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Peer-Refereed Article

KEYWORD SEARCH

Curriculum
Distance Learning
Philosophy
Quality
Research
Teaching Methods

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Abstract

The combination of today's mobile workforce, expanding internet technology and the need for lifelong learning has sparked a demand for web-based distance learning degree programs. A consortium of five universities offering a Doctoral of Philosophy (Ph. D.) degree through distance learning is challenged to develop a system for quality improvement. This study proposes a quality system model, design and implementation that could provide an effective guideline for the consortium program to supply high quality services. This research documents selected existing processes, reviews relevant standards and good practices, analyzes strengths and weaknesses of the program, and develops the start of a model to assess and improve quality of web-based learning. This research focuses primarily on doctoral education. However, it is believed that much of what is presented may also be applicable to other programs.

Introduction

Doctoral education is by nature rigorous and demanding for students and faculty. While any consortium effort has the potential to leverage strengths from different institutions, it also brings together different cultures, systems and procedures. Educators and online delivery advocates are still trying to determine how best to use the technology (Internet delivery) as a way to improve program quality, raise students' success rate and enhance academic quality and reputation.

One university leads a unique consortium of five universities offering a Doctor of Philosophy degree in this case study. This on-line Ph.D. program supported by regionally accredited Universities delivers an integrated set of technology and management

courses. Merging five or more sets of processes, tools and cultures can lead to differences in delivery, misunderstandings in administrative requirements and ultimately delays and roadblocks for enrolled and prospective students. Traditional processes and tools for ensuring educational quality may or may not be effective in this new environment. Challenges and trends in responding to new technologies and the pressures to supply high quality services for students in distance learning are formidable obstacles (Boehler, 1999).

Purpose of the Study
The purpose of this study is to stimulate ideas and suggest a possible approach for creating a quality model for web-based learning in a dispersed organization. This study provides a preliminary model and suggests supporting tools to improve processes through the application of Quality Management principles. Performance measures, standard operating procedures and process improvement recommendations are offered as part of this roadmap. Strengths and weaknesses are analyzed to identify improvement opportunities. This study resulted in a conceptual operating model at the macro level of a consortium program along with diagrams of selected existing processes.

Review and Document Selected Existing Processes
Understanding consortium systems for a web-based Ph.D. program required analyzing the systems in a series of steps, moving from a macro view approach to a more detailed micro view process. This began with creating a conceptual model of a quality management system for the consortium, and developing process maps of selected parts of the program. Figure 1 presents the major necessary elements of a quality management system and the major patterns of information flow which were followed as a basis for analysis of the consortium.

The two boxes in the middle of Figure 1 represent the academic and administrative processes of the consortium. The surrounding boxes signify the quality

management system. Once processes have been documented, and consistency of processes attained, appropriate performance measures can be identified and tracked. These may be process measures, output measures, or more likely, both. The Malcolm Baldrige criteria, identified from the literature, were guiding principles for the current work as follows:
  a) Vision, mission and value statements guide our actions (Baldrige 1.1a (1) & (2)).
  b) Strategic goals, voice of the customer, guide improvement (Baldrige 2.2a (1) & (4), 3.1a (2) & (3)).
 c) Data from process and output measures will drive decision-making (Baldrige 4.1a (1)).

These criteria while important and clearly considered as a basis for future work, were only the starting points. When the model is developed into a system for the application, it is believed that data from these measures will allow the improvement of critical processes. As improvements are made, determined through fact-based observations, corresponding changes

should be made in process maps and standard operating procedures. As part of the foundations for the model, two important maps of current consortium processes were drafted and presented as part of the work. The first is the overall processes in turning applicants into graduates (Figure 2). Each box in this macro view represents a sub-process – or a series of steps – which may also be mapped. The second is a sub-process of establishing a program of study, see Figure 3.

Mapping provides a foundation for understanding processes and suggests points for monitoring and opportunities to streamline. The process in Figure 2 begins with a sub-process of application submission and ends with graduation. If a block in the higher-level process map has many sub-steps, these should also be mapped and procedures drafted to assure consistency and understanding.

Once processes are mapped, procedures need to be defined. This level of process documentation is necessary to assure consistency over time and between institutions. When processes involve

Figure 1. A Flowchart of Conceptual Model of Consortium Processes
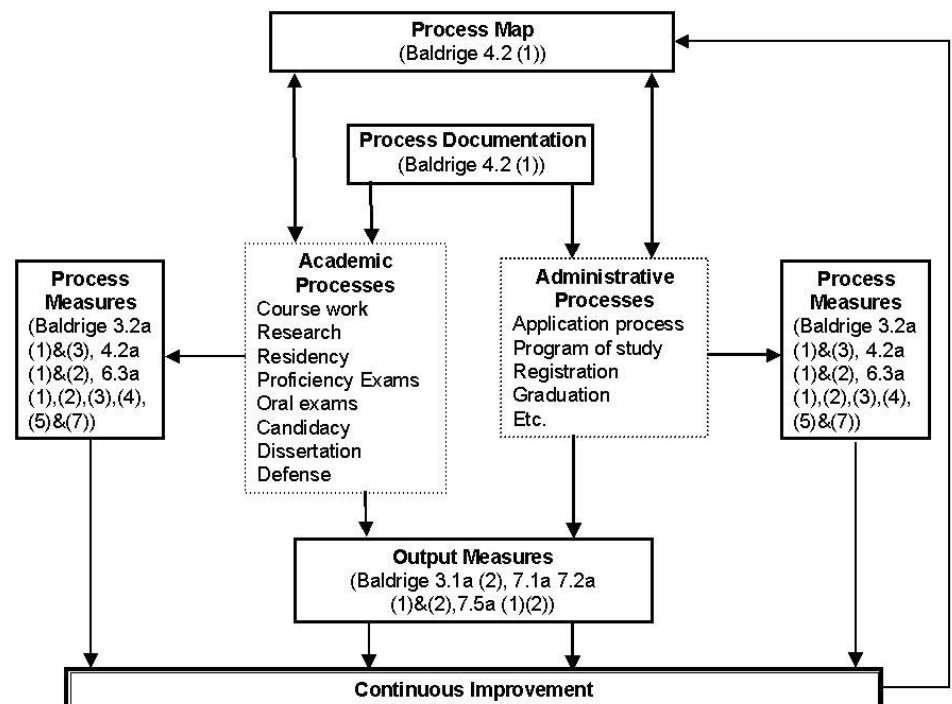
multiple people, departments and institutions, standard operating procedures (SOPs) enable consistency if they are applicable and utilized. As an example, Figure 3 is a map of the sub-process for establishing a program of study (POS). Consistency, is a key for reducing variation, and must be attained before true improvement can be achieved. As process improvements are made, the SOPs should be updated so they reflect current practice. Internet platforms and technology can be used to streamline and guide the process steps.

As part of the model design process, the authors conducted preliminary analyses of strengths and weaknesses of existing quality systems in the consortium. This analysis of the consortium quality processes identified several opportunities where quality could be enhanced. While there are several strengths, perceived weaknesses provided motivation to seek external sources of improvement. Table 1 (see page 5) presents strengths and weaknesses in the consortium quality systems. Additionally, these strengths and weaknesses could provide the basis for a survey to help validate and further address various areas of concern in a consortium.

Good Practices and Quality Standards

Web-based course delivery is quickly becoming the predominant method of distance education. Associated with this are a growing number of quality standards and good practices which on-line educators and developers can use in the instructional design and course content in web-based environments. These were identified as follows: BSR/ASQ-Z1.11, Malcolm Baldrige Award and program assessment. Each of these are presented and explained as good practices for consideration in the model.

BSR/ASQ-Z1.11. A first set of standards to help educators achieve consistency and excellence in both the delivery and administration of programs such as the consortium is the BSR/ASQ – Z1.11. International Standards Organization (ISO) guidelines (American Society for

Quality, 2000). The purpose of the Z1.11 standard, as a part of the broader ISO 9000 standard, is to provide a quality assurance system for education. Z1.11, like all ISO standards, does not ensure quality of products or services, but rather certifies that organizations document, implement, maintain and continually improve a quality management system based on organizational design

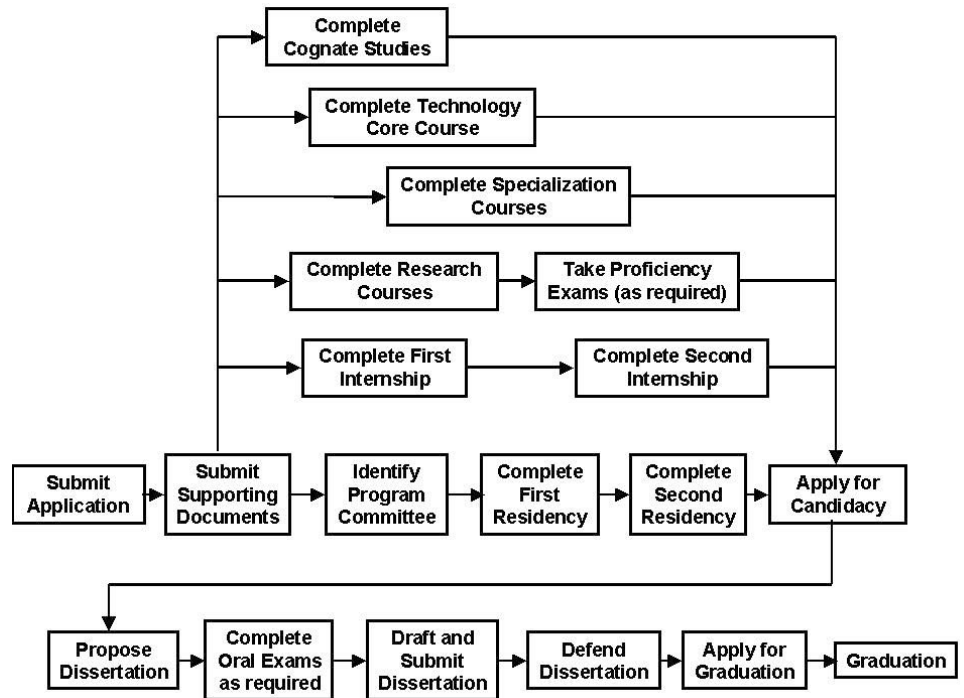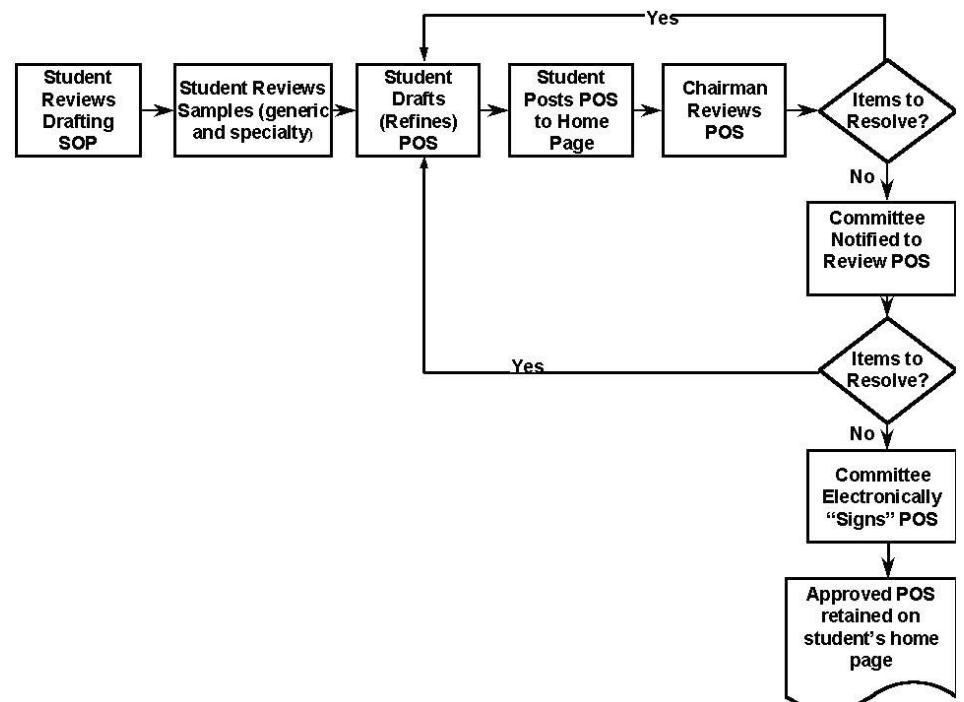*Figure 2. A Flowchart of Consortium Ph.D. Processes for Turning Applicant into Graduate.*

Figure 3. A Flowchart of Process Map for Establishing Program of Study.

and implementation. BSR/ASQ – Z1.11 standards were first published in 1994 and updated in 2000. The Z1.11 standard is based on eight ISO 9000 quality management principles which contain customer focus, leadership, involvement of people, process approach, system approach to management, continual improvement, factual approach to decision making, and mutually beneficial supplier relationship.

Malcolm Baldrige Award. A second major standard to help achieve best practices is the Malcolm Baldrige Education for Performance Excellence Award. The Malcolm Baldrige Award criteria are a set of tools that organizations can use to conduct an objective self-assessment of organizational performance (National Institute of Standard and Technology, 2002). The award's criteria are concerned with all aspects of organizational performance with an emphasis on organizational results. The categories of the Malcolm Baldrige Education for Performance Excellence award are: leadership, strategic planning, student, stakeholder and market focus, information and analysis, faculty and staff focus, process management and organizational performance results. An organization performs self-assessments in each category to determine its readiness for an external review and once that determination is made; experts in the field of quality perform the review on-site. Compliance to the award criteria is based on the organizational self-assessment.

Program Assessment. A third area for assisting educators in understanding quality is thought to be broadly related to program assessment. Chickering and Gamson's seven principles for good practice in undergraduate education (1987) contribute to this review. These good practices, analyzed by several studies (Lang, 2000; Test, 2000; Cole, 2000), are thought to also apply to web-based course delivery, both graduate and undergraduate. These principles noted by Chickering and Gamson are: encouragement of student-faculty interaction, encouragement of cooperation among students, encouragement

of active learning, prompt feedback, emphasis on time of task, communication of high expectations, and respect for diversity, learning styles.

Although focused primarily on the process of instruction, Chickering and Gamson (1987) provide useful definitions of web-based delivery attributes. This supported the broader model quality system under consideration, and provided other key elements related to program assessment.

Additional components in the area of good practices encompass what the authors identify as instruction and services. Boehler (1999) focuses on 17 topics in design for a viable online distance learning program plan. These topics include change issues, adult learners, infrastructure and operations, staff support, staff training, educational design, curriculum, communication, technology, quality control, copyright, universal access, cost factors, student services, regulation and policy, competition and marketing, and the world wide web.

Furthermore, curriculum design is an important key, the goal being to design

a curriculum comparable in quality (or perhaps even superior) to traditional classroom courses. Factors to consider in selecting courses and programs to offer online include: marketability, suitability for online delivery, student interest, faculty interest and qualifications for teaching, how online courses compliment existing courses, and technical support needs or development costs (Boehler, 1999).

Student services can be divided into three groups: administrative, instructional support, and advising and counseling services/resources. McGrath, Middleton, and Crissman at World Campus, Pennsylvania State University (2001) explain details of each category:

a) Administrative services may contain information for students, self-assessment of readiness to participate, a call center, registration assistance, collection of tuition and fees, a bookstore, and student record management.

b) Instructional support services may include orientation that is linked closely to prospective student information, library, services for students with disabilities, technical support, and activities

Table 1. Strengths and Weaknesses in Consortium Quality Systems.

Weaknesses	Strengths
Lack of consistent hardware, software and systems incompatibility.	Online infrastructure, in general, provides ideal team working area, value adding learning potentials.
No common server and shell software such as Blackboard, WebCT, as base of operations.	Seamless functioning regardless of geography, location and mobility restrictions.
Diversity in policies, procedures and rules at consortium institutions add to inconsistencies.	Learning time is flexible for working adults.
Most "official" approvals done in hard copy form. This process creates lost paperwork and it is hard to track.	Broad exposure to multiple institutions, faculty, various student, and views.
Weak demographic details and data that is not available to support faculty and students.	Web provides information for marketing, and communication "on demand".
Procedures, methods unique to online methods not used, creating missed opportunities.	Solid traditional PhD replicated "online", quality; integrity built in, from existing institutions.

and services that promote a sense of community.

c) Advising and counseling services and resources may incorporate pre-admission counseling, admissions, advising, career services, and personal counseling.

Neither student services, nor any other single part of program assessment, are the primary focus of this article. Elements of this paper may be further researched and analyzed in future studies.

Preliminary Analysis

Based on the good practices and quality standards (GPQS) sources reviewed, as well as elements identified from other areas, an analysis was done to identify necessary quality elements and attributes for design and implementation of the model quality system. The GPQS elements and attributes were organized in a tabular format showing key findings as a basis for the quality model. A statement summarizing each GPQS categorical finding and highlight was identified as a key indicator of what should be occurring in the model. The basis for each area was also tied to the main sources previously provided, as part of the analysis, as shown in Figure 4.

A Quality Model for Web-based Learning

Factors studied that impacted the design of the quality model, are summarized and briefly explained in the previous section and Figure 4. The six GPQS elements are the main components in the quality system model detailed in Figure 5. Feedback from students and faculty directly contributed to the quality model with staff and administration, all relationally presented.

Finally, it is suggested that implementation may be influenced by areas identified in the model. While this particular model is oriented to the electronic delivery of a doctoral program, it may also have significant implications for other applications in higher education.

Summary and Conclusion

Quality principles and practices have long been applied in business

Figure 4. Good Practices and Quality Standards (GPQS) Summary, Analysis. The six GPQS areas are pivotal elements in the model design. Significantly, this GPQS may also provide insights into potential issues related to systems implementation.

BSR/ASQ-Z1.11	Malcolm Baldrige	**Program Assessment**
Customer focus	Stakeholder focus	Student-faculty issues assessed
Customer, stakeholder practices. Understanding customers, and all persons engaged in systems, is pivotal to improvement and to make systems functional at reasonable levels. The way people interact and communicate, collaboratively, is critical to understanding all relationally.		
Leadership	Strategic planning	Program expectations, assessed
Collaborative strategic planning, leadership, paradigm shifts. Identification of vision, mission, other foundational statements, long-term goals of achievement, and reflecting and leading cooperative views and expectations in new ways of thinking and doing, defining the systems.		
Process approach	Process management	Active, diverse learning
Processes organized for effective, diverse learning. Processes in place, designed, configured, and managed, from recruitment through functioning as an alumnus, for immediate, ongoing teaching and learning in active, diverse ways using robust technologies in all functions, well trained, supported.		
Continual improvement	Faculty and staff focus	All
Stakeholder, total community continuous improvement. Based on seamlessness in systems, ready access to all systems, data, and documentation necessary to function, all are able to and expected to improve. These systems should reflect same in routine ways, particularly as student satisfaction.		
Supplier relationships	Systems approach	Delivery, time of services
Customer supplier relationships, systems performance. All use systems for day-to-day functions, have information needed to do work in timely ways reflecting that all understand what is required, why, and how to satisfy requirements and needs of all users to maintain positive relationships.		
Fact-based decisions	Information and analysis	Prompt feedback, assessment
Data and documentation-based decisions. Decisions are solidly based in clearly stated procedures and other documentation, as well as data collected over time to reflect immediate needs and feedback as well as trends which will logically emerge to guide improvement over time.		

and industry, and in recent years, in education. Best practices have been documented and are clearly changing, in part due to web-based influences. Quality principles and practices, as part of a model system, can guide the improvement of a complex organization. Differing procedures of multiple universities involved as suppliers and customers, along with multiple roles of various stakeholders, demand planning and structure to ensure consistency and

drive continuous improvement. Consortium efforts to provide web-based instruction need to be streamlined to present the most effective processes and procedures and that ongoing review and improvement must be part of the process. Various elements and their relationships are addressed through the model examples indicated. A preliminary model, as a starting point for further work, was also provided. While alterations and refinements may

be necessary, this can be effectively applied anywhere. A successful model quality system can increase success for students and enable the consortium to be a leader in advanced education globally.

Figure 5. Quality System Model, Design and Implementation

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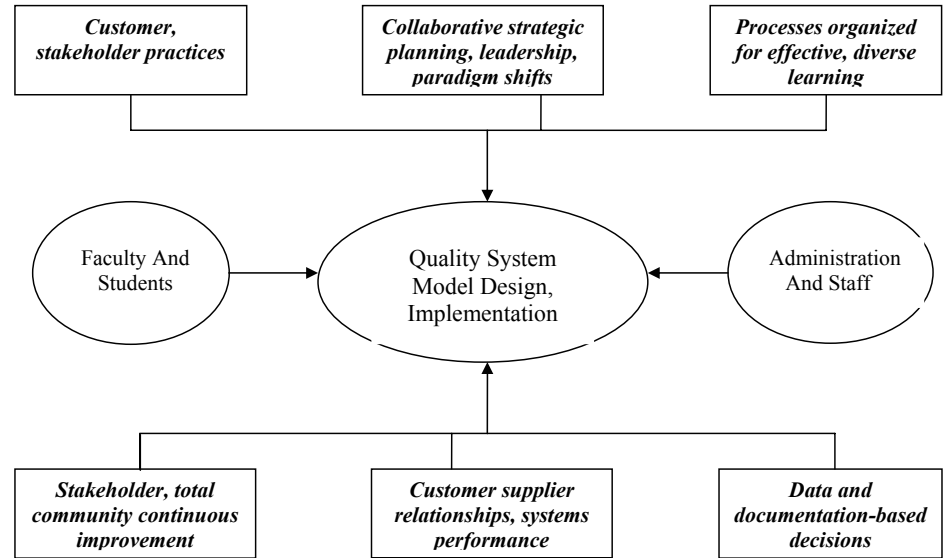
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