and perceptions of performance, e.g.: SERVPERF (Oldfield and Baron 2000) or IPA (Ford et al. 1999, Joseph et al. 2005). While those models were initially designed to be applicable across a broad spectrum of service settings, many studies have stressed that the industry-specific characteristics of many services mean that these models should be adapted or supplemented to fit the characteristics of the particular service under analysis (Cox and Dale 2001, Chen 2002). Given these considerations, the relatively large number of articles on the subject of evaluating PSQ in higher education is in contrast to the almost total absence of such work with regard to higher-education in online environments.

The digital nature the interactions produced in an online environment is a source of some problems for applying the classical PSQ evaluation models:

- Most of the items used in these scales are linked to the direct interpersonal interaction that characterized 'traditional' services. Therefore, even those who advocate the use of these scales in virtual environments acknowledge that, in the absence of these traditional interactions, the scales need to be adapted to the specific e-service context (van Riel et al 2001).
- The absence of physical reference points or indicators of quality of service, such as premises, facilities, and service staff. In the traditional university these tangible elements make up what is known as the 'servicescape' which is a decisive factor in PSQ evaluations (O'Neill and Palmer 2004). In online learning environments, the student does not have at his/her disposal the conventional physical elements that act as indicators of the quality of service. In their place, the student can only use other variables, such as the aesthetics and ease of use of the online interface, referred to as 'e-scape' (van Riel et al. 2004).
- Students are not just users of university services, but are the universities' primary customers. Consumers are often part of the production and levier processes of services (Grönroos 1990), but in online higher-education the role of the student is even greater, since it is essential that he/she should be the centre of the teaching/learning process. Moreover, as the user of a digital interface, the online student will need a certain degree of skill and experience in working with ITs (Juan et al. 2008). Consequently, the students themselves contribute directly to the quality of service delivered and to his/her own satisfaction or dissatisfaction.

Although there are many models for assessing PSQ in online environments are available, they have been designed exclusively to assess service quality of web sites and, specifically, of online shopping sites. The aforementioned were not designed to evaluate the quality of pure and complex services, such as the educational ones, which do not involve just a single transaction, but multiple interactions that take place over a prolonged time span. Specifically, in the case of online higher education, important questions, both empirical and theoretical, have just begun to be addressed. Most of the published studies focus on specific services –e. g. an online university library (O'Neill 2003)– or on particular sections –as, for instance, teaching resources (De Lange et al. 2003)–, but to date no holistic evaluation of PSQ, that captures the online student's overall service experience in online learning environments has been carried out.

3. Research scenario: The Open University of Catalonia (UOC)

The Open University of Catalonia or UOC (http://www.uoc.edu/portal/english) is a fully online university with headquarters in Barcelona, Spain. It was founded in 1995 by the Catalan Government with the mission of "providing people with lifelong learning and education through intensive use of information and communication technologies". According to official data, the UOC offers educational services over the Internet to more than 50,000 students, distributed in several undergraduate and graduate programs. Figure 1 shows the distribution of students in Bachelors Degrees (23,671), Diplomas (16,593), Open Programmes (8,712), etc.

UOC students belong to different parts of the world, but they are mainly located in Spain and South America. About 60% of UOC undergraduate students are adult students (over 30 years old) that typically combine their professional activity and/or family responsibilities with their academic duties. Educational services are delivered by a team composed of more than 2,200 instructors –including UOC faculty and UOC online collaborators, most of these professors from other Spanish universities– and 550 management staff. The UOC uses an asynchronous and student-centred educational model and has already received several international prizes, such as the 2001 ICDE Prize for the best virtual and distance university in the world or the 2004 OEA Prize for educational quality. Currently, up to 22 accredited degrees and official masters are offered via the UOC Virtual Campus, a learning management system entirely developed and maintained at the UOC (Figure 2). Some of the most popular degrees (in number of registered students) offered at the UOC are as follows: Computer Engineering, Business Administration and Management, Psychology, Telecommunications, Information and Communication Sciences, Law, and Humanities.

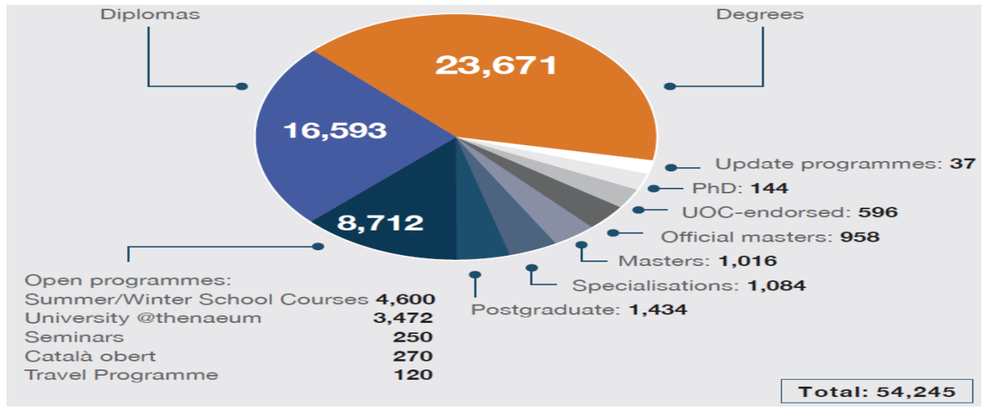

Figure 1: Distribution of UOC students by type of studies

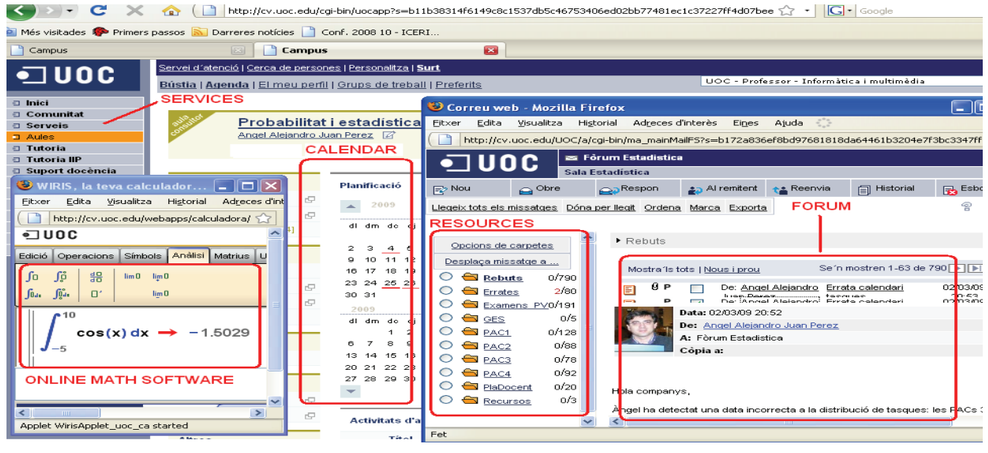

Figure 2: A screenshot of the UOC Virtual Campus with some of its functionalities

4. Research methodology

The identification of the qualitative functional sections of service quality was carried out using a qualitative method referred to as the Critical Incident Technique (CIT). CIT was introduced in the social sciences more than fifty years ago by Flanagan (1954) and has been used in a variety of contexts in recent years to explore service research issues. The critical incident technique aims to contribute to improving our understanding of the activity or phenomenon by using an original approach: the reporting of the events that make up a specific experience by the person or persons involved. The method uses a survey or a similar procedure to obtain a catalogue of critical incidents.

This catalogue is then compiled and analyzed to determine the key dimensions or sections that affect quality of service as measured by the consumers.

The data (critical incidents) collection process comprises two stages. In the first stage, consumers are interviewed and specific information about the service is obtained. In the second stage, data is classified in categories which are intended to represent different sections of service quality. In the first stage of our study, an e-mail was sent to a random sample of UOC students. The theory recommends interviewing a minimum between 10 and 20 consumers. That way, if one of them provides false or mistaken information, his/her point of view can be compared and contrasted with data from other individuals. The selected individuals are usually asked to report between 5 and 10 positive and 5 and 10 negative examples of their user experience regarding the analyzed service.

We sent students an e-mail with some standard examples of critical incidents (Figure 3), so that they had a better idea of the kind of feedback we were expecting from them. To avoid biased responses as much as possible, we decided that those standard examples should be related to a health service instead of an academic service. We sent this e-mail to a considerably larger number of students, asking them to record approximately five positive and five negative critical incidents related to the different services they received during a complete course. We did this because the response rate in online surveys tends to be low –typically between 10% and 30%– and because it was simpler to interview a larger number of subjects than to ask each student to record a higher number of incidents. In this way, we avoid the risk of presenting a complicated and time-consuming survey, which would have an even more negative effect on participation. The main aim of this stage was to obtain a minimum of 200 critical incidents, a number that is considered theoretically adequate. Eventually, a total of 41 (21 men and 20 women) took part, reporting 392 critical incidents, of which 12 were rejected because they had not been correctly formulated. The sample thus comprised 380 valid critical incidents.

Dear student,

We are currently conducting a research project aimed at analyzing the factors that determine students' perception on the quality of e-learning services.

The first stage of this study requires the collaboration of a group of randomly-selected students. We would like to kindly ask for your collaboration in this project. All you have to do is answer this message **reporting 5 positive** and **5 negative incidents** related with **services provided to you by UOC**.

Please, consider the following examples of incidents that might serve you to understand the kind of opinions we are looking for. Imagine that you visit your local health centre. Some examples of incidents related with the quality of the service you receive might be:

* Positive: (1) "the person at the information desk was helpful", (2) "the doctor carried out a thorough examination", …

* Negative: (1) "I had spent too much time in the waiting room", (2) "the doctor used a lot of technical terms that I could not understand".

We would like you to report specific situations, examples or experiences –either recent or from the past– regarding your relationship with the UOC. The situations can include any service provided by the UOC –not only the basic teaching service. Please, try to be as clear and specific as possible, avoiding abstract comments such as "the service was good".

Notice that all the information provided in this study will be completely confidential.

Thank you very much for your participation and your assistance in this matter.

Yours sincerely,

Figure 3: E-mail sent to students

The incidents were analyzed as follows: First, they were grouped according to type. For each type a sentence was written to describe the incident; both positive and negative incidents were included. Once all the critical incidents were grouped together the above process was repeated, now using the similarity between the sentences describing the incidents as the criterion. We thus obtained a hierarchical relation between critical incidents, their aggregate descriptions and, finally, the sections of quality.

The key stage in the process was the creation of two work teams. To monitor this process, responsibility for the task was assigned to two different teams (each of them composed by two professors from different knowledge areas): the first established the sections of quality following the generalization procedure described above and the second, using the sections established, directly assigned each of the critical incidents to one of these sections. The accuracy of the distribution process depends on the degree of agreement between the teams, that is, of the percentage of incidents that both place in the same section. Total agreement is represented by a score of 1. We obtained a score of 0.91, which should be considered satisfactory, taking into account that the literature considers an index of above 0.8 to be acceptable. Finally we checked the accuracy of the sections in order to determine whether they were able to define the construct of service quality in its entirety. To do this, we randomly extracted around 10% of the critical incidents (35) and then regrouped and reclassified the remaining incidents in the sections. We then re-assigned to these sections the 35 critical incidents that we had removed.

Since we were able to place all these incidents in the sections, we concluded that they presented a reliable reflection of the constructed model. The categorization process highlighted the need to reject incidents which did not contain specific examples or experiences of the service received but reflected more general impressions, such as the advantages of online learning –time saving, availability, ease of access, the opportunity to combine studies and work, etc.– and its drawbacks –the feeling of isolation, the need to adapt to the environment, etc. (Juan et al. 2009). Among these comments, the opportunity to combine studies and family and professional life was highly valued by a part of the population who otherwise would not be able to study. After this process of refinement we had 350 critical incidents, of which 184 were positive and 166 negative. Once the classification process was completed, and after checking the validity of the process, these critical incidents were finally grouped in 6 sections covering 33 definitions. Table 1 summarizes the sections or dimensions obtained.

Table 1: Critical incidents reported by dimension

Section or dimension	Positive critical incidents	Negative critical incidents	Total number of critical incidents	Percentage of critical incidents
Learning process	79	60	139	40%
Administrative processes	31	48	79	23%
Teaching materials and resources	26	21	47	13%
User's interface	23	23	46	13%
Relationships with the community network	25	5	30	9%
Fees and compensations	0	9	9	3%
Total	*184*	*166*	*350*	*100%*

5. Analysis of results

As can be seen in Table 1 the first dimension or section, learning process, accounts for about 40% of total critical impacts. This section represents the core service of any higher-education institution, and it includes categories such as the following ones: course design, learning planning, homework workload, instructors' guidance and support, homework contribution to learning, instructors' feedback, assessment system, instructors' responsiveness, accuracy of responses and instructors' courtesy. A total of 27 critical incidents were reported in this section referring to the guidance and support of the learning process by instructors. Some examples of these incidents are the following ones: "excellent guidance from instructors", "some of the instructors in this course just sent an e-mail on each important deadline, but they did not perform any other action to encourage or guide students in the meantime", etc. In this sense, students reported a large number of critical incidents (up to 9% being negative incidents) related with either the absence of personalized feedback from instructors. Another category that received a considerable number of critical incidents was the assessment process. From its 21 associated incidents, it can be derived that, on the average, UOC students have a positive view of our continuous assessment system, which "motivates to study regularly and to learn more about some advanced topics". However, students also seem to have a negative view of the "excessive number of tests and homework activities that they need to complete in some courses". Another two categories that can be considered as relevant in this section are those related to the course design and to the length of the response time-interval (i.e., the time between a student's request submission and its corresponding instructor's response).

The second section, in terms of relative importance, is the one related to administrative processes. It represents about 23% of the critical incidents reported, and it relates to the so-called 'facilitating services', that is, services that are indispensable for the rendering of the essential service even when they are not part of this essential service. In the case of our university, these services include all administrative processes, such as secretary's office (registration, certification, prior learning assessment, etc.), the organization of face-to-face final tests, the handling and shipping of documentation (both of academic and administrative nature) and the professional performance of our administrative staff in terms of responsiveness, courtesy and accuracy of responses.

The third section, teaching materials and resources, recorded 47 critical incidents (13% of the total number of incidents), 26 positive and 21 negative. According to the UOC pedagogical model, this section can be considered as being an integral part of the essential service. Nevertheless, it has been considered apart from the learning process because it has enough entity on its own. The section can be divided into the following three categories: contents (e.g. "it is good to use updated learning materials", or "materials seem too superficial to me"), library (covering both resources availability and library general performance) and format.

The fourth section, user's interface, covers some service aspects related to the usability and technical performance of the UOC Virtual Campus and also of the university staff that provides online technical support to students and instructors. These categories are directly related with the fact that the kind of service being offered is an Internet-based one. Therefore, according to (Grönroos, 1990), it also reflects a facility service. The highest percentage of (positive) critical incidents in this section is found to be associated with the usability or browsing capabilities of the UOC Virtual Campus, that is, how simple and intuitive is the browsing inside the online learning environment (e.g. "Browsing the virtual learning environment is really easy"). The remaining two more representative categories of this section are those related to the reliability and connectivity levels of the UOC Virtual Campus. Some examples of positive critical incidents related to these categories are: "(...) everything works well: sending files and downloading materials (...)", or "access to the campus was problem-free". Also, some examples of negative critical incidents for these categories are: "I've suffered problems every time I've tried to download the materials for this course, especially at the beginning of the semester and Sunday evenings", or "I've had difficulties when trying to connect and access the campus during the last days". Within this section, only a small percentage of incidents (about 2%) refers to the responsiveness, accuracy of responses and courtesy of the technical staff.

Students have also reported 30 critical incidents, most of them positive, related to the section relationship with the community network. This section constitutes a 'supporting service', that is, an optional service that contributes to differentiate our offer from the service being offered at other universities. In particular, UOC students give positive credit to "the possibility of interact with students from all over Spain and Latin-America, who are professionals working on jobs similar to mine", and also to "the chance of making friends and working together in the learning process, performing online collaborative learning". Finally, we have to consider the fees and compensation section. This section is considered by Zeithaml et al. (2004) as being particularly relevant when online consumers do not receive the expected service. In this section, only negative incidents were recorded (about 3% of the total number of incidents). In fact, some students perceived the courses as "expensive" and stated that they did not receive any refunds or compensations for missing or underperformed services.

6. Lessons learned and recommendations to UOC managers

Figure 4 summarizes the data in Table 1 and presents it in a more visual format. From both sources, and according to the previous discussion of results, we can establish the following recommendations for UOC managers. Notice that most of these suggestions could probably be extended to other universities worldwide offering online courses and degrees:

- First of all, total quality management in a university implies to have a holistic view of the service being offered, which includes not only the learning process section but also other dimensions. Nevertheless, the learning process is considered by students as the main quality dimension, since it constitutes the *raison d'être* of the service being offered.
- Regarding the learning process, students give special attention to aspects such as: (a) the guidance and support received by instructors, (b) the assessment process, (c) helpfulness of the responses given by instructors to their requests, (c) associated response times, and (e) balanced workload and practical utility of the proposed homework activities. Therefore, these topics must

be carefully considered by the university and, in the case of our study, data seems to indicate that UOC students are generally satisfied with them. However, it becomes necessary to improve the feedback that our students receive from their instructors: students request a more personalized and complete feedback for each learning activity and not just a general feedback –as it is currently the case in most courses. Regarding the essential service, it is also important to highlight the section related to academic materials and resources. In this sense, the study results reinforce the idea that both materials and academic resources must be well-written, updated and especially suitable for being used in distance-education. Also, the library performance must be efficient and it must offer resources oriented to facilitate the online learning process.

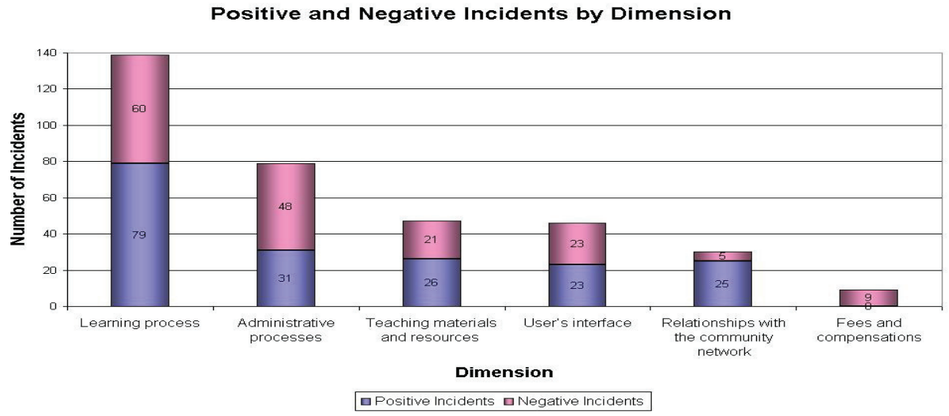

Figure 4: A graphical representation of the number of incidents by section or dimension

- The section regarding administrative processes is the only one that shows more negative than positive critical incidents. Therefore, it is a section that requires priority attention. It is convenient not to forget that this section refers to services that are fully necessary for the correct development of the core service. Some categories need improvement in this section: responses from administrative staff should be more accurate, some administrative processes should be simplified and more transparent (that is, less bureaucratic), and handling and shipping of administrative documentations should be more efficient. A positive aspect of this section is the courtesy employed by administrative staff in their responses to students' requirements.
- Regarding the user's interface section, we can see that there are as much positive as negative incidents. Among the positive incidents, we can highlight the facility to browse the UOC Virtual Campus. Among the negative incidents, we can cite the reliability and connectivity problems that some students have suffered when accessing this Virtual Campus, especially at the beginning of each semester.
- Another positive aspect, from the students' point of view, is the existence of an online learning community that provides support to the e-learning process and enriches it. This, in turn, contributes to reduce the risk of abandonment or drop-out and, at the same time, favours the creation of a real university community.
- Finally, university's managers should work on the fees and compensation dimension, so that students do not perceive the service being received as an expensive one and, moreover, they can be compensated whenever any of the services they have paid for does not perform as well as expected.

7. Conclusions

This paper shows how students perceive online higher-education services and which quality sections or dimensions they consider important in their evaluation. The study applies a holistic conception of service quality, considering not only the core service (the learning process) but also the auxiliary administrative and backup services as well. Furthermore, based on the specific critical incidents reported by students, we have established some recommendations for university managers. On the

one hand, they should maintain and strengthen those aspects which have been referred to as positive critical incidents by students and, on the other hand, they should improve the quality of service from those reported as negative critical incidents. These actions will help to significantly improve the overall quality of service perceived by students and, consequently, students' satisfaction with the services offered by the university. The results obtained are not only aimed at clarifying the determinants of perceived service quality in online higher education, but also show the advantages of the Critical Incident Technique over other exploratory inductive methods, particularly when research is conducted in online environments, as is the case analyzed in this article. This technique has been widely used to assess the underlying sources of satisfaction and dissatisfaction of consumers of services (Bitner *et al.*, 1990; Edvardsoon, 1988; 2001), but as far as we know it has never been applied before in the context of e-services (Sweeney and Lapp, 2004). We think that the use of this technique in online environments offers clear advantages over other qualitative techniques. For instance, organization of discussion groups is not easy to manage since students enrolled on online programs rarely meet face-to-face. Additionally, online students usually combine their courses with their professional activity, which do not give them too much free time to participate in discussion groups or face-to-face interviews.

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A Quality Framework for Continuous Improvement of e-Learning: The e-Learning Maturity Model

Stephen Marshall

Abstract

The E-Learning Maturity Model (eMM) is a quality improvement framework designed to help institutional leaders assess their institution's e-learning maturity. This paper reviews the eMM, drawing on examples of assessments conducted in New Zealand, Australia, the UK and the USA to show how it helps institutional leaders assess and compare their institution's capability to sustainably develop, deploy and support e-learning.

Résumé

Le modèle de maturité pour l'apprentissage en ligne (E-Learning Maturity Model (eMM)) est un cadre de référence sur l'amélioration de la qualité qui est conçu pour aider les leaders institutionnels à évaluer la maturité de leur établissement en lien avec l'apprentissage en ligne. Cet article passe en revue le eMM, en tirant des exemples d'évaluations qui ont été menées en Nouvelle-Zélande, en Australie, au Royaume-Uni et aux États-Unis afin de montrer comment cela aide les leaders institutionnels à évaluer et à comparer la capacité de leur établissement à développer de façon durable, à déployer et à soutenir l'apprentissage en ligne.

Introduction

Investment in e-learning by educational institutions has grown rapidly, driven at least in part by the expectation that increased use of technology will improve the quality and flexibility of learning (Bush 1945; Cunningham et al. 2000; Bates 2001; Cuban 2001; DfES 2003; Oppenheimer 2003) combined with a changing focus on learners rather than teachers and institutions (Oblinger & Maruyama 1996; Buckley 2002; Laurillard 2002). In a recent Sloan survey (Allen & Seaman, 2006) approximately 60% of US college Chief Academic Officers felt that e-learning was "critical to the long-term strategy of their institution."

This investment has been supported by the widespread adoption of Learning Management Systems (Zemsky & Massy, 2004) as well as the computerization of other key administrative functions (Hawkins & Rudy, 2006, p. 52) and the investment of internal and external funding on

e-learning project work (Alexander 1999, Alexander & McKenzie 1998). There has been a growing recognition that a mature and integrated institutional infrastructure is needed to ensure reliable and cost-effective provision of e-learning opportunities to students (Reid, 1999; Holt et al., 2001). Whether significant improvements in the quality of the student experience have been achieved remains, however, unclear (Conole, 2000; Kenny, 2001; Radloff, 2001; Taylor, 2001; GAO 2003; Zemsky & Massy, 2004).

Institutional leadership must consider the implications for e-learning of resource utilization (Karelis 1999), sustainability (Strauss 2002; Young 2002), scalability and reusability (Bain 1999; IEEE 2002; Boyle 2003) and management (Laurillard 1997; Reid 1999). There is a need for leadership, guidance and vision in implementing e-learning that delivers real educational value to students while also being sustainable for the institution in the long term (Strauss, 2002).

Failures such as that of the UK e-University (Garrett, 2004) and the US Open University (Meyer, 2006) illustrate the challenges that face organizations depending on technology for the delivery of programmes. While the large scale educational benefits of e-learning remain difficult to demonstrate, the use of IT systems for business and administrative activities has become mainstream, and even strategically irrelevant as differentiators between organizations (Carr, 2003).

The need to ensure that the organisational aspects of e-learning are supported as well as the pedagogical and technological is now being recognised (Ryan et al. 2000; Bates 2001) and this includes an understanding of the wider, systems context within which e-learning is situated (Laurillard 1997, 1999; Ison 1999) and the need for leadership, strategic direction and collaboration within an organization (Hanna 1998; Reid, 1999). Woodill and Pasian's (2006) review of the management of e-learning projects demonstrates the limited extent to which formal project management tools and systems are currently evident.

In essence, a development of organisational maturity is needed for institutions to benefit from their investment in e-learning. Organizational maturity captures the extent to which activities supporting the core business are explicit, understood, monitored and improved in a systemic way by the organization. Organizational maturity in the context of e-learning projects requires a combination of capabilities. As well as a clear understanding of the pedagogical aspects, project teams must be able to design and develop resources and tools, provide a reliable and robust infrastructure to deploy those resources and tools, support staff and students using them, and finally place their efforts within a strategically driven environment of continuous improvement. While individual staff may be enthusiastic and skilled, the ability of an

institution to support and develop this wider set of capabilities is key to the ongoing sustainability of their work. In the context of the eMM, institutions that have greater organization maturity in e-learning are described as having greater capability (see below).

Laurillard (1997) has noted that the challenge in stimulating the effective use of e-learning resources and approaches beyond early adopters is to identify the limitations of current practices and consequently how strength in e-learning capability can be incrementally improved. Systematic and incremental improvement must encompass academic, administrative and technological aspects (Jones, 2003) combined with careful integration into the strategies and culture of the institution (Remeyni et al., 1997). As noted by Fullan:

> The answer to large-scale reform is not to try to emulate the characteristics of the minority who are getting somewhere under present conditions … Rather, we must change existing conditions so that it is normal and possible for a majority of people to move forward (Fullan 2001, p. 268)

The rapidly evolving nature of the technologies used for e-learning is an additional challenge. Technologies that are useful today are likely to be supplanted or significantly modified in a very short timeframe and new technologies are constantly being introduced in ways that redefine the opportunities available. This constant flux requires flexibility and an openness to change if institutions are to be responsive to the potential opportunities (Hamel & Välikangas, 2003). Institutions need an environment where the processes used to design, deploy and sustain e-learning are robust and effective, rather than ad-hoc and dependent on the energies and skills of particular individuals.

This challenge is not unique to e-learning and has similarly been encountered in the wider field of software engineering. Gibbs (1994) described the activities of those creating software in the late eighties and early nineties as "They have no formal process, no measurements of what they do and no way of knowing when they are on the wrong track or off the track altogether." This criticism could easily be made of the e-learning activities undertaken in many educational institutions today.

Process Maturity Models

One of the ways that the problem of improving the quality of software development was addressed was through the use of process benchmarking. Rather than focusing on particular technologies and measures, process benchmarking examines the quality and effectiveness of the systems and processes used to select, develop, deploy, support, maintain and replace technologies (Humphrey 1994).

In the field of software engineering, the Capability Maturity Model (CMM, Paulk et al. 1993) was developed to provide a framework for process benchmarking. The CMM proposed that organizations engaged in software development moved through five levels of "Maturity" in their process capabilities (Paulk et al. 1993). The CMM has been very successful in stimulating improvements in software development (SEI, 2008) and transfer of good practice between projects (Herbsleb et al. 1994; Lawlis et al. 1995). This success has seen a general adoption of the term 'maturity' to describe organisational effectiveness and a proliferation of maturity models in other domains (Copeland, 2003).

Creation and Application of an e-Learning Maturity Model

An educational version of the CMM, or e-learning Maturity Model (eMM), potentially has a number of benefits that were identified at its inception (Marshall and Mitchell, 2002) and which are evident to others working in the field (Griffith et al., 1997; Kirkpatrick, 2003; Underwood and Dillon, 2005):

- Firstly, an eMM could provide a road map for higher education institutions looking to improve their e-learning processes. It could provide a clear model to guide the ongoing development of institutional resources and enhancement of support processes.
- Support for institutional planning can be enhanced by the ability of an institution or smaller organizational unit to benchmark its current e-learning capability so as to identify and prioritise necessary improvements to its current processes. By focusing on key organisational processes an eMM allows for different technical platforms, management models, educational cultures and pedagogical beliefs.
- The benchmarking information provided through an eMM can aid inter- and intra-institutional collaboration by allowing entities to identify areas in which improvements may produce the most immediate value as well as establishing a framework for collaboration on future initiatives.
- As well as benchmarking, an eMM can also assist with organizational change by providing managers, academics and other practitioners with the necessary means to encourage greater institutional engagement with e-learning. An eMM can also provide University management with the framework necessary to communicate and guide long term institutional e-learning planning and change projects.

Perhaps most importantly, like the CMM, an eMM can form the basis for an ongoing discussion within the e-learning community with a view to identifying the key processes and practices necessary for achieving sustainable and robust improvements in the quality of e-learning experienced by students.

International application of the eMM since its inception has seen many of these benefits realised and acknowledged publicly. Sector wide benefits are evident in the projects conducted in the UK (JISC, 2009; Sero, 2007) and New Zealand (Marshall, 2006a; Neal & Marshall, 2008) and in the use of eMM information to frame consideration of specific aspects of e-learning within sectors (Moore, 2005; Choat, 2006) including professional development of staff (Mansvelt et al., 2009; Capelli & Smithies, 2008). Individual institution's analysis of their capability (Petrova & Sinclair, 2005; University of London, 2008) is also matched by disciplinary specific activities (Lutteroth et al. 2007).

Key Concepts of the eMM

The following pages contain an abbreviated description of the eMM, further information can be found in Marshall (2006b) and on the eMM website: http://www.utdc.vuw.ac.nz/research/emm/

Capability

The most important concept embedded in the eMM is that of Capability, as this is what the model measures and it is designed to analyse and improve. Capability in the eMM builds on the more general concept of organizational maturity and incorporates the ability of an institution to ensure that e-learning design, development and deployment is meeting the needs of the students, staff and institution. Critically, capability includes the ability of an institution to sustain e-learning delivery and the support of learning and teaching as demand grows and staff change. Capability is not an assessment of the skills or performance of individual staff or students, but rather a synergistic measure of the coherence and strength of the environment provided by the organization they work within.

A more capable organization, under the eMM, has coherent systems that address each of the key e-learning processes (see following), it monitors whether these processes are delivering the desired outcomes (in measures it defines for itself), helps staff and students learn and engage with the process activities and deliverables, and systematically improves process to achieve pre-defined improvements.

A less capable institution engages in e-learning in an ad-hoc manner, with disconnected initiatives depending on the skills of individual staff,

duplication due to a lack of knowledge of the work of others, and improvement by chance or personal pride. Successful initiatives are lost as staff change and managers lack information on the outcomes experienced by students and staff.

Capability is not just a function of whether the key processes are addressed. It is a summary of activities assessed over five dimensions that capture the organisational lifecycle associated with each key process.

Dimensions of Capability

Technology adoption models commonly present a hierarchical perspective of technology use by organizations. Models such as that proposed by Taylor (2001), Monson (2005) and the original CMM are designed and used in the presumption that technology use grows in complexity and effectiveness in an essentially linear, or progressive manner. The current version of the eMM, in contrast, has adopted the concept of dimensions to describe capability in each of the processes (Figure 1). Based on the original CMM levels, the five dimensions (Delivery, Planning, Definition, Management and Optimization) describe capability in a holistic and synergistic way.

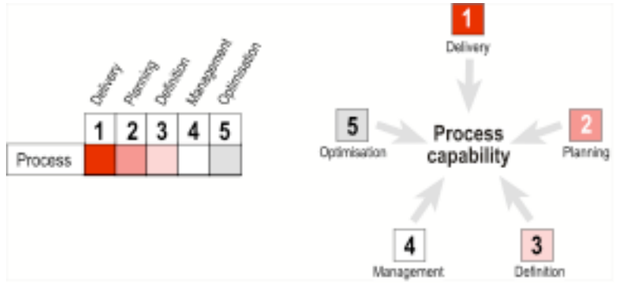

Figure 1: eMM Process Dimensions

The *Delivery* dimension is concerned with the creation and provision of process outcomes. Assessments of this dimension are aimed at determining the extent to which the process is seen to operate within the institution.

The *Planning* dimension assesses the use of predefined objectives and plans in conducting the work of the process. The use of predefined plans potentially makes processes more able to be managed effectively and reproduced if successful.

The *Definition* dimension covers the use of institutionally defined and documented standards, guidelines, templates and policies during the process implementation. An institution operating effectively within this dimension has clearly defined how a given process should be performed. This does not mean that the staff of the institution understands and follows this guidance.

The *Management* dimension is concerned with how the institution manages the process implementation and ensures the quality of the outcomes. Capability within this dimension reflects the measurement and control of process outcomes.

The *Optimization* dimension captures the extent to which an institution is using formal and systematic approaches to improve the activities of the process to achieve pre-defined objectives. Capability of this dimension reflects a culture of continuous improvement.

The *dimensional* approach avoids the model imposing a particular mechanism for building capability, a criticism that has been made of the original CMM (Bach, 1994) it also helps ensure that the objective of improving capability is not replaced with the artificial goal of achieving a higher maturity level. Organizations which have achieved capability in all of the dimensions of the eMM are, by definition, able to use the high level of awareness of their activities that the delivery, planning, definition and management dimensions provide to drive the efficient and flexible change processes measured by the optimization dimension. Indeed, a less capable organization may find themselves focusing on documentation and process over outcomes as a consequence of failing to address the concerns of the optimization dimension of individual processes.

Processes

Recognition of the potential offered by an eMM led to the development of an initial version (Marshall & Mitchell, 2003; 2004) building on the SPICE (Software Process Improvement and Capability Determination) framework (SPICE 1995). The process areas of the first version of the eMM process set was populated using the Seven Principles of Chickering and Gamson (1987) and the Quality on the Line benchmarks (IHEP, 2000) as outlined in Marshall & Mitchell (2004). These heuristics were selected as being widely accepted descriptions of necessary activities for successful e-learning initiatives. Obviously, it would be better to use empirically well-supported benchmark items with a substantial evidence base

proving their utility, however the weaknesses of the current e-learning evidence base (Conole et al., 2004; Mitchel, 2000; Zemsky & Massy, 2004) mean that heuristics must instead be used. A goal of this initial model was to start evaluating the utility of these initial processes so that they could be refined and expanded upon.

The current version of the eMM (Marshall, 2006b) divides the capability of institutions to sustain and deliver e-learning into thirty five processes grouped into five major categories or process areas (Table 1) that indicate a shared concern. It should be noted however that all of the processes are interrelated to some degree, particularly through shared practices and the perspectives of the five dimensions. Each process in the eMM is broken down within each dimension into practices that define how the process outcomes might be achieved by institutions (Figure 2). The practice statements attempt to capture directly measureable activities for each process and dimension. The practices are derived from an extensive review of the literature, international workshops and experience from their application (Marshall 2008).

Figure 2: Relationships between processes, practices and dimensions

Table 1. eMM Version 2.3 Processes (revised from Marshall 2006b)

Learning: Processes that directly impact on pedagogical aspects of e-learning	
L1.	Learning objectives guide the design and implementation of courses.
L2.	Students are provided with mechanisms for interaction with teaching staff and other students.
L3.	Students are provided with e-learning skill development.
L4.	Students are provided with expected staff response times to student communications.
L5.	Students receive feedback on their performance within courses.
L6.	Students are provided with support in developing research and information literacy skills.
L7.	Learning designs and activities actively engage students.
L8.	Assessment is designed to progressively build student competence.
L9.	Student work is subject to specified timetables and deadlines.
L10.	Courses are designed to support diverse learning styles and learner capabilities.

Development: Processes surrounding the creation and maintenance of e-learning resources	
D1.	Teaching staff are provided with design and development support when engaging in e-learning.
D2.	Course development, design and delivery are guided by e-learning procedures and standards.
D3.	An explicit plan links e-learning technology, pedagogy and content used in courses.
D4.	Courses are designed to support disabled students.
D5.	All elements of the physical e-learning infrastructure are reliable, robust and sufficient.
D6.	All elements of the physical e-learning infrastructure are integrated using defined standards.
D7.	E-learning resources are designed and managed to maximise reuse.
Support: Processes surrounding the support and operational management of e-learning	
S1.	Students are provided with technical assistance when engaging in e-learning.
S2.	Students are provided with library facilities when engaging in e-learning.
S3.	Student enquiries, questions and complaints are collected and managed formally.
S4.	Students are provided with personal and learning support services when engaging in e-learning.
S5.	Teaching staff are provided with e-learning pedagogical support and professional development.
S6.	Teaching staff are provided with technical support in using digital information created by students.
Evaluation: Processes surrounding the evaluation and quality control of e-learning through its entire lifecycle	
E1.	Students are able to provide regular feedback on the quality and effectiveness of their e-learning experience.
E2.	Teaching staff are able to provide regular feedback on quality and effectiveness of their e-learning experience.
E3.	Regular reviews of the e-learning aspects of courses are conducted.
Organization: Processes associated with institutional planning and management	
O1.	Formal criteria guide the allocation of resources for e-learning design, development and delivery.
O2.	Institutional learning and teaching policy and strategy explicitly address e-learning.
O3.	E-learning technology decisions are guided by an explicit plan.
O4.	Digital information use is guided by an institutional information integrity plan.
O5.	E-learning initiatives are guided by explicit development plans.

O6.	Students are provided with information on e-learning technologies prior to starting courses.
O7.	Students are provided with information on e-learning pedagogies prior to starting courses.
O8.	Students are provided with administration information prior to starting courses.
O9.	E-learning initiatives are guided by institutional strategies and operational plans.

Application of the eMM

The eMM has been applied in New Zealand across both the university (Marshall, 2006a) and vocational sectors (Neal and Marshall, 2008), the United Kingdom in both the university (Bacsich, 2006; 2008) and vocational sectors (Sero, 2007) and is currently being applied in universities in Australia, the United States (Marshall et al. 2008) and Japan. In total, nearly 80 different institutions have received assessments of their e-learning capability using the eMM.

Figure 3 below presents a small sample of recent university assessments undertaken in New Zealand, Australia, the UK and the USA in order to illustrate how the assessments are visualised and how this information can be used to assess institutional strengths and weaknesses. Each main column in this figure contains the results for a single university with black squares indicating Fully Adequate capability, dark blue Largely Adequate capability, light blue Partially adequate capability, and white no capability. The sub-columns correspond to the five dimensions of the eMM ordered from left to right (as shown in Figure 1). Visually, this 'carpet' of boxes provides a means of reviewing the capabilities of the institutions and identifying patterns of capability within or across the assessed institutions. The small size of the image helps the analysis by encouraging the eye to see the whole pattern, rather than focussing on specific processes. Some institutions are clearly more capable (darker) than others (lighter), consistent with the different priorities individual institutions have placed on e-learning. No institution, however, is entirely black or entirely white; all have areas where they could make significant improvements in their capability.

Looking at the column for a single institution visualised in Figure 3, such as that for University NZ-B, shows that while some groups of processes are relatively strong (such as the block of Learning processes at the top), others (such as the Support and Evaluation processes) are not. This information can start to guide managers and leaders towards areas that may require prioritisation, with the benefit of being visually clear to most audiences when explaining the rationale for focusing on those issues.

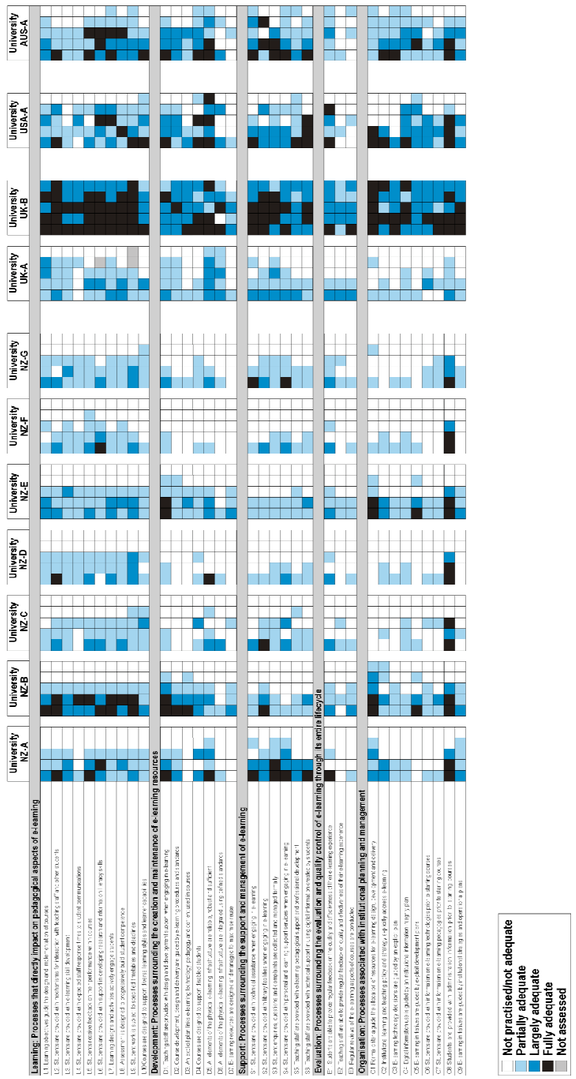

Figure 3: eMM assessments of international universities

Comparing the institutional assessments in Figure 3 reveals a gradient of capability from left to right within each set of results, suggesting stronger capability in the Delivery dimension and weakest in the Optimization dimension. This can be seen more obviously in Figure 4 which sorts the assessments by dimension and groups each institutions assessment for each dimension together. This clearly shows that while capability in the Delivery dimension is generally strong, that in the Management and Optimization dimensions is very much less so. This reflects the observation that many institutions are struggling to monitor and measure their own performance in e-learning (Management dimension) and that a culture of systematic and strategically-led continuous improvement of e-learning is lacking also (Optimization dimension).

The assessment information can also be displayed on an individual process basis to highlight issues that may be common across all institutions. The results for these institutions for Process D7 (E-learning resources are designed and managed to maximise reuse) are shown in Figure 5. This clearly shows that even in institutions that are otherwise very capable (such as university UK-B) this process is not one with strong capability. This is consistent with the observation that despite the obvious attraction of reuse on cost and efficiency grounds, large-scale adoption of reuse approaches such as Reusable Learning Objects has not occurred (Barker et al. 2004). This suggests that the conception of reuse in the literature has not been persuasive and that in reality a number of significant barriers to the creation, storage and reuse of educational materials remain.

Looking at Figure 3, it is also apparent that a band of weak capability runs across most institutions in the Evaluation processes. These are shown individually in Figure 6. Here, it is apparent that most capability is limited to the Delivery dimension of process E1 (Students are able to provide regular feedback on the quality and effectiveness of their e-learning experience). The results for processes E1 and E3 reflects the use of pre-existing student feedback mechanisms, but these have not been changed to reflect the use of technology by institutions. Commonly, institutions are assuming that students will complain if some aspect of their e-learning experience is not adequate, rather than actively ensuring that students are using the systems to best advantage. This is consistent with the overall weak capability noted above in the Management dimension.

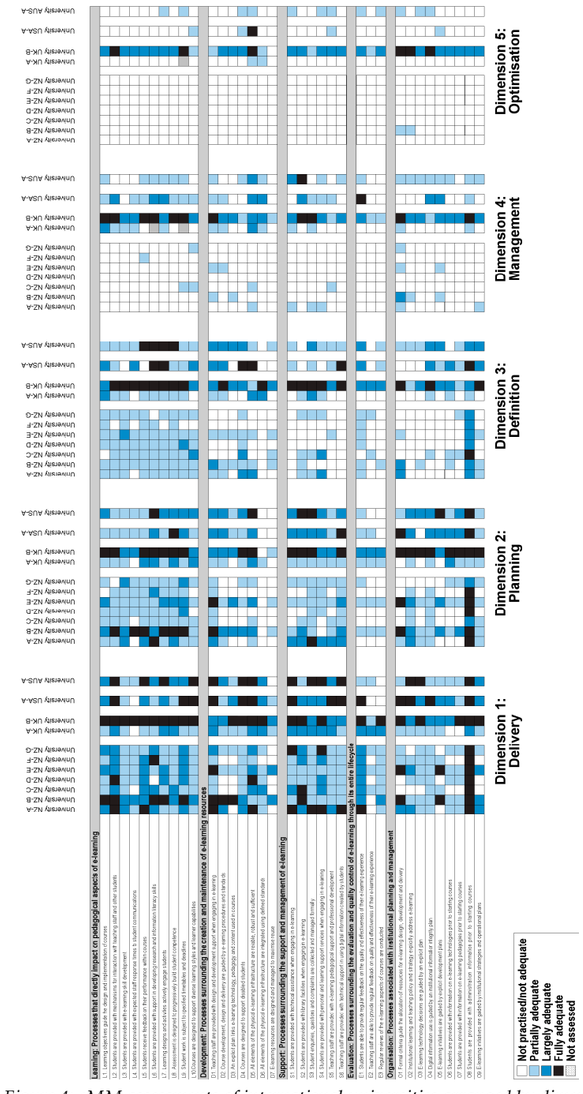

Figure 4: eMM assessments of international universities arranged by dimension

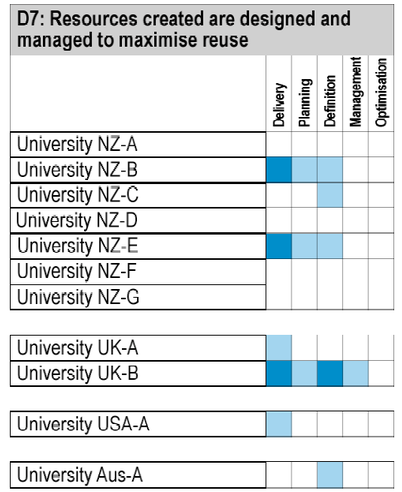

Figure 5: Process D7 capabilities for eleven international universities

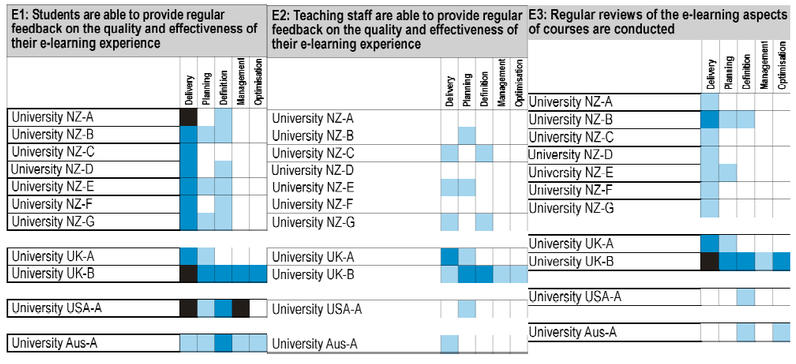

Figure 6: Evaluation process capabilities for eleven international universities

By comparison with E1 and E3, process E2 (Teaching staff are able to provide regular feedback on quality and effectiveness of their e-learning experience) is weaker still (Figure 6). Very little evidence is seen in most institutions of formal and systematic attempts to ensure that staff are able to work effectively in e-learning contexts. This lack of engagement with the need to develop staff skills is also readily apparent in the results for process S5 (Teaching staff are provided with e-learning pedagogical support and professional development) shown in Figure 7. These assessments reflect the common use of optional workshops and webpages without formal assessments of staff skills or any requirement that staff be trained in the use of e-learning.

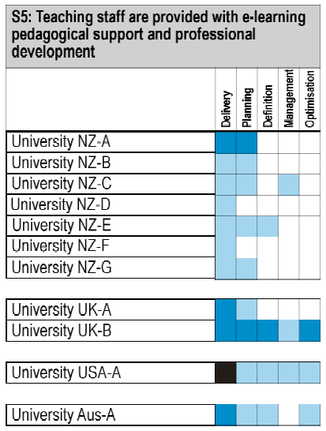

Figure 7: Process S5 capabilities for eleven international universities

Finally, the weak capability in the Organization processes, especially processes O2 (Institutional learning and teaching policy and strategy explicitly address e-learning) and O9 (E-learning initiatives are guided by institutional strategies and operational) shown in Figure 8, and the Management and Optimization dimensions across the entire result set (Figure 4) is a concern. It suggests that the leadership of most of the institutions assessed have yet to define clear directions for e-learning at their institutions. This is consistent with the absence of evidence generally that e-learning has radically changed organisational activities (Weedon et

al. 2004). Keegan et al. (2006) have also noted that significant innovations are commonly linked to external funding and the work of individuals, and that long-term organizational impact and sustainability is questionable.

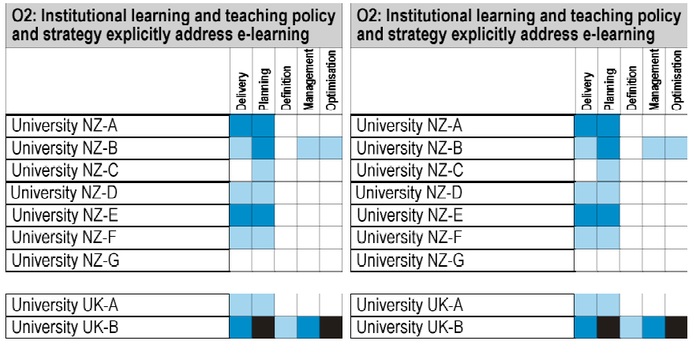

Figure 8: Process O2 and O9 capabilities for eleven international universities

Discussion

As outlined above, the eMM combines key features of benchmarking and capability maturity models with those of observational e-learning quality frameworks in order to create a quality framework for improving organisational e-learning maturity. A variety of observational frameworks exist to explore the quality of e-learning and it is useful to contrast these with the eMM to explain the benefits of the eMM's conception of e-learning maturity.

At the level of the individual innovation there are the well-established models of Rogers (2003) and Moore (1999), which provide explanations of the adoption of innovation by individuals and provide mechanisms for encouraging adoption in the general sense. These are popular as a means of describing why so few innovations are adopted, but more work is needed to turn this type of model into a tool for enhancing e-learning technology use by organizations (Moser, 2007).

Technology based observational models like those proposed by Taylor (2001) and Monson (2005) describe the increasing complexity of technology use as new technologies build upon the old. While any e-learning model must acknowledge technology, building dependencies on specific technologies is risky as it implies that deployment of technology drives success; a recipe for expensive failures. There is also the

issue that technology is changing at an ever greater pace (Kurzweil, 2005) making the maintenance of the currency of such models an ongoing challenge.

Organisationally focussed observation models like CITSCAPE and MIT90 (Weedon et al. 2004, de Freitas, 2006) and many "maturity" models (Neuhauser, 2004) describe the increasing sophistication of organisational engagement with technology supported change and innovation, but in merely describing what is happening they fail to provide a mechanism for supporting and enhancing that change.

In contrast, quality assurance frameworks impose a particular, normally detailed, compliance model upon organisational activities (Chao et al., 2006). Often, they provide a strong description of necessary activities in a particular context, including e-learning, but these models need constant revision to remain relevant. Compliance models also have the problem that the measurement outcomes become potentially more important than the improvement of capability, and, compliance is almost always a backwards, historical, view of an organization, not something that empowers change and growth.

The eMM, in contrast, provides a mechanism for supporting and motivating change. The benchmarking aspects of the model provide a clear picture of an organization's current capabilities and describe the practices that are needed to improve capability. By providing a clear picture of an institution's strengths and weaknesses, combined with a pathway for improving capability, the eMM provides a mechanism for organizations to determine their own priorities, with sufficient flexibility to select technologies and pedagogies that are appropriate to their learners, staff and stakeholder expectations.

In adopting a process driven description of maturity and capability, where capability is defined by specific practices, it is essential that the warning expressed by Hagner (2001, p. 31) be heeded:

> "…the author had envisioned the presentation of a wide range of 'best practices' that would resemble a menu-like opportunity for interested institutions to choose from. This original intent was misguided. … 'cherry-picking' a variety of practices is not recommended. Instead of focusing on 'best practices', a more profitable emphasis should be placed on 'best systems.'"

Taylor (2001) observed that the challenge facing universities engaging in e-learning is not so much about innovation as it is about execution and the need to rapidly evolve to sustain change at the pace technology is changing. A similar observation has been made by Hamel and Valikangas (2003) with their concept of strategic resilience and the need for organizations to constantly reinvent their business models and systems

before circumstances force change. Institutions need to be ready to reinvent themselves and make purposeful and directed changes in response to new technologies and pedagogies in order to become more 'mature', and the eMM is intended to help understand and guide that process, evolving itself as our understanding grows.

Finally, one of the outcomes of the eMM assessments undertaken to date has been the illustration of the reality that all institutions have particular strengths that can serve as a strong foundation for change and which can help others struggling to develop their own capability. E-learning, rather than a threat or special form of learning, is potentially an opportunity for growth, building on the identified strengths of the institution and learning from other institutions, sectors and countries, addressing the weaknesses identified by the eMM capability assessment and developing into a mature e-learning institution.

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Information Quality Framework for e-Learning Systems

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Abstract: Information quality frameworks are developed to measure the quality of information systems, generally from the designers' viewpoint. The recent proliferation of e-services and e-learning particularly raises the need for a new quality framework in the context of e-learning systems. This paper proposes a new information quality framework, with 14 information quality attributes grouped in three quality dimensions: intrinsic, contextual representation and accessibility. This framework could be useful to e-learning systems designers, providers and users as it provides a comprehensive indication of the quality of information in such systems. We report results based on original questionnaire data and factor analysis supporting our conclusions.

Keywords: E-learning; Information quality; Information systems; quality frameworks.

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1. Introduction

Today quality is considered a crucial issue for education in general, and for e-learning in particular. Currently there are two recognized challenges in e-learning: the demand for overall interoperability and the request for high quality. Moreover, quality cannot be expressed and set by a simple definition, since in itself quality is a very abstract notion. The specified context and the perspectives of users need to be taken into account when defining quality in e-learning. It is also essential to classify suitable criteria to address quality (Stracke, 2006).

In the literature, there is a wide interest in information quality provided by information systems in general. However taking into account that quality on the web is a complex concept and its measurement is expected to be multidimensional in nature (Aladwani & Palvia, 2002), the prime issue in evaluating the quality of any information system is identifying the criteria by which the quality is determined (Buyukozkan, Ruan, & Feyzioglu, 2007). The criteria are a result of the multidimensional and interdependent nature of quality in information systems, and are dependent on the objectives and the context of the system.

This paper is part of a wider research project aiming to define metrics to determine the quality of the content provided by distributed learning materials, for integrating intelligent agent technologies as a means of gathering information for quality evaluation.

This paper focuses on concepts of information quality in the context of e-learning systems, particularly on identifying the key dimensions for information quality from the users' perspective in order to build a quality framework to measure the quality of the content provided by e-learning systems. It is essential to identify quality dimensions accurately as they provide the building blocks for further research into the quality of e-learning information systems in general. Great attention has been given to ensure the accuracy of the diminutions defined in this paper. In our study, Wang & Strong's data quality framework (Wang & Strong, 1996) was extended and used as the reference point owing to its popularity and acceptance by the information systems quality community.

The rest of the paper is organized as follows. The next section reconsiders the meaning of e-learning and its definition including the concept of quality in e-learning systems. Section three reviews previous research related to information systems quality frameworks and proposes the first draft of the new framework. In section 4, we discuss our work to collect learners' opinion to identify information quality characteristics in e-learning systems and the preliminary results. Data analysis and the revised framework format are presented in sections 5 and 6 respectively, followed by the conclusion and future work in the final section.

2. E-learning

The term e-learning is used in literature and commercial applications to describe many fields such as online learning, web-based training, distance learning, distributed learning, virtual learning, or technology-based training. During the last decade, e-learning was defined in literature in different ways. In general, most definitions for e-learning are used to express the exploitation of the technologies which can be used to deliver learning (or learning materials) in an electronic format, most likely via the internet (Gerhard & Mayr, 2002). Within the same line of defining e-learning as the delivery of the content through the technical channels, Paulsen more generally describes online learning as "the use of a computer network to present or distribute some educational content" (Paulsen, 2002). Psaromiligkos and Retalis consider e-learning systems as those which utilize the internet as a delivery medium for static learning resources, such as instructional files, or as an interface into interactive content (Psaromiligkos & Retalis, 2003).

The previous definitions look at e-learning in general. In more detail, e-learning can be seen in the form of courses or in the form of modules [separate parts of course's objects] and smaller learning materials. In addition, e-learning can include synchronous or asynchronous interaction.

Considering that there are two main types of e-learning: asynchronous and synchronous, depending on the interaction between learner and teacher, we will now discuss these in more detail. Synchronous e-learning environments require tutors and learners or the online classmates to be online at the same time, where live interactions take place between them. However, the focus of our research will be on the case where students are logging into and using the system independently of other students and staff members. This fits firmly into the general definition of the asynchronous e-learning environment. In this context, Doherty describes an Asynchronous Learning Network [ALN] as a variety of e-learning systems which distribute learning materials and concepts in one direction at a time (Doherty, 1998). Moreover, Spencer and Hiltz express ALN as a place where learners can interact with learning materials, tutors and other learner/s through the internet at different times and from different places (Spencer & Hiltz, 2001).

The position adopted in this research is that e-learning covers the technology used to distribute the learning materials, the quality of these materials, and the interaction with learners. We adopt in the definition of e-learning used in this paper these dimensions as described by the European Commission in (Gerhard & Mayr, 2002 p.2):

> "*the use of new multimedia technologies and the internet to improve the quality of learning by facilitating access to resources and services as well as remote exchange and collaborations*"

2.1. The concept of quality in e-learning systems

The definition of e-learning adopted in this research represents three fundamental dimensions: technology, access and quality. However, the focus in our study will be on quality, which is considered a crucial issue for education in general, and for e-learning in particular. Currently there are two recognized challenges in e-learning: the demand for overall interoperability and the request for [high] quality. Moreover, quality cannot be expressed and set by a simple definition, since in itself quality is a very abstract notion. The specified context and the perspectives of users need to be taken into account when defining quality in e-learning. It is also essential to classify suitable criteria to address this quality (Stracke, 2006).

Although it is important to set standards for information quality, this is a difficult and complex issue because there is no formal definition of information quality, as quality is dependent on the criteria applied to it. Furthermore, it is dependent on the targets, the environment and from which viewpoint we look at the information quality, that is, from the provider or the consumer perspective.

This section of the paper will discuss concepts of quality in e-learning generally. Despite efforts to reach a comprehensive, universal definition of quality in e-learning, there is still a fundamental ambiguity surrounding it and we will approach this further in the paper's conclusions.

One position is to consider quality as an evaluation of excellence, a stance that is primarily adopted by universities and education institutions. For example, in universities, quality teaching and learning are promoted as the top priority, giving less attention to criteria or measurements regarding teaching input into courses, the learning outcomes, and the interactivity with the system (Crisp, 2002). Another trend is to consider the improvement in quality, by moving beyond the set of conceptions in the direction of flexible processes of negotiation which needs a very high level of quality capability from those involved (Ehlers, Goertz, Hildebrandt, & Pawlowski, 2005).

Quality can be viewed and considered from different aspects. In this context the SunTrust Equitable report (Close, Humphreys, & Ruttenbur, 2000) illustrates what they perceive to be the value chain in e-learning in the form of a pyramid. Content is the most critical factor of e-learning as it forms the base of the value pyramid. In fact, to be able to use the internet as a tool to improve learning, the content should not distract learners, but increase their interest for learning. Learning tools and enablers are also important in the learning procedure. In reality, providers of learning platforms and knowledge management systems are key factors in the successful delivery of content. The providers need infrastructure to deliver learning content. Moreover, learning service providers [LSP] are the distribution channels for content providers. One of the challenges which face these knowledge hubs and LSPs is to ensure that the learners are receiving fresh content. Companies focused on educational e-tailing [electronic retailing] are completing the value pyramid of e-learning.

From their e-learning value pyramid it can be observed that content is the most critical component of learning through the internet. In a similar manner, we will find that the measurement of the quality of content delivered by e-learning is the most important criteria and the most influential in the overall level of learning quality.

3. Information quality frameworks

Although it is important to set standards for information quality, it is a difficult and complex issue particularly in the area of information systems because there is no formal definition of information quality, as quality is dependent on the criteria applied to it. Furthermore, it is dependent on the targets, the environment and from which viewpoint we look at the information quality, that is, from the provider or the consumer perspective. Moreover information quality is both a task-dependent and a subjective concept; Juran summarises these aspects of quality in his quality definition as "fitness for use" (Juran., 1974).

However, it is common to define information quality on the internet by identifying the main dimensions of the quality. For that purpose information quality frameworks are widely used to identify the important quality dimensions as described by Porter (Porter, 1991).

During the last years, much work has been done [as will be discussed later in this section] to build quality frameworks for information quality dimensions. In the past, research in information quality frameworks focused on data quality, but due to the recent development of internet technologies, information systems today are providing users information, not only data. Therefore, research attention shifted to focus on information quality frameworks. However, still in some studies the term "information quality" is interchangeable with "data quality". Discussion on this issue is outside the scope of this paper, but we will return to it in the future work.

This part of the paper focuses on the Wang & Strong's data quality framework and reviews quality models, which were published since. We also present our proposed framework, which will be a result of the expansion of the original model to support identifying the key dimensions for information quality in e-learning systems.

3.1. Wang and Strong data quality framework

Wang & Strong's data quality framework, one of the most comprehensive, popular, remarkable and cited data quality framework, was established by Richard Wang and Diana Strong in 1996 (Wang & Strong, 1996). Their framework was designed empirically by asking users to give their viewpoint about the relevance of the information quality dimensions to capture the most important aspects of data quality to the data consumer. Lately, several quality management projects in business and government have successfully used this framework. Their hierarchical conceptual framework of data quality is shown in Figure 1[1].

In their framework, Wang and Strong classified quality dimensions into four groups (Wang & Strong, 1996):

- *Intrinsic data quality:* refers to the quality dimensions originated from the data in its own. This aspect of quality is independent of the user's perspective and context.

[1] Reproduced from (Wang & Strong, 1996) by kind permission of the author.

- *Contextual data quality:* focuses on the aspect of information quality within the context of the task at hand. In this group, the quality dimensions are subjective preferences of the user. Contrary to the first group, data quality dimensions cannot be assessed without considering the users viewpoint about their use of provided information.
- *Representational data quality:* is related to the representation of information within the systems.
- *Accessibility data quality:* refers to the quality aspects concerned into accessing distributed information.

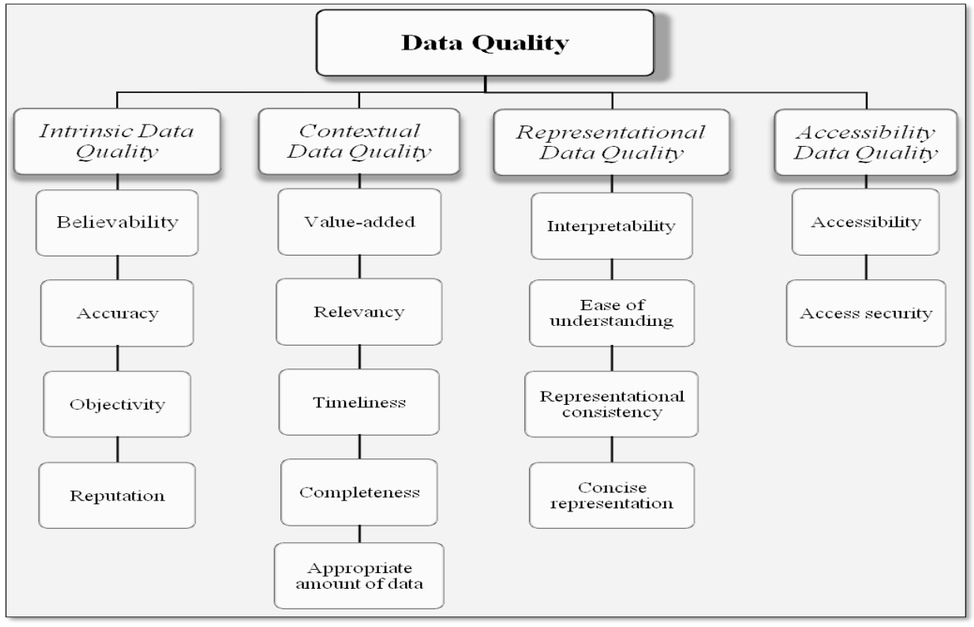

Figure 1. *Wang & Strong's data quality framework*

Although their quality model will provide a good basis for our research to measure information quality in e-learning systems along the dimensions of this framework, it should be extended to include any undiscovered quality dimensions that occurred in the lately published research in the area of the quality in information systems.

3.2. Information quality in recent years

After Wang & Strong's data quality framework, diverse research efforts were spent in order to identify information quality dimensions in different contexts as shown in Table 1.

We extended Wang & Strong's data quality framework by examining seventeen frameworks within the recently published literature. In general, we found that there are nineteen quality dimensions permanently used in most of the frameworks. Fifteen of them are already used in Wang & Strong framework. Table 1 summarises the occurrence of these dimensions within the examined frameworks. Table 2 gives the frequency of the appearances for every dimension along the examined frameworks.

These dimensions are grouped into four categories as defined within the Wang & Strong's framework. The nineteen initial quality dimensions, which were identified in the examined frameworks, will be used as an extended framework and therefore as a fundamental base to discover the important quality dimensions from the users' perspective in the context of e-learning systems.

Table 1. Comparison between the emergences of quality dimensions in different information quality framework (part 1)

Information quality							
Quality factors	**Quality dimensions**	Gertz & Managing 1996 (Gertz, 1996)	Redman 1996 (Redman, 1996)	Zeist & Hendriks 1996 (Zeist & Hendriks, 1996)	Jarke & Vassiliou 1997 (Jarke & Vassiliou, 1997)	Chen et all 1998 (Chen, Zhu, & Wang, 1998)	Alexander & Tate 1999 (Alexander & Tate, 1999)
Intrinsic dimensions	Accuracy	√	√	√	√	√	√
	Believability				√		√
	Consistency				√		
	Objectivity		√				√
	Reputation						√
Contextual dimensions	Appropriate amount of data	√	√	√		√	√
	Completeness	√	√		√	√	
	Relevancy		√	√	√	√	√
	Timeliness	√		√	√	√	√
	Value-added						
	Verifiability		√				
Representational dimensions	Concise representation		√				
	Ease of understanding			√			
	Interpretability		√		√		
	Representational consistency		√		√		√
Accessibility dimensions	Accessibility			√			√
	Access Security			√	√		
	Availability	√	√		√		
	Response time				√	√	

Table 1. Comparison between the emergences of quality dimensions in different information quality framework (Part 2)

Information quality frameworks									
Katerattanakul & Siau 1999 (Katerattanakul & Siau, 1999)	Shanks & Corbitt 1999 (Shanks & Corbitt, 1999)	Dedeke 2000 (Dedeke, 2000)	Zhu & Gauch 2000 (Zhu & Gauch, 2000)	Leung 2001 (Leung, 2001)	Eppler & Muenzenmayer 2002 (Eppler & Muenzenmayer, 2002)	Kahn et all 2002 (Kahn, Strong, & Wang, 2002)	Klein 2002 (Klein, 2002)	Mecella 2002 (Mecella et al., 2002)	Liu & Han 2005 (Liu & Han, 2005)	Besiki et all 2007 (Besiki, Gasser, Twidale, & Smith, 2007)
√	√	√		√	√		√	√	√	√
√	√		√		√	√				
	√	√			√	√		√	√	√
	√		√	√	√	√	√			
√	√								√	
		√		√	√	√	√			
	√	√		√	√	√	√	√	√	√
√		√	√	√			√		√	√
	√	√	√	√	√	√	√	√	√	
					√					√
					√					
		√			√	√				
√					√	√			√	
√	√	√	√	√	√	√			√	√
				√	√					√
		√	√	√	√	√			√	

3.3. The proposal for the extended framework

We propose to update Wang and Strong's data quality framework initially comprising another four quality dimensions. Therefore, the extending quality framework consists of four quality factors and nineteen quality dimensions as shown in Figure 2.

Table 2. Dimensions' frequencies in the examined frameworks

Quality dimensions	Frequency
Accuracy	15
Believability	7
Consistency	8
Objectivity	8
Reputation	4
Appropriate amount of data	10
Completeness	13
Relevancy	12
Timeliness	14
Value-added	0
Verifiability	3
Concise representation	2
Ease of understanding	4
Interpretability	2
Representational consistency	7
Accessibility	11
Access Security	5
Availability	3
Response time	8

4. The survey

Although quality frameworks help in the measurement procedure, defining the quality using a framework is not enough because as mentioned before information quality is dependent on the application context. For that reason the identified quality dimensions were arranged in a questionnaire format to determine the users' view of the relative importance of quality dimensions in an e-learning system. This questionnaire[1] seeks to gather the views of end-users about the importance of information quality dimensions in e-learning systems. It also gives an indication about the importance and relevancy of these quality dimensions for the users, which will help in ranking these dimensions in order to develop an information quality framework for quality metrics to measure the quality of information provided by e-learning systems.

This investigation was a cross-section survey performed on a sample chosen from a population of persons involved in academic work and dealing with e-learning systems in a regular basis. Respondents were included both of learners and teachers. The questionnaire was distributed to the respondents via e-mail because of its reduced cost, decrease short transfer time and its convenience for respondents. Surveymethods.com, an online survey software application, was used to create the survey, deploy it via e-mail, and collect and analyze respondent data through its graphical based analysis module. The

[1] The survey can be accessed from www.elearningquality.com

questionnaire was planned to take less than five minutes to complete. The questionnaire consisted of three parts:

Part 1 gives a brief profile of the respondent.

Part 2 addresses the user's attitude and usage of the internet in general and e-learning systems specifically.

Part 3 asks respondents to rank the nineteen quality dimensions in order of their importance.

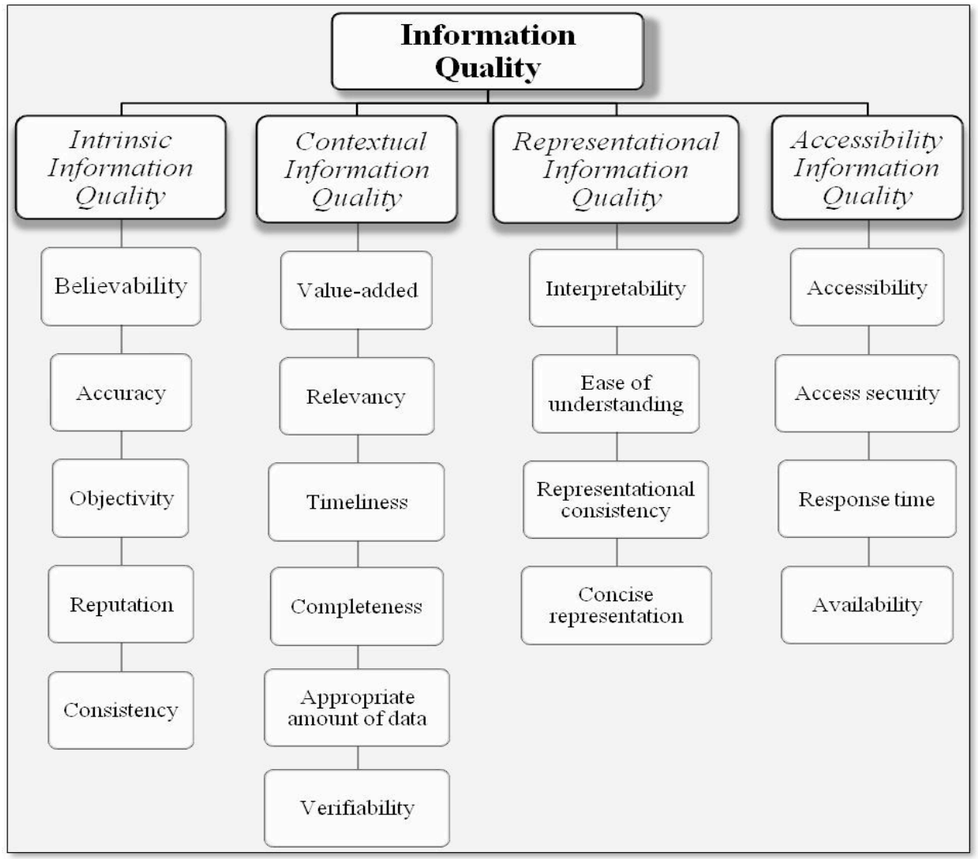

Figure 2. The extended framework

We collected responses from 315 e-learning system users[1], from 24 different countries, 46% of the respondents were from Saudi Arabia, 26% from United Kingdom, 12% from Romania and the rest of the respondents were from the 21 remaining countries. 57% of the participants were females, and 43% were males. All the respondents in the sample were e-learning users from different learning institutes. Of the respondents that contributed, the majority [66%] use e-learning as learners, and 29% as teachers and authors of the learning materials while 5% use e-learning systems for other purposes such as librarians and technicians. In addition, participants are holding various qualifications, 40% were holding Bachelor's degree, 33% have Master's degree, and 20% have PhD while the remaining 7% hold those listed as others.

5. Data analysis

We analyse the collected data from the third part of the questionnaire using SPSS to identify the most important quality dimensions in the area of e-learning systems and to build the final quality framework.

First, we conducted a frequency analysis for each variable to check for major mistakes and missing values. The results for variables frequency analysis in each dimension show that the data is valid and ready to be analysed.

Reliability is the level to which research results would be the same if the investigation was to be repeated with a different sample or at a later date. In this research, the most accepted test of inter-item consistency reliability is the Cronbach's coefficient alpha (L.J. Cronbach, 1951; L.J. Cronbach, 1971). Based on Sekaran reliabilities less than 0.6 are considered to be poor, those in the 0.7 range are acceptable, and those over 0.8 are good (Sekaran, 2000). The closer to 1.0 the better the reliability coefficient is. It is generally agreed that the minimum acceptable value of Cronbach's alpha is 0.70 (Pallant, 2005; Peter, 1979), but this could be reduced to 0.6 for exploratory research (Robinson, Shaver, & Wrightsman, 1991). The Cronbach's alpha values for the dimensions in each quality factor gave an acceptable reliability level with 0.712, 0.735, 0.781, and 0.625 for intrinsic, contextual, representational and accessibility information quality respectively.

Screening the data responding to Churchill's recommendation will increase the reliability levels (Churchill & Gilbert, 1979). So, the collected data was screened by discarding items that showed very small corrected item-total correlations [<0.40]. Because of this test, we delete timeliness and value-added variables from contextual factor, and access security variable from accessibility factor, which leaves only 16 dimensions in the framework. As a result, the reliability coefficient increased to 0.712, 0.748, 0.781, 0.668 for intrinsic, contextual, representational and accessibility factors respectively.

The next stage was conducting a factor analysis procedure with *varimax* rotation to check the dimensionality of the construct. To choose the cut-off value, there is no fixed measure. It depends on the purpose of the study on hand. Haire recommended that item loadings >0.30 are considered significant, >0.40 are more important, and >0.50 are considered very significant (Hair, Tatham, Anderson , & Black, 1998). While the aim of this study is to recognize the most important and significant quality attributes, we decided to use a cut-off point of 0.50 for item loadings and *eigenvalue* of 1.

[1] As recorded on 5th of March 2009

The determinant of the correlation matrix[1] is 0.002, which is greater than the necessary value of 0.00001. As a result, we are confident that multicollinearity will not cause any problems for our data (Field, 2000).

Table 3. KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.879
Bartlett's Test of Sphericity	Approx. Chi-Square	1845.750
	Df	120.000
	Sig.	.000

Table 4: Total Variance Explained

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	6.058	37.865	37.865	6.058	37.865	37.865	3.735	23.343	23.343
2	1.401	8.753	46.619	1.401	8.753	46.619	2.627	16.418	39.762
3	1.188	7.424	54.043	1.188	7.424	54.043	2.285	14.281	54.043
4	.974	6.090	60.133						
5	.879	5.497	65.630						
6	.786	4.914	70.544						
7	.657	4.106	74.650						
8	.598	3.740	78.390						
9	.565	3.530	81.920						
10	.556	3.477	85.397						
11	.532	3.324	88.721						
12	.455	2.843	91.565						
13	.412	2.576	94.141						
14	.366	2.286	96.426						
15	.306	1.911	98.338						
16	.266	1.662	100.000						

Extraction Method: Principal Component Analysis.

The Kaser-Meyer-Oklin [KMO] measure of sampling adequacy and Bartlett's test of sphericity are illustrated in Table 3. The KMO static is a value between 0 and 1. A value close to 1 indicates that patterns of correlation are fairly compact and as a result factor analysis should gives distinct and reliable factors (Field, 2000). Values between 0.5 and 0.7 are average, values between 0.7 and 0.8 are good, values between 0.8 and 0.9

[1] See appendix I

are great and values above 0.9 are excellent (Hutcheson & Sofroniou, 1999). Moreover, the significant value for the Bartlet's test should be less than 0.05 (Field, 2000). In our data, the value is .879, which is in the range of being great and the Bartlett's test is highly significant. Therefore, we are confident that factor analysis is appropriate for our data.

In addition to examining the overall KMO statistic, it is essential to check the diagonal elements of the anti-image correlation matrix[1] [which illustrates the KMO value for individual variables]; as in the overall KMO value these values have to be greater than 0.50 for all variables (Field, 2000). For our data, the values are in the range between [0.828 … 0.934].

Concerning the sample size, Comrey and Lee stated that 300 is a good sample size for factor analysis, 100 is poor while 1000 is excellent (Comrey & Lee, 1992). Since the number of our sample exceeds 300 respondents we should be confident that the sample size is appropriate for this type of analysis.

Table 4 lists the *eigenvalues* associated with each factor before extraction, after extraction and after rotation.

Before extraction, SPSS has identified 16 factors within the data set. SPSS then extracts all factors with *eigenvalues* greater than 1, which leave us with three factors.

From the *scree plot* shown in Fig 3, we can see that the point of inflexion on the curve on three factors which is in conformity with the results shown in Table 4. Thus, the most suitable way is to stick with three factors.

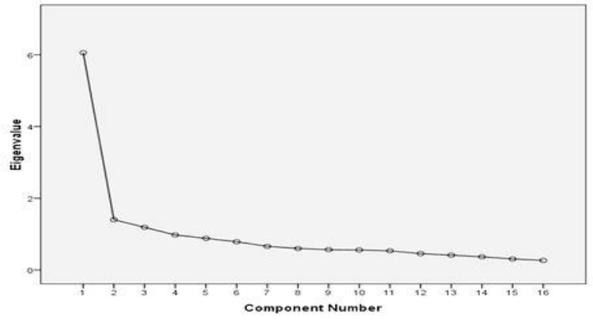

Figure 3. Scree plot

Table 5 shows the rotated component matrix, which is the matrix of the factor loadings for each variable onto each factor. Factors loading less than 0.5 have not been displayed because we asked for these lodgings to be suppressed. As a result, we discarded these suppressed variables, which are Consistency and Interpretability, which leave only 14 variables in total.

Analysis finding shows that there are three information quality factors in e-learning systems not four, as proposed previously. We recognized that contextual and

[1] See appendix II

representational quality factors are measuring the same aspects from e-learning systems users' perspective. Therefore, we propose a new framework, with 14 dimensions of information quality in e-learning systems to measure three quality factors: Intrinsic, Contextual representation and Accessibility information quality.

We then calculated Cronbach's alpha values for the variables in each new factor, which gives a good reliability level with 0.842, 0.697, and 0.665, for Intrinsic, Contextual representation and Accessibility information quality respectively. The new proposed framework is shown in Figure 4.

Table 5. Rotated Component Matrix [a]

Quality attributes	Component		
	1	2	3
Believability			.689
Accuracy			.736
Objectivity			.765
Reputation	.673		
Consistency			
Relevancy		.541	
Completeness	.582		
Amount Of Information	.607		
Verifiability	.695		
Interpretability			
Understandability	.643		
Representational Consistency	.596		
Conciseness	.809		
Accessibility		.667	
Response Time		.623	
Availability		.782	

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Linear regression then was used to predict the factor scores from the variables. correlation coefficient, and can be obtained by squaring the "*part corr*" provided by SPSS "β in the equation bellow". For example for Completeness in the first factor, that is $0.156^2 = 2.434\%$. These statistics will sum to less than 100%. To get them to sum to 100%, we divided each by the sum of all. So we can calculate the relative importance for each variable in the correlated factor we can use the following equation:

$$relative\ importance\ for\ vi = \frac{\beta i^2}{\sum_i \beta i^2} \quad ,\mathrm{i} = 1, \ldots, 14\,,$$

where βi is the partial correlation for the variable vi in the corresponding factor. The same logic was conducted to define the relative importance for each factor in the overall quality.

The zero-order correlations in Appendix3 are the loadings. One could define the relative importance of a variable as the amount by which the explained variance in the factor is reduced if the variable is removed from the regression model. That statistic measure is the squared semi-partial.

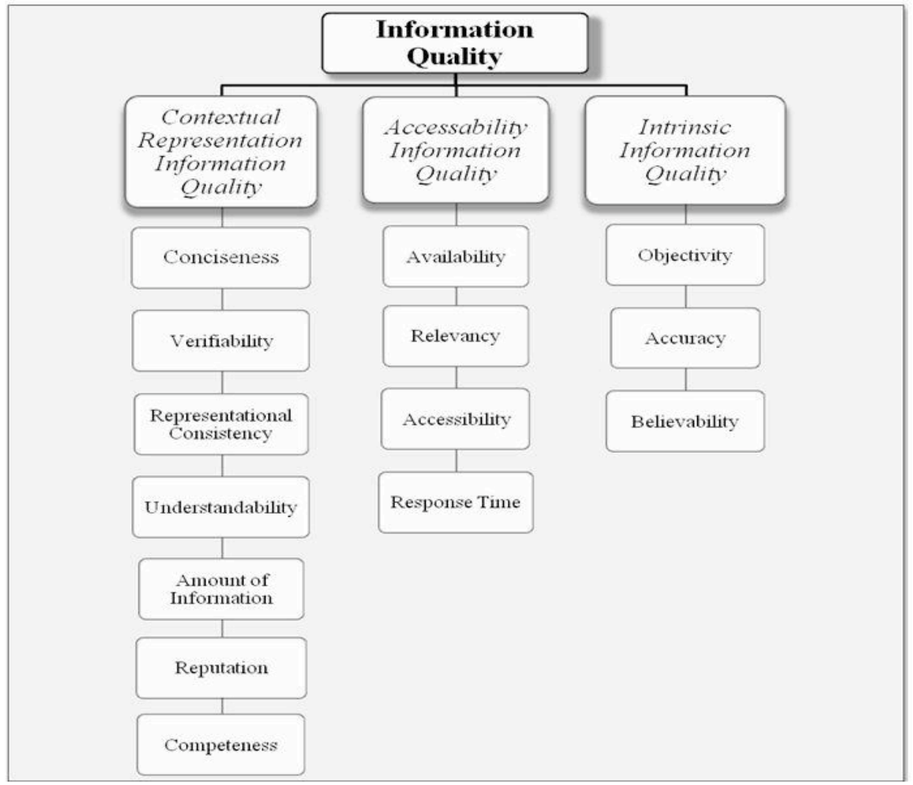

Figure 4. The new proposed framework

6. Revised framework

The revised framework for information quality in e-learning systems after calculating the relative importance for each dimension inside the three quality factors, and the relative

importance for each factor in the overall quality are proposed in Figure 5. The final framework consists of 14 quality dimensions grouped in three quality factors: intrinsic, contextual representation and accessibility. The most important factor is Intrinsic information quality with relative importance score 41.157% of the overall quality while Contextual representation and Accessibility scored 33.851% and 24.992% respectively. Objectivity is the most important dimension in the Intrinsic factor. Reputation scored the highest relative importance within Contextual representation factor. Where Accessibility and Response time have almost the same relative importance within Accessibility factor with the scores 29.693% and 29.888% respectively.

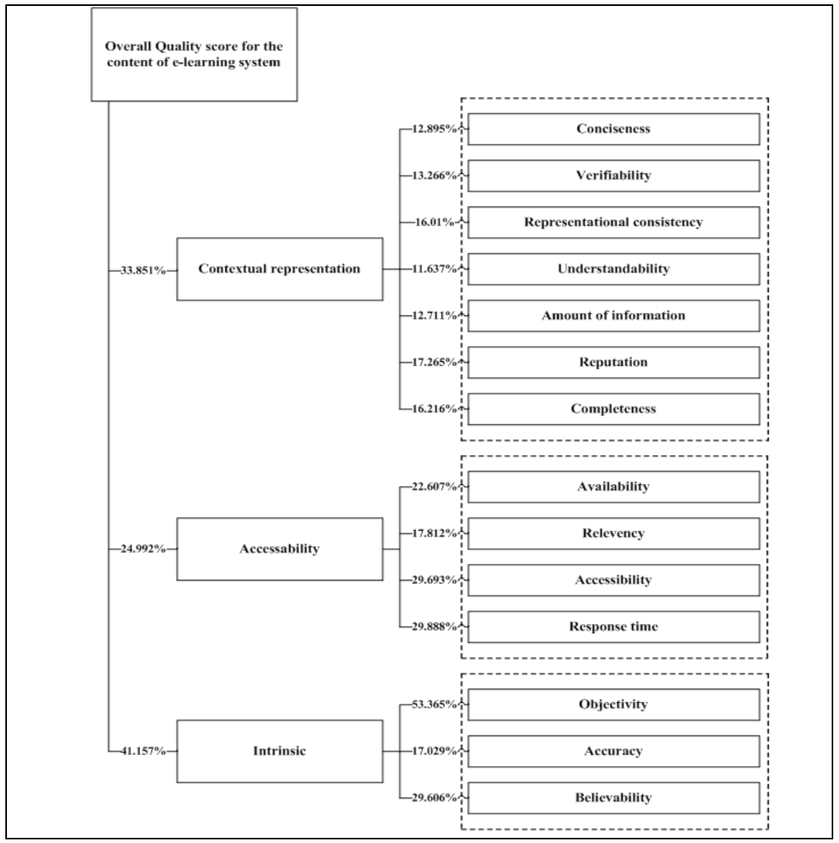

Figure 5. The revised framework

7. Conclusion and future work

Based on original questionnaire data and factor analysis, we proposed a new quality framework to measure the quality of the content provided by e-learning systems. Linear regression was used to calculate the relative importance for each dimension inside the three quality factors, and the relative importance for each factor in the overall quality. This framework could be used to provide a comprehensive indication of information quality in the context of e-learning systems. It could be useful to e-learning systems designers, providers and users as it provides a comprehensive indication of the quality of information in such systems.

As mentioned before, the framework proposed in this paper is a part of a larger research project. The next stage will be the development of a set of quality metrics and an experiment to compute these metrics in chosen e-learning systems. The value calculated for each metric will then be compared with the results from a user satisfaction survey. The research also will focus on taking advantages of software agent technologies in order to automate data collection and evaluation processes.

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Appendix I

Correlation Matrix [a]

		Believability	Accuracy	Reputation	Consistency	Relevancy	Objectivity	Completeness	AmountOfInformation	Verifiability	Interpretability	Understandability	RepresentationalConsistency	Conciseness	Accessibility	ResponseTime	Availability
Correlation	Believability	1.000	.445	.246	.188	.300	.412	.302	.248	.345	.356	.204	.311	.235	.166	.190	.188
	Accuracy	.445	1.000	.255	.367	.369	.442	.304	.212	.234	.353	.320	.274	.204	.210	.308	.225
	Reputation	.246	.255	1.000	.410	.199	.378	.462	.300	.455	.345	.395	.332	.422	.193	.246	.158
	Consistency	.188	.367	.410	1.000	.387	.318	.343	.344	.266	.411	.450	.424	.333	.380	.318	.323
	Relevancy	.300	.369	.199	.387	1.000	.288	.356	.376	.299	.251	.252	.248	.193	.367	.282	.342
	Objectivity	.412	.442	.378	.318	.288	1.000	.247	.290	.285	.253	.239	.249	.144	.169	.238	.122
	Completeness	.302	.304	.462	.343	.356	.247	1.000	.493	.447	.343	.396	.297	.443	.389	.354	.241
	AmountOfInformation	.248	.212	.300	.344	.376	.290	.493	1.000	.587	.416	.388	.319	.456	.390	.237	.280
	Verifiability	.345	.234	.455	.266	.299	.285	.447	.587	1.000	.508	.492	.366	.496	.413	.354	.350
	Interpretability	.356	.353	.345	.411	.251	.253	.343	.416	.508	1.000	.468	.370	.442	.367	.432	.441
	Understandability	.204	.320	.395	.450	.252	.239	.396	.388	.492	.468	1.000	.449	.548	.380	.365	.386
	Representational Consistency	.311	.274	.332	.424	.248	.249	.297	.319	.366	.370	.449	1.000	.557	.293	.318	.254
	Conciseness	.235	.204	.422	.333	.193	.144	.443	.456	.496	.442	.548	.557	1.000	.347	.249	.339
	Accessibility	.166	.210	.193	.380	.367	.169	.389	.390	.413	.367	.380	.293	.347	1.000	.348	.435
	ResponseTime	.190	.308	.246	.318	.282	.238	.354	.237	.354	.432	.365	.318	.249	.348	1.000	.435
	Availability	.188	.225	.158	.323	.342	.122	.241	.280	.350	.441	.386	.254	.339	.435	.435	1.000

a. Determinant = .002

Appendix II

Anti-image Matrix [a]

		Believability	Accuracy	Reputation	Consistency	Relevancy	Objectivity	Completeness	AmountOfInformation	Verifiability	Interpretability	Understandability	RepresentationalConsistency	Conciseness	Accessibility	ResponseTime	Availability
Anti-image Correlation	Believability	**.828[a]**	-.252	.035	.114	-.105	-.231	-.121	.064	-.142	-.170	.100	-.159	.003	.055	.100	-.027
	Accuracy	-.252	**.874[a]**	.038	-.117	-.159	-.237	-.076	.077	.071	-.107	-.114	.005	.015	.035	-.085	.014
	Reputation	.035	.038	**.834[a]**	-.238	.041	-.243	-.270	.152	-.253	-.038	-.039	.002	-.158	.133	.018	.074
	Consistency	.114	-.117	-.238	**.868[a]**	-.171	-.072	.001	-.103	.206	-.148	-.163	-.202	.067	-.148	.000	-.055
	Relevancy	-.105	-.159	.041	-.171	**.890[a]**	-.040	-.109	-.162	-.025	.109	.047	-.029	.092	-.121	-.027	-.169
	Objectivity	-.231	-.237	-.243	-.072	-.040	**.838[a]**	.086	-.152	-.011	.049	-.015	-.035	.129	-.006	-.076	.061
	Completeness	-.121	-.076	-.270	.001	-.109	.086	**.881[a]**	-.247	.010	.065	-.044	.089	-.150	-.152	-.181	.091
	AmountOfInformation	.064	.077	.152	-.103	-.162	-.152	-.247	**.861[a]**	-.357	-.107	.017	.011	-.149	-.043	.109	.027
	Verifiability	-.142	.071	-.253	.206	-.025	-.011	.010	-.357	**.876[a]**	-.160	-.167	-.012	-.070	-.141	-.090	-.039
	Interpretability	-.170	-.107	-.038	-.148	.109	.049	.065	-.107	-.160	**.921[a]**	-.077	.015	-.094	-.029	-.179	-.168
	Understandability	.100	-.114	-.039	-.163	.047	-.015	-.044	.017	-.167	-.077	**.934[a]**	-.091	-.231	-.042	-.054	-.096
	RepresentationalConsistency	-.159	.005	.002	-.202	-.029	-.035	.089	.011	-.012	.015	-.091	**.876[a]**	-.381	-.018	-.140	.074
	Conciseness	.003	.015	-.158	.067	.092	.129	-.150	-.149	-.070	-.094	-.231	-.381	**.865[a]**	-.036	.122	-.120
	Accessibility	.055	.035	.133	-.148	-.121	-.006	-.152	-.043	-.141	-.029	-.042	-.018	-.036	**.919[a]**	-.058	-.194
	ResponseTime	.100	-.085	.018	.000	-.027	-.076	-.181	.109	-.090	-.179	-.054	-.140	.122	-.058	**.881[a]**	-.238
	Availability	-.027	.014	.074	-.055	-.169	.061	.091	.027	-.039	-.168	-.096	.074	-.120	-.194	-.238	**.881[a]**

a. Measures of Sampling Adequacy[MSA]

Appendix III

Coefficients for the first factor [a]

Model		Correlations		
		Zero-order	Partial	Part
1	Believability	.388	.000	.000
	Accuracy	.353	.000	.000
	Objectivity	.368	.000	.000
	Reputation	.672	1.000	.162
	Relevancy	.393	.000	.000
	Completeness	.716	1.000	.157
	Amount Of Information	.708	1.000	.139
	Verifiability	.764	1.000	.142
	Understandability	.714	1.000	.133
	Representational Consistency	.658	1.000	.156
	Conciseness	.777	1.000	.140
	Accessibility	.480	.000	.000
	Response Time	.422	.000	.000
	Availability	.396	.000	.000

a. Dependent Variable: Factor#1

Coefficients for the second factor [a]

Model		Correlations		
		Zero-order	Partial	Part
1	Believability	.284	1.000	.000
	Accuracy	.376	-1.000	.000
	Objectivity	.276	-1.000	.000
	Reputation	.276	1.000	.000
	Relevancy	.647	1.000	.237
	Completeness	.463	-1.000	.000
	Amount Of Information	.438	.987	.000
	Verifiability	.494	-1.000	.000
	Understandability	.486	-.992	.000
	Representational Consistency	.386	.973	.000
	Conciseness	.395	1.000	.000
	Accessibility	.760	1.000	.306
	Response Time	.732	1.000	.307
	Availability	.758	1.000	.267

a. Dependent Variable: Factor#2

Coefficients for the third factor [a]

Model		Correlations		
		Zero-order	Partial	Part
1	Believability	.768	1.000	.327
	Accuracy	.733	1.000	.248
	Objectivity	.849	1.000	.439
	Reputation	.387	.000	.000
	Relevancy	.394	.000	.000
	Completeness	.351	.000	.000
	Amount Of Information	.324	.000	.000
	Verifiability	.370	.000	.000
	Understandability	.316	.000	.000
	Representational Consistency	.347	.000	.000
	Conciseness	.238	.000	.000
	Accessibility	.224	.000	.000
	Response Time	.302	.000	.000
	Availability	.212	.000	.000

a. Dependent Variable: Factor#3

Quality and Growth Implications of Incremental Costing Models for Distance Education Units

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Abstract

The purpose of this article is to explore quality and growth implications emergent from various incremental costing models applied to distance education units. Prior research relative to costing models and three competing costing models useful in the current distance education environment are discussed. Specifically, the simple costing model, unit costing model, and marginal costing model are critically analyzed relative to their quality and growth implications. Finally, the paper will provide rationale suggesting that the marginal costing model represents the most accurate estimation for profitability of distance learning units.

Introduction

A recent nationwide study of distance education (Parsad & Lewis, 2009) found that 66% of 2-year and 4-year institutions now offer online or hybrid courses for their students. One might logically conclude that distance education offerings have certainly hit a "tipping point" and that distance education has a firm foothold in the higher education landscape. This finding is not particularly revealing for members of the higher education community since it would only be a unique traditional institution that would have not at least investigated the feasibility of distance education offerings for their students. While there is a significant range of participation in distance education (limited courses to complete program offerings), many public and private institutions have made forays into this new world of technology application to enhance access to higher education (Annetta, 2004). As more institutions of higher education enter the distance education environment in a significant manner, it is inevitable that costing and profitability estimates become pivotal factors in determining long-term viability (Annetta, 2004; Laaser, 2008).

The process of estimating program costs for traditional on-campus programs has been an important part of the higher education landscape. The inadequacy of these historic models is discussed by the League for Innovation (n.d.), "Many of higher education's costing models were developed in the 1960s and 1970s, when the majority of instruction and curriculum content was written and created by faculty alone for traditional classroom delivery." However, estimates of costs, tuition prices, and program viability for distance education units have not been widely researched (Laaser, 2008). Gordon, He, and Abdous (2009) underscore the importance of costing estimates, "Since the decision to develop online courses is often affected by financial factors, it is becoming increasingly important to determine, upfront, the cost of online course production. Many of the programs and educators interested in developing online courses underestimate the costs involved in developing and producing an online course." Furthermore, as more institutions depend on tuition revenue as the largest source of funding, distance education units are now widely regarded as "profit centers". Traditional campus-based programming

has not attempted to provide estimates of "return on investment" (ROI), but since distance education units are often self-funded operations, a determination of fiscal viability is a necessary evil. Gordon, et al. (2009) articulate the benefits of accurate cost estimation, "Efficient and reasonable cost estimation can assist both institutions and educators to realize the actual cost of offering a course online and can thus improve strategic planning and budgeting processes." Our colleagues in the for-profit higher education sector have long since mastered these estimates, and the public higher education institutions will continue to struggle with costing, profitability, ROI, and viability unless competing fiscal models are thoroughly vetted across the higher education community.

The purpose of this article is to explore the quality and growth implications emergent from various incremental costing models applied by distance education units. This paper discusses prior research relative to costing models, and derives three competing costing models useful in the current distance education environment. Specifically, the simple costing model, unit costing model, and marginal costing model are critically analyzed relative to their quality and growth implications. Finally, the paper will provide rationale suggesting that the marginal costing model represents the most accurate estimation.

Tradition and the Problem

Cost modeling for traditional on-campus programs has been a fixture of higher education systems for many years (League for Innovation, n.d.). Traditional programs have been generally analyzed by looking at the following equation (which we will later name the simple model):

Figure 1. Traditional costing analysis.

$$\frac{\text{Direct instructional costs (faculty salaries and benefits, operating expenses)}}{\text{Student credit hours (SCH) produced}}$$

This simple costing model has generally been effective for campus-based academic programs since the costing model has become widely accepted industry practice by many higher education systems. However, traditional assumptions, like service to mission area and the intrinsic value of general education, have rendered such models largely ineffective for determining long-term program viability. In addition, many important campus elements are not accounted for in the traditional model, and often the model is applied retrospectively rather than as a projection of future program strength and costs (League for Innovation, n.d.). This problem is obviously complicated by the dumping of unique constraints and costs of distance education onto a traditional higher education environment. Many institutions of higher education have struggled with the assumptions that should be made about distance education units. Within institutions, it is imaginable that different stakeholders could envision their distance education unit as serving a variety of operational (and not mutually exclusive) agendas:

- Distance education as traditional academic/public service to a mission defined area,
- Distance education as a consumer product,
- Distance education as a strategic response to address budget constraints.

Several costing models for distance education units have been described in the literature, but most models offer no comparative analysis between traditional analyses of ROI and cost. Table 1 details several of the models, costs included, and costs not included.

Table 1. Distance education costing models comparison.

Model	Costs Included	Potential Costs Not Included
Laaser (2008) Hybrid/cohort instruction costing model *Aligns to the Simple Costing Model*	Facility cost for instruction Instructional costs Average travel costs Learning management software	Academic support Instructional design Administration Library access Academic advising Marketing, recruitment, scholarships
Gordon, He, Abdous (2009) Asynchronous Cost Model (ACM) Online course development model *Aligns to the Simple Costing Model*	Instructional design Interface Text, Graphics, Photos, Animation Audio, Video Assessment Learning management software Media deliverables	Academic support Administration Library access Academic advising Marketing, recruitment, scholarships
Annetta (2004) Asynchronous web-based instruction *Aligns to the Simple Costing Model*	Instructional costs Student costs Hidden costs Recruitment costs	Academic support Administration Library access Academic advising
League for Innovation M3 model Asynchronous web-based instruction *Aligns to the Simple Costing Model*	Development costs Teaching and instructional costs Technology and infrastructure costs	Academic support Administration Academic advising Marketing, recruitment, scholarships
University of Nebraska-Lincoln Synchronous and asynchronous instruction *Aligns to the Simple Costing Model*	Instructional costs Development costs Travel costs	Academic support Administration Library access Academic advising Marketing, recruitment, scholarships

It is because of the ineffective traditional model, and the uniqueness of distance education, that new models of costing and ROI must be reviewed and tested.

Simple Costing Model

The simple costing model for distance education units builds on the assumption that only direct instructional costs are attributable to the program (Figure 1). The obvious benefits to the simple costing model are simplicity and familiar application for determining viability for on-campus programs.

There are significant downsides to the application of the simple costing model for distance education unit costs and return. Application of the simple costing model will result in significant costs, many directly resulting from the increased direct expenses, not appropriately applied to the increase in credit hour productivity. By its very nature, distance education operations require large investments to build the technological infrastructure for course design and delivery. While this technology infrastructure can be utilized for on-campus programming, a substantial portion of the cost should be allocated as cost against revenue generated by expansion of credit hour production. Other fixed costs of the institution are also not allocated to the generation of additional credit hour production: academic support, administration, advising, brick and mortar infrastructure, institutional computing, instructional design, library access, marketing, and scholarships are not appropriately charged against revenue in

the simple costing model. Application of the simple costing model will likely result in liberal costing estimates, thus making distance education credits appear less expensive than traditional on-campus credits.

Unit Costing Model

The unit costing model is an outcome of the assumption that all credit producing units must share in the fixed and variable expenses related to the enterprise as well as the unit. In this model, a percentage of all costs are allocated to the distance education unit, in addition to any direct instructional or indirect costs involved with the unit. Under the unit costing model, sunken overhead costs of office space, administrative personnel, campus infrastructure, and institutional computing resources are charged off against every credit hour produced. Overhead costs that are unique only to the on-campus environment (i.e. repair of a classroom building, grounds crew, museum operations) would not be appropriate to allocate against a distance education offering. Some institutions may find it beneficial to incorporate another classification of costs under the unit costing model – opportunity costs. The unit costing model would be expressed as:

Figure 2. Unit costing model.

Percentage of institutional fixed costs (academic support, administration, campus infrastructure, institutional computing, library access) +
Indirect costs (advising, instructional design, marketing, scholarships) +
Direct instructional costs (faculty salaries and benefits, operating expenses)

Student credit hours (SCH) produced

The unit costing model clearly allocates resources that are left out of the simple costing model equation, perhaps to an excess. Under the unit costing model, the discussion really focuses on those existing campus resources that are utilized by the distance education unit (students or faculty) as those expenses are likely much larger than the direct instructional costs and the indirect costs. The beneficial aspect of this model is that any existing resources and direct and indirect costs utilized by the distance education unit are considered as costs. Application of the unit costing model will result in a conservative costing estimate, perhaps making distance education credits look more expensive than production of traditional on-campus credit

Marginal Costing Model

The colloquial expression that "the truth lies somewhere in between" may best summarize this approach. The marginal costing model grows out of the assumption that the traditional brick and mortar operations of the enterprise are sunken costs and necessary whether the distance education unit operates or not. Attributable costs under this model count only those additional expenses added as a result of the additional credit hours produced by the distance education unit. Under the marginal costing model the direct instructional costs, indirect costs, and any additional fixed costs (i.e. additional support personnel, new advisors, expanded online library resources) are counted as costs against the distance education credits produced. The marginal costing model has a strong basis in the accounting and economic literature, named incremental cost analysis in those disciplines (Douglas, 1992; Horngren, Datar, & Foster, 2002). The model is expressed as:

Figure 3. Marginal costing model.

Added institutional fixed costs (academic support, administration, campus infrastructure, institutional computing, library access) +
Added indirect costs (advising, instructional design, marketing, scholarships) +
Direct instructional costs (faculty salaries and benefits, operating expenses)

Student credit hours (SCH) produced

The marginal costing model allocates only those additional resources needed, going beyond the simple costing model. Since only added costs appropriate to the distance education unit are attributable, costing discussions are constrained to actual costs incurred relative to the additional credit hours generated. Application of this costing model in determining return on investment of the distance education unit will result in a moderated incremental estimate, falling between the liberal (simple costing model) and the conservative (unit costing model).

Estimating Profitability

When a determination of the appropriate model(s) is made, estimating profitability is a reasonably simple endeavor. Simply put, profitability of distance learning units occurs when tuition generated from credit hours produced exceeds the cost of producing those credit hours. The expression is simply:

Figure 4. Profitability/ROI equations.

Tuition and Fee Revenue (from distance education credit hours) –
Allocated Costs (from distance education credit hour production) = PROFIT
----------OR----------
Tuition and Fee Revenue per Credit Hour -
Allocated Cost per Credit Hour = PROFIT per Credit Hour

One obvious caveat bears mention in estimating profitability. Finding a suitable costing model (or models) that will support future planning is critically important. Estimates of profitability will change dramatically depending much more on the costs applied to the distance education unit (since tuition and fees generally increase at a more modest linear pace).

Quality and Growth Implications

The complex balance between growth and quality of distance education units has been well documented in the literature. Increasing the quality of instructional programs will likely impact the market demand for the distance education product, but the relationship is not linear and many other systemic factors must be considered. Many books have thoroughly articulated this relationship, thus this discussion will focus on those features which emerge relative to a comparison of the costing models.

Since the simple costing model carries few expenses, other than direct instructional costs and indirect costs, the implications on quality are potentially significant. Since few expenses are attributable, making the case for adding support resources may be much more difficult. Building additional quality is limited to adding additional instructional costs or improving instructional technology. In the instance of additional instructional resources, an institution may consider simply adding faculty, adding resources for training faculty, or spending more to acquire better faculty. Relative to instructional technology resources, certainly better content management systems would be a justifiable expenditure as would allocating resources to improve instructional design. However, there are expenses not directly attributable under this model, like campus support, academic advising, administrative personnel, and other non-instructional, but critically important, costs. In sum, it would be very important to know whether additional expenses relative to quality improvement will be allowed given the chargeable costs associated with the model.

The growth implications of the simple costing model are the most notable. Justifying additional resources under the simple costing model would be quite easy given the relative small costs compared to the two more comprehensive costing models. Program growth and continuance is nearly assumed as long as tuition revenue exceeds the relatively small direct instructional and indirect costs. Naturally, it must be acknowledged that additional unattributed institutional resources will be required to grow a distance education operation. The long-term risk associated with this sole implication should be weighed judiciously in relation to the short-term benefit of additional tuition and fee revenue. Under the simple costing model, the number of "false starts" will be larger relative to those institutions that apply a more conservative costing model.

The unit costing model has some important quality implications. Namely, since so many institutional costs are already assumed under this approach, the addition of more expenses for the purpose of quality improvement are not as likely to significantly impact the bottom-line profitability of the distance education operation. The addition of support personnel, advising, instructional costs, and other quality enhancement expenses will have less impact on the ROI of the operation given the comprehensive costing nature of the model. There is also an argument to be made since quality of educational offerings is largely a systemic construct not related to just instruction or infrastructure or academic support, but to all parts of the system to varying degrees.

The growth implications that emerge from the application of the unit costing model stem from the conservative standard applied. If a distance education unit has offerings that meet this stringent costing standard, then additional growth can be assumed to be profitable. Since so many of the sunken costs are programmed in, the relatively smaller direct instructional and indirect cost increases from offering additional credits are likely to

have little impact on the long-term profitability. In short, the addition of a faculty resource will not have the same effect under this model as it would under the simple or marginal costing model, which are, by definition, less conservative. "False starts" are not likely under this model, but missed opportunities given this conservative costing equation are a much larger risk.

The quality implications of the marginal costing model are easier to gauge since only those additional quality-related expenses are changed against the additional tuition and fees generated. If an institution can easily estimate the necessary expenses relative to quality improvement, then marginal costs can be adjusted to determine the subsequent enrollment growth needed to achieve profitability. Quality related expenses might include: additional faculty to decrease class size, enhancing an advising center, or new course management technology. If an institution seeks only to maintain a modest profit from distance education operations, then one might say that quality can be improved up to the point that the unit falls into unprofitability.

Justification for growth under the marginal costing model is limited only by the accuracy of the cost estimates of adding the additional credit hours. This model also minimizes the budgetary risk to the institution, since only those additional expenses necessary for program expansion need to be estimated. "False starts" are fewer relative to the simple costing model, and not significantly greater than if the unit costing model is applied. The profitability of growth under the marginal costing model should be studied more closely in situations where an institution has seen substantial fluctuation in tuition and fee revenues, but generally this model offers the most risk management while allowing a distance education unit flexibility to build innovative offerings to meet quickly emerging needs.

Conclusion

With distance learning reaching a critical mass in higher education, the need for more robust models of costing and return on investment has never been greater. Historic models of cost estimating have proven successful for traditional programs, but these models often miss the unique expenses that must be appropriately allocated for successful profitability projections of distance education programs.

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