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**AN EXPLORATORY COMPARISON OF DELIVERY COSTS IN CLASSROOM  
AND ONLINE INSTRUCTION**

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AN EXPLORATORY COMPARISON OF DELIVERY COSTS IN  
CLASSROOM AND ONLINE INSTRUCTION

by

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## **Dedication**

To my father, who continually demonstrates the value of higher learning,  
to my mother, who continually expands the concept of knowledge,  
to my wife Celeste, for her steadfast love and support,  
and  
to my daughters, Sarah and Audrey,  
in the hope that they will continue to enjoy learning as much as I do.

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The University of Texas at Austin, 2009

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Enrollment in online courses within colleges and universities is growing at a rate far exceeding that of enrollment in classroom-delivered, face-to-face courses. Given this growth, it is important that administrators understand the costs required to deliver online courses. A frequently asked question by policy-makers is whether online instruction is more or less expensive to deliver than comparable face-to-face, classroom-delivered instruction.

The objectives of this study were to 1) develop an exploratory model for deriving a cost measure for classroom-delivered instruction and an analogous model for deriving a cost measure for delivering online instruction, 2) perform an inter-institutional comparison of both classroom-delivered and online-delivered courses, 3) identify the opinions and assumptions of various campus administrators regarding online courses, and 4) identify the role of costs in the academic decision-making process regarding offering online courses.

The study employed a mixed-methods research methodology. The quantitative analysis was performed using publicly available data from seven public institutions. The qualitative analysis entailed directed interviews with 12 pre-identified campus decision-makers from those institutions: six chief business officers and six chief academic officers.

The study found that, for the organizations studied, online courses are delivered at a lower unit cost than face-to-face courses. In addition, the study determined that as an academic decision factor, cost is overwhelmed by other factors such as enrollment growth, campus space constraints, and broadening access.

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## Chapter One

### *Introduction*

The introduction of online courses into the realm of higher education may well prove to have more impact than any other “educational technology” introduced into academe since the textbook (Massy & Zemsky, 1995). While other technologies have enabled instructors to better highlight or illustrate their lectures or deliver other forms of supplemental materials, online courses (when properly designed) can enable greater learning outcomes. While this assertion may be open to dispute, the growth of online courses and programs is not. The rapid expansion of online delivery of courses leaves open the issues of costs and cost effectiveness. This study is a step toward studying those issues.

The Sloan Consortium, which represents a group of institutions focusing on quality in online education, estimates in their most recent annual assessment of the size and scope of online courses, that over 3.9 million students were enrolled in at least one online course in the fall semester of 2007 (Allen & Seaman, 2008). There are many motives which have driven institutions to adopt online delivery. These motivations cover the spectrum from profit, to increased access for students, to a lack of classroom space.

Primarily because they represent a less familiar form of pedagogy than traditional classroom instruction, online courses have been required to demonstrate quality beyond what has been expected in the recent past for face-to-face or even

technology-enhanced courses. Online courses are held to higher standards of transparency and quality than face-to-face courses, and this heightened oversight has resulted in a lack of acceptance by some regarding the general quality of online courses. Although traditionalists might object to the delivery of college courses without the familiar immediacy of face-to-face interaction, online delivery is now thoroughly part of the mainstream in our colleges and universities.

### *Changing Motivations*

In the words of the former Federal Reserve chief Alan Greenspan, the “Internet bubble” of the late 1990s and early 2000s spurred a period of “irrational exuberance” (Greenspan, 1996). Higher education was not exempt from the excitement fostered by anything “Internet,” and many institutions rushed into delivering online courses with expectations of large financial returns. While large amounts of investment capital were put into building online courses, programs, and even complete organizations, the reality did not live up to the hype in many cases. The Weather Station Project was established to assess the online course market and track faculty and student perceptions regarding this new phenomenon. Its final report entitled “Thwarted Innovation: What Happened to E-Learning and Why,” analyzes the significant chasm existing between the early hype behind e-learning and the reality that ensued. It is worth quoting in some detail:

Not surprisingly, perhaps, the reality never matched the promise – not by a long shot... While there has been a burgeoning of distance education, the big success stories owe more to their past market triumphs... than to

any particularly imaginative melding of learning and technology.

(Zemsky & Massy, 2004, p. 3)

It should be noted that the authors of this quote are the same individuals who predicted that e-learning would have as significant an impact on higher education as the textbook.

By 2004, there took place a significant shakeout of the most highly-leveraged, speculative online providers. Virtual Temple, Fathom, UNext, NYU Online, the California Virtual University, and others all launched with great fanfare between 1998 and 2001 and were out of operation by 2002 (Hafner, 2002). In the face of these well-publicized failures, more cautious colleges and universities began to discover a different value in online delivery: Access, meaning the opening of doors to higher education for individuals blocked from pursuing higher education due to time poverty or geographic isolation. Online courses provided options for a different student demographic. They are not the traditional college-age students who move seamlessly from the high school campus to the university campus. These students tend to be working adults. Online delivery of courses and programs immediately brought new students and new enrollments to institutions.

Purely financial measures of success were no longer paramount, and institutions began to understand that the integration of online courses into their catalogs not only responded to student desire for greater scheduling flexibility, but allowed them to expand their reach greatly to formerly excluded constituencies. As one New York Times article stated, “increasingly, students are finding that ivy walls do not a college make” (Schwartz, 2004).

As colleges, universities, and states struggle to meet the increasing demand for higher education, the ability to provide high-quality online programs becomes an important tool to meet a variety of strategic goals. Not only does the option of online programs immediately increase the potential student audience to include working adults, but online offerings, by virtue of their time-flexibility, potentially increase the average load for on-campus students, and may reduce the need to undertake very costly capital construction projects by mitigating some small percentage of the need for physical classroom space.

However, it is an open question whether the costs of delivering these courses are in line with the costs associated with offering traditional face-to-face instruction. Sound decision-making on the part of campus leadership requires sufficient and reliable data in order to enable reasonable resource allocation choices. To date, there has been little research comparing the costs of delivering a course in the traditional classroom mode and in a completely online fashion.

### *Problem Statement*

Creating a well-designed online course can be an expensive endeavor. In addition to significant time and effort on the part of the authoring faculty, course development may require the work of instructional designers and/or multimedia specialists (Paulson, 2002). The need to develop online assessments, write lessons, create or find appropriate learning objects to integrate into the course increases the development costs, when compared to the creation of a traditional lecture-format course.

Course development costs in many ways can be considered a one-time investment, while delivery costs are ongoing and repetitive. Unlike the demonstrably higher costs associated with the development of an online course, the picture is less clear regarding whether delivering a course online costs more or less than face-to-face delivery. There is some evidence to indicate that online delivery increases costs (Morgan, 2000; Rumble, 2004; Schiffman, 2005), while other reports indicate a reduction in delivery costs as compared to more traditional methods (Meyer, 2006; Robinson, 2005). These studies include or exclude various costs in their analyses, and therefore derive different outcomes. Indirect factors affecting costs also have an impact on these studies. For example, the level of centralization or institutionalization of the organizational structure responsible for supporting the delivery has a large impact on costs. The depth and quality of online student services is also a cost factor. However, the reduction in use of the physical plant due to online activities should equate to a reduction in direct delivery costs.

There is ample anecdotal evidence to indicate that online instructors work longer or harder than their classroom based peers. However, this should not be considered a universal condition of online instruction. When assessing the amount of work required of an online instructor, the most important single variable is the design of the course. Just as there is anecdotal evidence which says online instruction is more work-intensive than classroom, there can be found instructors who have significantly reduced this workload through thoughtful course design. What can be said is that faculty workload related to online instruction is an area which has not been adequately studied and therefore no broad conclusions can yet be



drawn. When examining the costs associated with various course delivery modes, it must be noted that instructors are generally not paid by the hour. That is, the cost to the institution should be the same whether the instructor works 40 hours a week or 80.

College leaders are frequently called upon to make decisions which entail the allocation of scarce financial resources. Understanding the costs of delivering an online course therefore becomes an important factor in that decision-making process. Other factors certainly play a role in institutional decision-making, but failure to understand the cost structures or basing decisions on unfounded assumptions may lead to undesired and expensive outcomes. In lieu of reliable data, many campus policy-makers fall back upon untested assumptions regarding costs of online delivery. These assumptions may or may not be accurate.

### *Purpose of the Study*

This study was designed to explore the underlying cost elements within two distinct course delivery modalities: traditional face-to-face and completely online. The study was conducted in two parts. In the first part, institutional cost data from a specific set of institutions was compared to the cost data of an organization which provides fully online courses and degree programs. In the second part of the study, interviews were conducted with Chief Academic Officers and Chief Business Officers to ascertain their underlying assumptions regarding the costs of online course delivery and to gauge their reaction to the results of the inter-institutional cost comparison produced in the first part of the study. The study results provide insight

into how delivering online courses might affect institutional budgets and it is hoped that this information will be of use to campus decision-makers.

It is important to note that this study intentionally excluded the direct cost of instruction from the cost analysis. Instructional costs to the institution were assumed to be the same regardless of the delivery mode. This is not to say that the amount of work is the same for the two delivery modes – that is a subject for a different study. In general, faculty are not paid based on the amount of work per course, rather they are paid based upon teaching a set number of courses per academic term.

### *Research Questions*

The study's questions are stated below. They focus specifically on the costs of the delivery of courses, and are exclusive of course development costs.

RQ1: What role does cost play in the institutional decision to offer an online course in comparison with a face-to-face course?

RQ2: What are current best practices relating to cost determination for online course delivery?

RQ3: What are the perceptions of campus leaders regarding the delivery costs of online courses in comparison with face-to-face courses?

RQ4: Does the role of cost information in decision-making differ based on the size and mission of the institution?

### *Significance of the Study*

A few cost assessment systems have been developed which look at development and delivery costs for technology-enhanced courses, including the Technology Costing Methodology (TCM), the system developed by the National Center for Academic Transformation (NCAT and the Flashlight Project. However, these costing methodologies focus more on the costs associated with integrating technology into traditional classroom environments and less on costs associated with complete online delivery ("The Flashlight Program," 2007; Jones, 2004; Twigg, 2003).

Activity Based Costing (ABC) studies have previously been performed in higher education, with mixed results. In general, these studies have focused on defining and allocating specific work activities associated with a product. ABC works well for industries with discrete inputs and outputs, and a well defined product. As an industry, it proves difficult to apply activity based costing methods in higher education, since the product (education) is poorly defined and the customer is also the product. In other words, not only are students the customer of the institution, they are also the product of the institution. As will be seen in Chapter Two, a specific comparison between the underlying costs of online and classroom delivery, regardless of study methodology, has not been approached in a systematic way.

## *Definitions*

The following definitions were used for relevant terms in this study:

### *Course*

A course is defined here to mean one section of a class for which college credit is issued. It is assumed to mean a standard semester or quarter-length amount of instruction delivered under the authority of an instructor or faculty member.

### *Face-to-face course*

For the purposes of this study, a face-to-face course is defined as one in which the instructor and the students are in the same place at the same time, typically a campus classroom. The terms “traditional format course,” “classroom-based course,” or “lecture-format course” are used analogously with face-to-face course.

### *Online course*

An online course is here defined to mean a course in which all instruction takes place over the World Wide Web. The terms “Internet delivered course” and “web based course” are used analogously with online course.

### *Technology-enhanced course*

A technology-enhanced course is primarily a face-to-face course which utilizes the Internet to deliver content, but instruction remains in the classroom.

### *Hybrid course*

Somewhere between an online course and a technology-enhanced course is the hybrid. A hybrid course is one in which some portion of the instruction takes place face-to-face and some portion is offered over the Internet. “Reduced seat time course” is an analogous term.

### *Annual budget*

Institutional budgets are estimates of future revenues and expenditures for a specific fiscal period, usually a year. They are planning documents and not a record of actual revenues and expenditures.

### *Annual financial reports*

Public colleges and universities are required to produce annually a set of financial reports according to established accounting standards. Annual financial reports contain information on actual revenues received and expenditures incurred by an institution during a fiscal year. They are a better record of revenue and expenditures than budgets.

### *Direct instructional costs*

This represents cost to the institution to support the direct instruction in a course. This typically includes a portion of the instructor's salary and possibly the stipend provided to a graduate teaching assistant. For the purposes of this study, instructional costs were excluded because, as a cost to the institution, they were considered constant regardless of the delivery mode.

### *Course development*

Activities associated with preparing a course for delivery. For all courses, this includes lesson planning and development of a syllabus. For online courses this may also include development of multi-media elements and an emphasis on writing explanatory text for inclusion in the course.

### *Course delivery*

Course delivery refers to making a course section available for students to engage in learning. A course can be delivered via a variety of modes, the most prevalent of which are face-to-face and online.

### *Organization of the study*

This chapter has provided a general context for a study of the assessment of costs associated with the delivery of college and university courses in both the traditional face-to-face and online delivery modes. It has also set forth the basic research questions which drove the study: Given an analysis of institutional cost data, the study sought to determine if there is a significant difference in delivery costs across the two delivery modes; whether there are distinct differences in delivery costs which correlate with the size and mission of the institutions; and an assessment of the perceptions of campus leaders regarding delivery costs.

Chapter Two provides a comprehensive review of the pertinent literature from the fields of economics and accounting, and from practitioners in the field of online learning. It begins with an analysis of the unique economics of public higher education, and then examines the specific issue of costs analysis in higher education. A specific set of previous cost studies related to online instruction is reviewed as well.

Chapter Three describes the methodology used in the study. It lays out in detail the sources of data, the algorithm used to derive a single unit cost for delivering a course both face-to-face and online, and the types of analyses performed

on the data. The interview process and qualitative analysis methodology is also described. Finally, Chapter Four presents the results of the study, while Chapter Five offers discussion and thoughts on future research.

## Chapter Two

### *Literature Review*

A recent report from the market research firm Eduventures found that “the total number of students in online programs [as opposed to students in online courses as reported by the Sloan-C group] at the end of 2006 is estimated to have exceeded 1.5 million (24% growth over 2005) and represents 8.6% of all higher education students in the United States at degree-granting Title IV eligible institutions,” (Shapiro, 2007). What is fueling this growth? The reasons stated by campus leaders for offering courses online vary significantly. In a recent study, the following were all listed as strategically important reasons for offering online courses: increase student access, attract students from outside the traditional service area, improve student retention, increase rate of degree completion, provide pedagogic improvements, optimize physical plant utilization, increase diversity of student body, reduce or contain costs (Allen & Seaman, 2008). Similar sentiments are echoed in a November 2007 report issued by the National Association of State Universities and Land-Grant Colleges (NASULGC), with well over 60% of respondents agreeing with the statement that “online education is critical to their long term strategy” (*Online learning as a strategic asset: A survey of presidents and chancellors*, 2007, p. 8).

This is not to say that online instruction is without its critics. From cautionary notes sounded by Bok (2003), who worried that moving courses online is



yet another step in the commercialization of higher education, to the more direct Kirp, who stated,

The technology is only a means. Everything turns on how it gets used. In the early 1990s, when the Internet was still in its infancy, there were dreams of an infinitely richer world of ideas about to be born. Instead the market rules, and the Web has turned into a shopping arcade” (Kirp, 2003, p. 262).

The most strident voice railing against online learning may belong to David Noble, a Canadian social scientist. He ascribes a purely bourgeois motivation to the drive for moving courses online when he writes,

[T]he technology is being deployed by management primarily to discipline, deskill and displace labor...once faculty put their course material online...the knowledge and course design skill embodied in that material is taken out of their possession, transferred to the machinery and placed in the hands of the administration (Noble, 2001, p. 32).

Yet there can be little argument that colleges and universities are now faced with a myriad of pressures for which online instruction offers some relief. Alongside the continuing financial constraints under which institutions operate, there is a growing requirement by accreditors and legislators to demonstrate learning outcomes. Online instruction, when properly designed, shows great promise on both of these fronts. The question of quality in online courses as represented by student learning outcomes has not yet been examined through large longitudinal studies. However, there have been hundreds of small scale comparative studies, the majority

of which show no statistically significant difference in the quality of online classes when compared to classroom based instruction. *The No Significant Difference Phenomena* (Russell, 2001) is a meta-analysis of over 350 studies in this area.

With the large number of studies indicating that learning outcomes of online courses are at least equal to those of traditional face-to-face courses, the quality question can be tabled for now. The open question then becomes one of cost. Attention falls to the economic questions: Is there an economic or financial incentive to undertake delivering courses online? How do the development and delivery costs compare to those of classroom instruction?

#### *Economic Literature*

Before directly approaching these questions, the underlying financial and economic structure of higher education should be examined. The literature regarding the economics of higher education in the United States illuminates the unique business model of colleges and universities. The characteristics which define the enterprise of colleges and universities – those elements that require a more complex analysis of their operations – are the very things that have kept economists interested in their study. These characteristics include, “...the peculiarities of production, the particular forms in which competition manifests itself, the institutional oddities in the labor market for faculty, and the [higher education] industry’s role in the distribution of income and influence in the country”(Clotfelter, 1999, p. 3).

Institutions of higher education exhibit some but not all of the characteristics of a non-profit firm, yet they also exhibit market-driven competitive characteristics

as well. The non-standard construction of the educational enterprise is well known. Analyses normally used for business or non-profit enterprises may not be appropriate for use in higher education. Over 50 years ago, in an article in *The American Economic Review*, Seymour Harris (1953), noted four “peculiarities” regarding the higher education market:

First, many potential “buyers” are excluded from the market. Students have to meet minimum standards (e.g., a high school diploma). Such restrictions limit the number of “buyers” of higher education. Second, buyers are not usually asked to pay the full costs of an education. The effect of “sales” below cost is to increase numbers seeking a college education, though the net effect here is not so great as is commonly supposed. Education below cost is offered despite the fact that a college graduate can look forward to an income [greater] than a non-college graduate. Third, the competition is not primarily a price competition but rather one for attracting the most-qualified buyers, that is, the highest quality students. Fourth, the major costs of education, inclusive of extra costs of living and income foregone, are still borne by the individual, though there is a strong public interest involved. (p. 344).

The “product” of the higher education production process, the student, is also the consumer of the services provided. Winston calls this characteristic customer-input technology, since clearly the students are not passive recipients of learning but active participants in the process (1999). Recognizing this unusual circumstance is fundamental to understanding the non-standard behavior of the higher education

“firm” when using the language of business. For example, businesses engage in a basic quality versus cost analysis when sourcing raw materials. Other decisions determine how to market and price the final product. In the business of higher education, these decisions must be melded together because the final consumer is the end product as well as the raw material. The results affect admissions policies and tuition rates on the input side and affect graduation rates and institutional prestige on the output side.

Any analysis of higher education must be cautious regarding the wide diversity represented by the thousands of U.S. colleges and universities. Over the years, there have been several schema and taxonomies put forth which seek to classify institutions. These were variously based on size, funding sources, “prestige,” mission, or number and level of degrees awarded. By far the most common classification system is that of the Carnegie Commission, which combines several of these criteria and is organized around three primary variables: what is taught (undergraduate and graduate instructional program classifications), who the students are (enrollment profile and undergraduate profile), and what the setting is (size & setting) (“The Carnegie Classification of Institutions of Higher Education,” 2005; McCormick & Zhao, 2005). In examining cost structures these mission-specific variables are critical. Table 1 shows a 2x2 matrix of public/private and large/small four year colleges and universities, indicating common characteristics of mission and diversity of revenue sources.

*Table 1: Institutional Characteristics*

	Large	Small
Public	Broad mission in support of state goals. Wide variety of funding: state, federal research funding, tuition.	Targeted mission, usually regional in scope. Less selective admissions. State supported, yet more reliance on tuition.
Private	“Elite” or “prestigious” institutions. Large endowments, tuition and research funding.	Typical liberal-arts orientation and/or religious affiliation. Exclusive reliance on tuition revenue to fund operations.

This diverse milieu is further complicated by the complex nature of financing the enterprise. An amalgam of state and local governmental appropriations, private endowments, student-paid tuition and fees, multiple sources of financial aid, research grants, and internal business operations all contribute toward the operation of the college or university. The mix of these revenue sources has changed significantly over time.

*The Productivity Problem in Higher Education*

Colleges and universities are fundamentally dependent on a particular class of highly skilled labor: the faculty. If the university is a place for producing learning outcomes, then the faculty are the prime engine for that production. The rate of productivity, however, is acknowledged to be highly resistant to efforts to increase it. Unlike virtually all other sectors of the American economy, the rate of production of colleges and universities, as measured by the faculty-student ratio, has stayed essentially flat for well over 100 years (Bowen, 1980).

While technology has dramatically increased the productivity of all other systems within the university -- from admission to registration to processing tuition payments to computing and research -- it has not had a significant impact on the central teaching and learning mission. Johnstone (1999) places responsibility for this phenomenon on both the faculty and the students. He states, "...the major remaining productivity problem in higher education may not lie in excessive costs but in insufficient learning..." (p. 14). He then lists symptoms of this phenomenon including the increasing use of adjunct professors, "unavailability of courses at the right time; aimless academic exploration; excessive nonlearning time in the academic day, week, and year; [and] insufficient use of self-paced learning" (p.14).

Massy and Zemsky (1995) echo the view that faculty members themselves may well be the greatest impediment to increasing academic productivity. In their early work on the adoption of information technology in higher education they list four barriers to adoption. The first is traditional academic values, which they describe as the set of established institutional norms related to teaching methods, faculty autonomy, and notions of productivity. Second are internal definitions of productivity. Most faculty consider productivity in terms of scholarship, especially research, and in terms of teaching tasks rather than learning accomplishments. Third are the incentive structures. In many institutions, incentives for teaching are few while those for research are significant. Finally, assessment can be a barrier to increasing academic productivity as many academic departments pay little attention to teaching and learning processes -- while research is carefully evaluated, teaching and learning seldom are audited effectively.

In any discussion of the productivity issue in higher education, one must look to the work of William Baumol. In 1966, he and William Bowen articulated their theory of the “cost disease” of certain “productivity immune” industries in their book, *Performing arts, the economic dilemma; a study of problems common to theater, opera, music, and dance*. Updated by the author thirty years later in an article for *The Journal of Cultural Economics*, the theory is straightforward and powerful. For those sectors of the economy where the major means of production is based on individualized and specialized labor, production will be nearly stagnant, but costs will continue to rise. Baumol uses the symphony orchestra as the primary example, but higher education clearly falls into this category as well:

The common element that characterizes all stagnant services is the handicraft attribute of their supply processes. None of them has, at least so far, been fully automated and liberated from the requirement of a substantial residue of personal attention by their producers. That is, they have restricted reduction in the amount of labor expended per unit of their output. ... There are at least two reasons why rapid and persistent productivity growth has eluded the stagnant services. First, some of them are inherently resistant to standardization... A second reason why it has been difficult to reduce the labor content of these services is the fact that in many of them quality is, or is at least believed to be, inescapably correlated with the amount of labor expended on their production (1996, p. 194).

Simultaneous with stagnant production in these productivity-immune systems, organizations will also be faced with normal cost inflation, but will have no means to offset rising costs with rising productivity. The result will be that prices in the stagnant sectors will increase at a rate which is substantially higher than inflation. In the case of higher education, evidence of this effect can be seen in the aggregate average rate of increase in tuition across the country – a rate of increase that has averaged twice the rate of inflation for over 40 years (College Board, 2006).

It remains an open question whether the advent of new pedagogies made possible by online instruction can increase the productivity of instruction within higher education and begin to move institutions out of this handcraft, stagnant sector. The larger question is whether increasing productivity within higher education in this way is a goal to be desired.

#### *Cost structures in Higher Education*

Economists seek to assess not only the potential productivity of an organization, but cost structures as well. The concept of “cost” in higher education can vary greatly depending on the perspective of the analysis. Adams, Hankins and Schroeder (1978) note that “cost can be thought of in a financial accounting (reporting) sense, a cost accounting (managerial) sense, and an economic (somewhat theoretical) sense” (p. 13). Each of these perspectives contributes to the language of the analysis. For example, from an accounting perspective, costs may be “real” or they may be constructs used in financial reporting such as replacement costs and depreciation. In the economic sense, costs may be micro (i.e., institutional), macro



(i.e., societal) or individual (i.e., student) (Lewis & Dunder, 2001). Determining which costs to study and how those costs are measured become fundamental to any analysis.

In his important work, *The Costs of Higher Education* (1980), Howard Bowen asserts his “revenue theory of costs” in which he states that the single most important determining factor related to the educational cost-per-student is the amount of revenue available to the institution. While this sounds at once obvious and circular, he notes, “[t]his statement is more than a tautology. It expresses the fundamental fact that unit cost is determined by hard dollars of revenue and only indirectly and remotely by consideration of need, technology, efficiency, and market wages and prices” (p. 19). In other words, the level of expenditures on the educational mission of an institution is primarily determined by the amount of funds at hand. Bowen stresses, however, that in an economic sense this is a short-run theory and may not have long-run consequences.

There may well be, however, a long-term component to this theory. According to the Commonfund Institute (the organization now responsible for compiling and publishing the Higher Education Price Index, or HEPI, a measure of inflation in higher education), the rate of increase in expenditures by colleges and universities has risen faster than the rate of increase in the commensurate Consumer Price Index. This has held true with only a few exceptions for every year since 1961 when the HEPI was first devised (Commonfund Institute, 2006). Regardless of the category of expenditures tracked, this phenomenon can be seen in the aggregate for colleges and universities. Expenditures-per-student, which is sometimes used as a

proxy for institutional quality, most notably as a factor in the annual *U.S. News and World Report* rankings, show a similar rate of long-term increase. It is worth noting, however, that analyses of expenditures-per-student over time show that this increase is not constant. Rather, “the increase...has occurred in episodes of very rapid change interspersed with eras of little change” (Getz & Siegfried, 1991, p. 359).

A recent paper by Robert Archibald and David Feldman sought to determine whether Baumol’s “cost disease” theory or Bowen’s “revenue theory of costs” was a more appropriate explanation of steadily increasing costs within higher education. Using time series data of consumer prices since 1949, they are able to conclude that, “The data are clearly telling us that the cost disease phenomenon is the dominant reason that higher education costs have risen in such a sustained manner over the past 80 years” (Archibald & Feldman, 2008, p. 289). Understanding the cause of increasing costs lies in the fundamental difficulty of increasing productivity in the learning enterprise begins to explain the interest in online courses and programs on the part of administrators.

Prior to the Second World War, Henry Beaumont wrote in the *Journal of Higher Education* about his attempt to attribute costs to individual units within an institution. His innovation involved moving beyond the basic analysis of “total salary budget/total student credit-hour production,” and analyzing data by level of student and level of faculty (Beaumont, 1941). Forty years after Beaumont conducted his analysis, a similar article appeared in the same journal which looked at “*Factors affecting instructional costs at major research universities*” (Brinkman, 1981). Brinkman assessed a number of variables, on both the input and output sides

of the equation, using linear regression to determine which variables have the largest impact on costs. For the purposes of his study, input variables were faculty-student ratios, county per capita income, average faculty compensation, and staff-student ratio. Output variables were curriculum diversity, graduate student proportion, total FTE enrollment, and research emphasis. Not surprisingly, faculty-student ratios were the most highly correlated to instructional costs on the input side. The output side, as he noted, is less straightforward because there are no directly attributable expenditures made to the outputs of higher education. The most highly correlated variable for the output side was “curriculum diversity,” which Brinkman defined as the number of degree programs divided by the total FTE enrollment. Another way to categorize these highly correlated variables in his 1981 study would be to refer to them as mission-specific variables. Faculty costs, curriculum diversity, the presence of graduate students, total FTE enrollment, research emphasis as well as faculty-student ratio and staff-student ratios are functions of the size and mission of the institution. In other words the small, locally focused, primarily undergraduate institutions have a fundamentally different set of costs than do the large, research-intensive institutions.

The connection between institutional mission and cost-structure is amplified in a 2003 report from the National Center for Education Statistics entitled, “A Study of Higher Education Instructional Expenditures: The Delaware Study of Instructional Costs and Productivity” (Middaugh, Graham, & Shahid, 2003). This large multi-year study looked at direct instructional costs per student credit hour taught within four-year institutions. Not unlike the 1981 Brinkman study, the authors found that

the primary variable in accounting for the variance in instructional cost between institutions is disciplinary mix. The secondary variable was determined to be mission, as represented by Carnegie classification. The authors found that the most significant specific variables regarding costs were volume of institutional teaching activity, department size, proportion of faculty holding tenure, and the presence of graduate instruction. Interestingly, they also found that, “[t]he extent to which expense is associated with personnel costs, as opposed to equipment costs, has less impact on total direct instructional expenditures within a discipline than do teaching volume, department size and tenure rate” (p. xi). Thus mission, as represented by volume, size, and curricular mix is a more direct predictor of instructional cost than is the presence or absence of technology or the overall compensation rate of the faculty.

### *Accounting in Higher Education*

As previously noted, the economic conception of “costs” should be considered a different entity than the accounting concept of “cost.” The former considers the value of things foregone (i.e., “opportunity costs”), while the latter is concerned only with indicating book value (or future or present value) in dollar terms. While both conceptions are important, for the purpose of this study, how individual costs are accounted for will be critical.

How costs are recorded and reported can have real and lasting effects on an institution. In lieu of other common management information, the budget and its costs become a critical document for policy-makers. Indeed, one of the most

common complaints from state and federal legislators regarding public higher education is the difficulty they have in knowing how institutions spend their money and, more directly, how changes in expenditures may or may not affect student outcomes. Dickeson notes that most factors which contribute to steadily rising costs within higher education are hidden from public view (2006). This opacity of financial structure, combined with the limited utility of college and university financial reporting, contribute to the difficulty encountered by researchers.

Over the years several different methods have been used in attempts to capture costs within colleges and universities in some systematic way. Individual institutions have adopted various systems with differing levels of success. The systems each have strengths and weaknesses – the challenge is to find the proper balance between explanatory strength, complexity and labor-intensity. Individualized internal accounting systems should provide college leadership with useful decision-making data. Researchers interested in inter-institutional comparisons are handicapped by this patchwork of internal data. Instead of a common standard for cost accounting, federally mandated financial reports and published institutional budgets become the *de facto* sources of consistent data, and in general, these reports lack sufficient cost data to enable policy-making.

In the 1980s the idea of responsibility-center management/budgeting emerged from the business arena and made inroads into colleges and universities. In responsibility-center management, costs and outcomes are allocated to the smallest applicable unit (college, department, faculty) (Lang, 2001). This budgeting and management technique does not, however, adequately solve one of the critical issues

underlying higher education accounting: how to accurately determine the costs of the various processes that take place within the college. The allocation of overhead and indirect costs presents significant problems to the consistent application of most costing methodologies.

Unit cost determination is only one of many possible ways to classify expenditure data. The Governmental Accounting Standards Board (GASB) is an organization which “establishes and improves standards of accounting and financial reporting for U.S. state and local governments” (“Facts about GASB,” 2008). GASB suggests several methods of expenditure classification -- by fund; by organizational unit; by function or program; by activity; by character, such as “current,” “capital,” “debt service,” etc.; or by object classification. Most college and universities use a combination of these methods (Granof, 2007).

To further complicate matters regarding financial reporting, institutions must report according to two separate sets of standards because there are different entities which determine the standards for public and private institutions. GASB, as noted above, is responsible for setting standards used by public institutions while the Financial Accounting Standards Board (FASB) sets the standards for use by private, non-profit institutions. The differences in standards are numerous and while most are subtle, the net effect is to prohibit easy side-by-side comparisons between GASB and FASB institutions (Goldstein & Menditto, 2005). When assessing the costs behind the instructional mission of the university, however, more difficulties are encountered. Primary among these is the multi-product nature of a public institution, which typically encompasses not

only instruction but research and public service or outreach as well. The mix of disciplines and multiple levels of instruction offered (remedial, undergraduate, graduate) create further complications when determining cost structures. Each of these disparate missions and levels entails different costs and yet many of the same resources (notably faculty) are required. It thus becomes problematic to parse out which costs should be attributed to what activities. For example, cost attribution of an hour of a faculty member's time to either an instructional or research category is not easily accomplished. In fact, there is significant "complementarity" across those two roles. As Hammermesh (2005) points out, direct benefits may accrue to the instructional role specifically because of research being conducted, and "[t]hese complementarities make research and instruction joint products and justify their joint funding because they are produced more efficiently when produced together" (p. 8).

In the business world, the process known as activity-based costing, or ABC, has proven to be a powerful management tool. The key advantage of ABC over other costing methodologies is that "it allocates 'overhead' costs to programs and activities in a way that is more reflective of the factors that influence them" (Granof, Platt, & Vaysman, 2000, p. 14). Overhead costs can be defined as those costs not directly attributable to a specific function within an organization, but which are requisite to the organization as a whole. The following table highlights the differences in method and outcome between ABC and traditional costing methods.

Table 2: Activity-based Costing vs. Traditional Costing

	ABC Costing	Traditional Costing
Cost Pools	ABC systems accumulate costs into <i>activity</i> cost pools. These are designed to correspond to the major activities or business processes. By design, the costs in each cost pool are largely caused by a single factor – the <i>cost driver</i> .	Traditional costing systems accumulate costs into facility-wide or departmental cost pools. The costs in each cost pool are heterogeneous – they are costs of many major processes and generally are not cause caused by a single factor.
Allocation Bases	ABC systems allocate costs to products, services, and other cost objects from the activity cost pools using allocation bases corresponding to cost drivers of activity costs.	Traditional systems allocate costs to products using volume-based allocation bases: units, direct labor input, machine hours, revenue dollars.
Hierarchy of Costs	Allows for non-linearity of costs within the organization by explicitly recognizing that some costs are not caused by the number of units produced.	Generally estimates all of the costs of an organization as being driven by the volume of product or service delivered.
Cost Objects	Focuses on estimating the costs of many cost objects of interest: units batches, product lines, business processes, customers, and suppliers.	Focuses on estimating the cost of a single cost object – unit of product or service.
Decision Support	Because of the ability to align allocation bases with cost drivers, provides more accurate information to support managerial decisions.	Because of the inability to align allocation bases with cost drivers, lead to <i>overcosting</i> and <i>undercosting</i> problems.
Cost Control	By providing summary costs of organizational activities, ABC allows for prioritization of cost-management efforts.	Cost control is viewed as a departmental exercise rather than a cross-functional effort.
Cost	Relatively expensive to implement and maintain.	Inexpensive to implement and maintain.

(Granof et al., 2000, p. 9)



Beyond simply deriving cost structures, ABC can become a useful management tool by allowing decisions regarding various functions to be driven with appropriate cost data. There have been several studies that have used ABC to analyze cost structures within a university setting (Cook, 2003; Evans, 2004; Rooney, Borden, & Thomas, 1999, et. al). These studies produce interesting results, but are somewhat constrained by their initial assumptions or level of analysis. For example, the decision concerning which costs get allocated into specific cost drivers has an impact on how those activity-based costs are reported. Depending on the unit of analysis, these studies derive divergent conclusions.

In the aggregate, it is clear that colleges and universities are not well suited to the ABC approach to costing (nor, for that matter, any other approach to cost attribution). As mentioned previously, some of the recognized difficulties include the multi-mission and multi-product nature of the enterprise. Others include the relatively loose employment relations which faculty have with the institution, the fund accounting systems that universities employ, a lack of well-defined objectives or measurable outcomes, and the fact that capacity constraints of universities are not clearly discernable (Granof et al., 2000).

From a theoretical standpoint, activity based costing (ABC) can provide the most detailed level of cost identification and allocation within the enterprise. Unlike the manufacturing world where ABC originated, higher education entails activities which accrue benefits to multiple products.

...cost drivers are more difficult to identify in universities and consequently activity based costing is not appropriate in universities.

...the activities of universities are, at the macro level, reasonably narrow (teaching, research, and other). However, in detail these activities become complex and interwoven which may render the identification of cost drivers for individual activities more difficult (Broad & Crowther, 2000, p. 5).

These obstacles have proven large enough to limit the use of ABC in colleges and universities. William F. Massy (2003), however, provides a useful distinction regarding ABC and offers some encouragement regarding its use. He seeks to separate the use of “enterprise ABC” as separate from “analytic ABC”:

Activity-based costing comes in two flavors, only one of which currently appears practical for broad application in colleges and universities.

“Analytic ABC” addresses the activities and costs of individual processes...It’s not necessary to analyze all the organization’s processes, just the ones that need attention immediately. In other words, analytic ABC takes a decision support rather than an accounting orientation. It requires just enough data to model the target process, not data for the enterprise as a whole. “Enterprise ABC,” on the other hand, looks at all the organization’s activities (pp. 253-254).

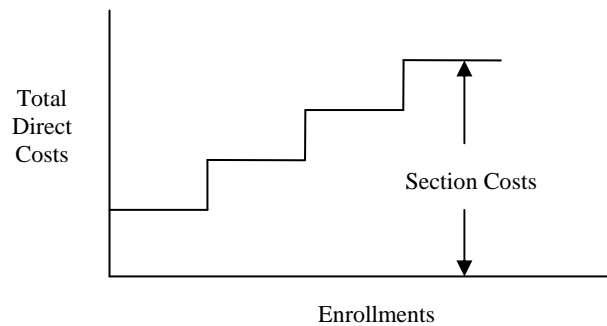
Despite the acknowledged difficulties in using ABC in the enterprise of higher education, and for even more specific analytical use, allocating costs by activity is conceptually still the most promising method for deriving a true cost picture. The non-standard nature of most ABC-derived studies causes problems for inter-institutional comparisons. How costs are allocated across multiple and joint

activities can vary widely. Winston (2000) characterizes this as “the most difficult problem facing the generation of meaningful estimates of the cost of undergraduate education in a university, and it is the problem most in need of coordination of methodologies and assumptions among schools if their results are to be comparable” (p. 43).

Recognizing the need for standard inter-institutional definitions of cost categories, the Technology Costing Methodology (TCM) Project (Jones & Poulin, 1998) is an attempt to integrate aspects of ABC into a consistent and useful institutional decision-making tool focused on the various alternative means of delivering courses via modes such as videoconference, remote sites, and online. The expressed objectives of the project are to present a costing methodology to enable cost comparisons across delivery modes for intra-institutional uses, and to propose a set of procedures which would allow for inter-institutional cost comparisons (Jones, 2004).

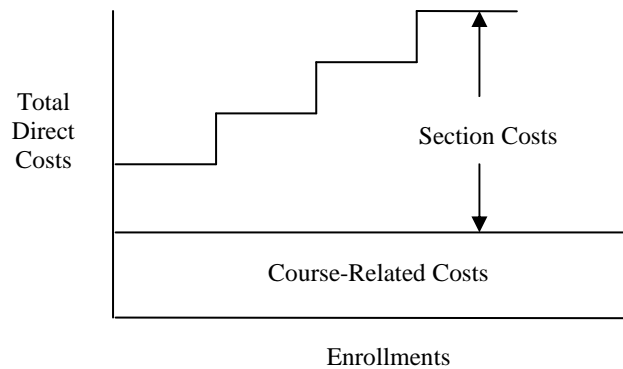
The TCM Project Handbook presents a set of standard figures highlighting the relationship between cost and enrollment. Figure 1 represents the traditional conceptual cost model which shows that as enrollments increase additional course sections must be added. This is most applicable to face-to-face courses for which direct course-related costs are low, and costs are most directly associated with enrollments.

Figure 1: Traditional Cost Model



Frequently, however, costs are incurred before the first enrollment is registered. When significant direct course related costs are incurred, such as during the development of an online course, a more appropriate cost model is shown in Figure 2.

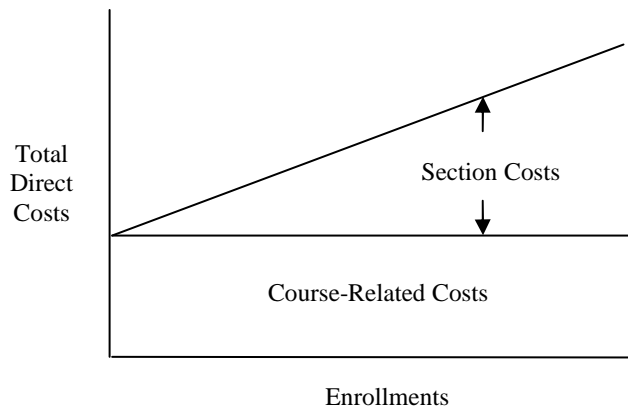
Figure 2: Cost Model with Direct Costs



Some online courses are designed for delivery to large enrollments. For example, the British and New Zealand Open Universities use a “build once/deliver many” model which focuses on high-cost, high-quality, high-enrollment courses. These courses in some sense substitute faculty-student interaction with very high quality, high cost content (OECD, 2005). In these instances, where the  $n$ th student

would simply be added to a very large section, the cost of educating that student is simply added on, and the following cost concept holds:

*Figure 3: Potential Online Cost Model*



The TCM model does embrace elements of ABC, but restricts the analysis to categories of curriculum planning/course design, instructional materials development/production/ acquisition, course content delivery, tutoring/mentoring/interaction with students, and assessment of learning (including assignment of grades) (Jones, 2004, p. 12).

#### *Direct versus Indirect Costs*

The TCM Project explicitly restricts its analysis to the direct costs of instruction and excludes indirect costs. This restriction is undertaken in order to simplify the data collection and allocation process. For the purposes of comparing face-to-face with online delivery of courses, however, this produces a significant under-reporting of the costs associated with classroom instruction. Indirect costs are those that are requisite to the mission of the institution, yet not directly attributable to

an enrollment, a student, a course or a program. In full-cost analyses this includes an apportionment of costs associated with the research and public service missions of a university. In all cases, indirect costs include administrative costs as well as costs associated with the operation and maintenance of the institution's physical plant.

In the most sophisticated cost models, the indirect capital costs and opportunity costs are explicitly integrated as well. Winston (2000) makes a very strong case for the inclusion of such costs, as he argues that the exclusion of such costs cause misleading conclusions. The full cost method Winston puts forth incorporates both direct and indirect measures and includes capital and opportunity costs. Table 3 represents Winston's "annotated formula for cost per student." This table has appeared in the final report of the National Commission on the Cost of Higher Education (NCCHE) as well as in the National Center for Education Statistics Study of Higher Education Instructional Expenditures, known as the Delaware Study. Winston's use of the 2.5% depreciation rate is a fairly standard rate. His use of the 9.12% opportunity cost figure is based on the cost of capital available at the time the model was published and was based on a 20-year average return of 30 year Treasury Bills.

Table 3: Winston's Full Cost Model

<b>Cost =</b>		
<b>Clearly Instruction</b>	+ <b>Proportion partially instruction</b>	+ <b>Proportion capital costs</b>
Current expenditures on: <i>Instruction</i> <i>Student Services</i>	Current expenditures on: <i>Academic support</i> <i>Institutional support</i> <i>Operation of physical plant</i>	Depreciation (2.5%): <i>Replacement value of buildings</i> <i>Replacement value of equipment</i>  <b>Plus</b>  Opportunity cost (9.12%): <i>Replacement value of buildings</i> <i>Replacement value of equipment</i> <i>Replacement value of land</i>
	<b>Where proportion equals</b> Current expenditures on instruction and student services divided by Total current fund expenditures less: current expenditures on academic support, institutional support, operation of physical plant, scholarships and fellowships, mandatory and non-mandatory transfers	
<b>Cost per student =</b> Cost divided by full-time-equivalent enrollment		

(As cited in Harvey, Williams, Kirshstein, O'Malley, & Wellman, 1998; Middaugh et al., 2003)

### *Decision-making in Colleges and Universities*

In seeking to determine the role which cost plays in institutional decision making, it is worth exploring the literature of organizational studies. Just as the literature of economics and cost accounting highlight the non-standard nature of the enterprise of higher education, the field of organizational behavior treats higher education as its own special case. Many of the theories and studies performed in classic business or manufacturing environments simply do not apply well to higher

education. Classical organization structure is defined by the principles of division of labor, unity of direction, centralization of authority, authority and responsibility, and unity of command, (Donnelly, Gibson, & Ivancevich, 1995, p. 247). Yet, when one imagines the organizational characteristics of a college or university, these would not be the primary principles in evidence, as most are characterized by shared governance and multiple, diffuse missions.

The way decisions are made within higher education is itself an interesting field of study. Perhaps one of the most well known theories regarding academic governance and decision-making is the “garbage can model” put forth by Cohen, March, and Olsen in 1972. In this theory, there are three interrelated “streams” of variables which co-mingle to produce a diverse set of decisions: a stream of problems, a rate of flow of solutions, and a stream of energy from a fluid number of participants. The crucible, or garbage can, into which these streams mingle produces a set of choice opportunities. The authors state that this model of decision making is particularly descriptive for colleges and universities,

One class of organizations which faces decision situations involving unclear goals, unclear technology, and fluid participation is the modern college or university. University decision making frequently does not resolve problems. Choices are often made by flight or oversight.

University decision processes are sensitive to increases in load...Important choices are not likely to solve problems. (M. D. Cohen, March, & Olsen, 1972, p. 11)



In his work, *How Colleges Work*, Birnbaum integrates the idea of the garbage can, along with several other classical organizational theories to describe the process by which colleges are organized. He terms his study “cybernetic” to capture the functional feedback mechanisms that drive decision making, (1988). His is a useful view of not only how colleges and universities are structured, but he provides some insight into the disjointed nature of internal information flows inherent in the environment.

An interesting paper by Bourgeois and Nizet characterize the means by which decision-making in academia can be influenced. They first posit two basic modes of influence: pressure, which is the ability of an influencer to control or withhold a resource needed by the decision-maker; and legitimation, which is a process by which the influencer can make his or her position seem legitimate, usually by linking to the decision-makers norms and values. The authors then cross reference a list of “seven organizational resources that could be involved in the exercise of power in organizations: expertise, monetary resources, information, time, rules, coalitions, and language and symbols,” (Bourgeois & Nizet, 1993, p. 390). Their paper concludes with a case study showing how some of these pressure and legitimation process can be seen in action. Drawn from a Belgian university, the case study has echoes for this paper in that it describes the initiation of a non-traditional program of study within a very traditional university.

Rowley and Sherman classify decision making strategies quite simply as either top-down, bottom-up, or consensus. Top-down decision making are “those that strictly follow lines of power and responsibility,” while in bottom-up decision

making, “people throughout the organization bring forward ideas, opinions, and potential actions in a sense of camaraderie and empowerment,” (2001, pp. 159-160). Consensus driven decision-making, on the other hand, is a hallmark of classically described shared governance within academia. Shared governance is a philosophy that places emphasis on decision-making by consensus across campus administration and faculty. The American Association of University Professors is perhaps the most vocal proponent of shared governance and put forth a call, in its 1966 Statement on Government of Colleges and Universities, toward “joint effort” regarding governance of institutions and recognized the importance of communications among faculty, staff, administration, and students, (“Statement on Government of Colleges and Universities,” 1966).

The idea of shared governance is a manifestation of the unique relationship which college faculty members have with their respective institutions. Colleges and universities are not so much managed by administrators as they “have governance,” (Fish, 2007, p. 10). In this subtle distinction lies a host of issues which have direct impact on the way decisions are made. As external pressures increase on governing boards and presidents to demonstrate accountability and cost efficiency, some of the basic tenets of shared governance are being eroded. This is a point of view shared by Birnbaum, (2003) and Waugh, (2003).

In fact, in his paper, Waugh makes some points which are particularly salient given the topic of this study. He understands but laments the increasing “professionalization” of academic administration, and highlights where the administrative and academic cultures come in conflict.

Administrative values may also conflict with academic values. Because budgets so often are driven by credit-hour generation, encouraging the enrollment of more students in more classes makes perfect administrative sense. However, the weakening of standards to boost enrollments makes little academic sense unless the institutional leadership is consciously choosing to reduce the quality of its programs, (2003, p. 90).

Waugh also states as a given one of the underlying premises this study seeks to clarify, namely that, “[Administrative] decision makers tend to give numerical information, especially dollar amounts, more weight than qualitative information,” (2003, p. 93). Whether this stereotype holds true remains to be seen.

The chief academic officers of a university (Provost, Vice-President for Academic Affairs, etc.) are charged with bridging the two realms of academic and administrative values. To the greatest extent possible, they must be able to maintain legitimacy among the faculty while crafting decisions which are accountable to the president, the board of trustees and other stakeholders. This is a difficult task. Meanwhile the chief business officer is firmly entrenched in administrative culture, typically as a result of a non-academic career path. This point was made in a 1964 paper by Etzioni, entitled *Administrative and Professional Authority*, reprinted in 2000.

The culture clash between academic and administrative decision makers can be seen as the product of external calls for accountability and the ever-increasing size of academic institutions. Clark Kerr highlighted this outcome in 1963:

The general rule is that the administration everywhere becomes, by force of circumstances if not by choice, a more prominent feature of the university. As the institution becomes larger, administration becomes more formalized and separated as a distinct function; as the institution become more complex, the role of administration becomes more central in integrating it; as it becomes more related to the once external world, the administration assumes the burdens of these relationships. The managerial revolution has been going on also in the university, (2001, pp. 21-22)

#### *Literature from Online Educators*

Perhaps there is no better place to investigate pertinent literature than from those who are practitioners in the field of online distance education. Web delivered online instruction is now just over ten years old. From the outset it seemed to stir imaginations and many institutions began to experiment with delivering courses online as early as 1997. From those early efforts, a body of literature began to emerge. Initial research was focused on those skeptics who worried about the quality of the online experience or the potential for student cheating. As online programs have become more mainstream and have moved closer to the academic center of the university, there has been a focus on the elements of cost and efficiencies as opposed to quality and integrity.

It is generally acknowledged that the creation of quality online courses entails higher cost than the creation of an analogous course for delivery via traditional

“face-to-face” instruction. The reasons for this cost differential are several and include the need for a robust technological infrastructure as well as specific quality measures, many of which are non-existent in the face-to-face environment. Also included is the requirement to “unbundle” the traditional role of the faculty from that of individual artisan to a division of labor in order to support both the production and the delivery of online courses (Paulson, 2002). This is an important point because in order to create a quality online course, a new and diverse set of skills is needed. These are skills beyond the portfolio of the average faculty member and may include the production of multimedia learning objects, instructional design elements, and familiarity with course management software. Recall the productivity argument put forth by Baumol (1996), and the role that “handiwork” played in the creation of a stagnant productivity curve. The requisite unbundling of the faculty role, while certainly increasing the costs related to development of a course, may also become a key to increasing faculty productivity.

If there is a general acknowledgement regarding higher development costs for online courses, there is far less consensus regarding the underlying costs of delivering those courses. Meyer (2006), builds on the earlier work of Rumble (2001, 2004) by categorizing costs related to online instruction as having three major categories, each with sub categories. The major categories of development, delivery, and administration echo, in part, other cost determination schema such as WCET’s Technology Costing Methodology noted above, the Marshall University costing project, and the Flashlight project.

The Marshall University costing project is noteworthy as an early attempt to capture both development and delivery costs for online courses. The study first looked at the known costs for development of courses (including software, training, supplies, instructional technology support, and the stipend paid to faculty,) then tried to capture “hidden costs” of things like office space, administration, and help desk support as well as the teaching stipend paid to faculty. In the end, the study showed that Marshall lost nearly \$170,000 in offering online courses once the costs were tallied and associated revenue incorporated into the calculation, (Morgan, 2000, p. 22). A larger survey-based instrument was developed using the same taxonomy and methodology and made available for self-reporting of costs which were then plugged into a calculator.

The Flashlight project is a product of the TLT group, a non-profit consultancy. It uses a similar set of categories to capture costs as the Marshall project, and includes an ABC-style self-reporting for faculty time and effort. They have made three early case studies available through their website, but those are now fairly dated. They allocate costs into activity type, (preparation, presentation, interaction, assessment, practice, evaluation) and by role, (faculty, staff, other), ("The Flashlight Program," 2007). It is interesting to note that the Flashlight case studies present costs as allocated over semester credit hour in a similar fashion as presented in this research.

The most comprehensive set of cost categories can be found in the work of Rumble, who approaches the subject of costs from his work at the United Kingdom's Open University. Meyer (2006), building on Rumble's earlier cost categorization,

presents the following elements of development costs, delivery costs and administrative costs.

*Table 4: Development Costs*

<b>Expenditure</b>	<b>Description</b>
Materials	Includes course syllabus or outline, textbooks, texts with web-based content, reference materials, images, audio, video, simulations, virtual reality
Staffing	Includes instructional design, content development, text authoring, software development, multimedia design and production, course-specific software development, content integration and testing, posttest modification, and training
Staff equipment	Computers and software, provided by the institution or staff
Staff expenses	
Copyright clearance	Direct negotiations or outsourced
Materials production	Text, audio, video, graphics, and software production, including staff time and supplies
Annual revision of materials	New assignments, examination questions
Developmental testing	Payments to course testers, general running costs of developmental testing

(Meyer, 2006, p. 21)

*Table 5: Delivery Costs*

<b>Expenditure</b>	<b>Description</b>
Materials delivery	Postage, courier, and so on resulting from the distribution of physical goods
Materials reception expense	Expenses incurred by students, including the cost of receiving materials and printing them or purchasing materials
Student/instructor equipment	Network charges, computers, printers, and software for both students and instructors
Student/instructors expenses	Payments to Internet service provider or connection charges for time online; increased energy costs, insurance for equipment, and equipment repair
Cost of student time	Opportunity cost for students who could be doing paid work instead of classwork, also applies to employers and other self-employment
Instructor time	Tuition varies whether full-time or part-time staff teach a course and how much time instruction requires from the instructor
Student/instructor helpdesk	Staffing a helpdesk for both students and instructors for help with routine technical questions
Call costs	Toll free access to the helpdesk or other support functions

(Meyer, 2006, p. 26)

Table 6: Costs of Administration

<b>Expenditure</b>	<b>Description</b>
Decision making	Includes development of an IT or distance learning or online learning strategy
Expenses related to high-level decision making	Includes travel to study other institutions, costs of consultants to help advise the institution on its online learning planning
Institutional evaluation and quality assurance	Includes staff time and expenses such as survey costs, report production, and dissemination
Web site development costs	Includes staff time and Internet specialists, graphics designer, Internet designer
Web site development support	Includes staff computers, software, and repair for individuals devoted to web site development
Web site implementation	Includes portion of network services and maintenance as well as domain name registration
Learning platform software or course management system	Includes cost of purchase or licensing fees and costs to upgrade equipment
Learning platform or course management system equipment and costs	Includes network server, network costs, and access to the Internet, which increases with enrollment and course offered
Buildings and accommodation capital costs	Includes purchase of land, construction of new building, purchase of existing building, refurbishment of existing building, rental of offices; costs depend on number of staff to be housed
Buildings and accommodation operating costs	Includes taxes paid; insurance, heat light, water, power, waste disposal telephone, fax, repairs and maintenance; grounds and gardens, security, cleaning, and supervision of these activities
Intranet costs	Includes computers, installing network connections, servers, and server software, and other software
Intranet start-up costs	Includes design consultants or in-house designer and technical support staff, training costs
Intranet ongoing costs	Includes editorial and design staff, technical personnel, ongoing consultants, promotion, training, and maintenance of applications
Furniture	Includes dedicated staff workstations and shared workstations
Local training center	Includes accommodation costs, equipment (server, computers, printers, photocopier, telephone), furnishing (desks, chairs, storage cupboards, shelving), wiring, and Internet access
Local training center staffing and consumables	Includes staff time and benefits; paper, printer cartridges, and so on
Equipment and equipment replacement	Includes insurance and simple depreciation
Digitized courseware and library	Includes cost of purchase, lease, or fee use of digitized content; library support, including staff to create and maintain records; document scanning, indexation and equipment,; maintenance and repair of equipment
Marketing costs and expenses	Includes staff salaries, benefits, and consumables
Shared central costs	Includes cost of staff in human resources, purchasing, financial management, accounting, auditing, et cetera

(Meyer, 2006, p. 28-29)



Clearly not all of these cost categories apply to all organizations offering online courses. It is also important to note that many of these cost components are also present in the development, delivery, and administration of traditional classroom instruction. There may well be as much instructor time spent in the planning of a traditional course as in developing an online course. Certainly, there are institutional evaluation and quality assurance costs to be borne regardless of delivery model. Direct physical plant costs are evident in the development of both online and face-to-face courses, but are significantly reduced during the delivery of online courses and increased during classroom instruction.

In discussing these various cost categories, Meyer points out that, as previously noted, developing online courses is more expensive than developing an analogous course for classroom delivery. The delivery costs are where she believes significant cost efficiencies will be evident:

...it is during the delivery of the online course or program that the higher investment in development begins to pay off. It does so through three mechanisms. First technology and intelligent instructional design can substitute for higher cost labor (the substitution of capital for labor), and second, they can also aid in the substitution of lower-cost labor for higher-cost labor...In other words, the lower cost of delivery results from decisions made about how faculty time would best be used. The third mechanism [is related to the fact that] online learning can be more scalable (Meyer, 2006, p. 27).

These three potential cost advantages of online courses -- using technology to substitute for labor, enabling the substitution of low-cost labor for high-cost labor, and scalability – are testable claims. Scalability in this context refers to the ability to increase enrollment in a class without commensurately increasing costs or reducing quality. To the extent that these costs will manifest themselves in institutional financial data, they are directly pertinent to the study proposed in this document.

The list of categories associated with administration is broad and encompasses what normally would be thought of as “overhead.” Yet there are additional and specialized tasks that an administrative unit will be required to undertake to support online learning (such as supporting the specialized software, handling the unique needs of distant students, management of intellectual property and copyright issues, and ensuring course accessibility.).

### *Measures of Worth*

Sometimes lost in the broad discussion of cost effectiveness analysis is a necessary focus on increasing outcomes rather than reducing costs. Jung (2003) states succinctly that “cost effectiveness of online education can be achieved either by reducing the costs or improving the effectiveness of online education” (p. 722). Measuring the benefits or outcomes of online learning becomes its own problematic proposition when many of the touted measures are extremely difficult to quantify. Cohen and Nachmias (2006) attempt to quantify the benefit side of the equation by using parameters such as efficiency improvements, (saving time, saving printing

costs, saving room costs, saving lab equipment), quality improvements, (accuracy in checking test, immediate feedback, knowledge representation richness and variety, activity quality), and affective improvement (interaction improvements, boosting interest, enhancing prestige). Clearly some of these factors lend themselves to quantification more readily than others.

Ehrmann (2002) posits three distinct questions which any benefits analysis should answer:

1. Are the program's outcomes intended to be the same of all its beneficiaries? If not, how can you assess them?
2. To help design assessment procedures, how can we be more specific than merely saying that the technology is meant to cause 'better educational outcomes?'
3. What kinds of data about benefits might help the people running the program to improve those benefits (paralleling the way that activity based cost data ought to be able to help policy makers control cost)? (p. 2)

In common parlance, there are three common terms used to measure the balance between costs and outputs: cost-efficiency, cost-effectiveness, and cost-benefit. While sometimes used interchangeably, they in fact are different analyses. All may be appropriate under given circumstances, but deciding the scope of the analysis will determine which measure to use.

*Cost-efficiency.* "Efficiency is the ratio of output to input. A system is cost efficient if, relative to another system, its outputs cost less per unit of input" (Rumble, 2004, p. 120). This is perhaps the narrowest of the three measures. It is a

ratio whose denominator will be in measurable units: semester credit hours, student FTE, enrollments, etc. There are two key types of cost-efficiency measures: technical and allocative. Technical efficiency generally describes how well institutions minimize the use of their physical inputs. Allocative efficiency is a measure of how well the institution minimizes costs (Salerno, 2002).

*Cost-effectiveness.* “Effectiveness is concerned with outputs. An organization is effective to the extent that it produces outputs that are relevant to the needs and demands of its clients. This implies the existence of criteria by which the organization’s success in this respect can be measured” (Rumble, 2004, p. 161). Given this focus on the relevance of the outputs, it should be noted that a system can be very cost-efficient, but if it is not producing outputs that are relevant to the consumer, then it will not be cost-effective. For example, if an institution can provide highly cost-efficient instruction in Mandarin Chinese, but the population is seeking instruction in Spanish, then the Chinese program is not cost-effective.

*Cost benefit.* The broadest of the three terms, cost benefit, “seeks to measure in economic terms the benefits of education to individual and society” (Rumble, 2004, p. 181). Rumble further notes that the two most common measures of cost benefit within education are the private rate of return to the individual and the rate of return to society as a whole. This is a restatement of the “who benefits and who pays?” dilemma. Discussions of rate of return are grounded in rational economic theory and are attempts to justify answers to the question of who should pay for higher education by examining to whom benefits of education accrue.

Selection of the type of analysis (cost-efficiency, cost-effectiveness, or cost benefit) will determine what is measured and how broadly the results can be extrapolated. The challenge is to discover whether there are cost-efficiencies that are enabled by online instruction. Or whether, as Johnstone asserted "...technology will mainly enable more and better, not cheaper, learning" (1999, p. 14) .

The field of study surrounding online delivery of college courses is only about ten years old. Yet there is a steady stream of research being produced. Much of this research is focused on the pedagogical practices and measurement of student outcomes of online courses when compared to traditional face-to-face instruction. The study of the underlying costs related to the delivery of online course is less robust and must include a review of the literature of accounting and economics as well as from the field of online practitioners.

Each of the areas examined in the preceding literature review contributed in some fashion to the formulation of this study. Accounting and economics informed the quantitative aspects while the decision and practitioner literature informed the qualitative aspects thus forming a solid foundation for study undertaken.

## Chapter Three

### *Methodology*

In pursuing the research questions put forth in Chapter One, this study was designed using a mixed methods approach. The mixed method approach is a relatively new entrant in the taxonomy of research methodologies and has been categorized as the “third research community,” (Teddlie & Tashakkori, 2009). It is designed to partner a quantitative approach and a qualitative approach in order to provide a broad-based and cohesive investigation into a given research topic. The mixed methods approach to research typically employs one of two general designs – concurrent or sequential – depending upon whether the two investigations are undertaken simultaneously or one after the other. Most mixed methods implementations are performed sequentially, and there the key question becomes whether the qualitative or quantitative work is performed first. Creswell lays out three sequential strategies which he calls explanatory design, (the quantitative investigation taking place first, then the qualitative, then there is an integration of the two); exploratory design, (the qualitative investigation taking place first, then the quantitative, then the integration of the two); and transformative design, (the two approaches are used sequentially but the order is not critical, and the researcher in this case is more oriented toward vision, advocacy, ideology, and frameworks), (Creswell, 2003, p. 213).

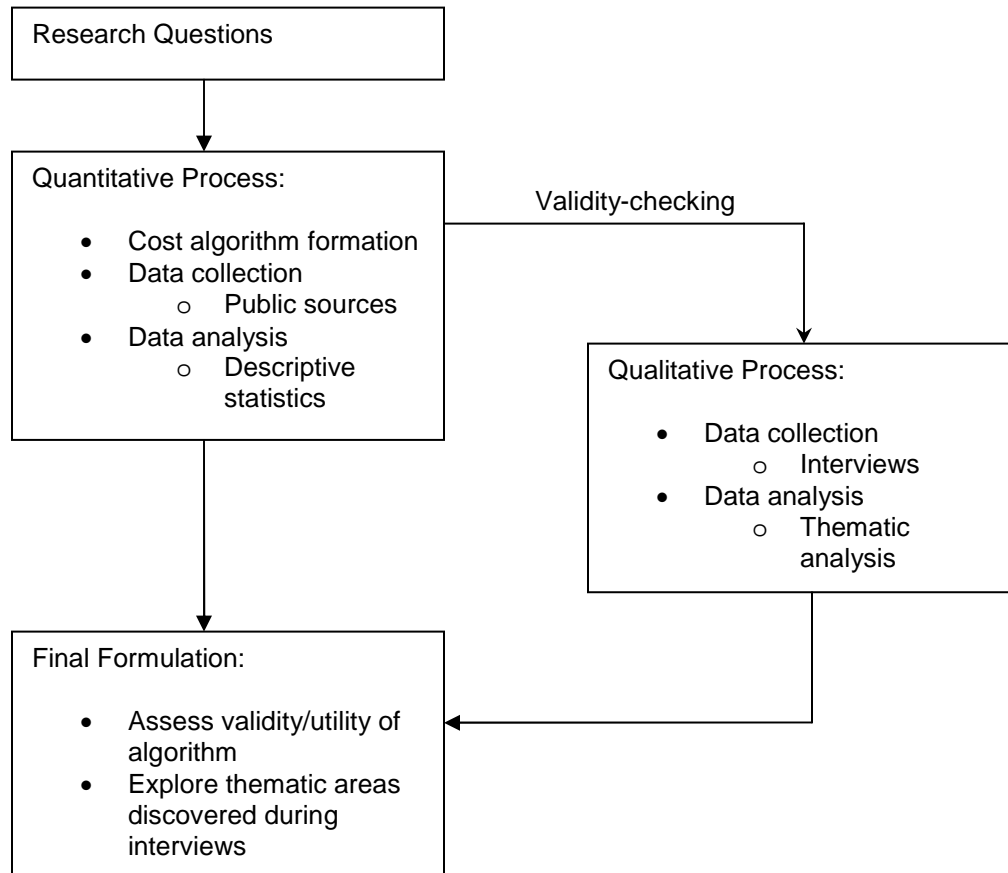
One of the fundamental aspects of a mixed methods approach is the grounding of the research in the classical conception of pragmatism as a way to overcome the apparent chasm between pure qualitative and pure quantitative

approaches, (Johnson & Onwuegbuzie, 2004). Creswell states this pragmatic grounding can be set against other “alternative knowledge claim positions” such as postpositivism, constructivism, and advocacy or participatory. He further associates the following characteristics with a pragmatic approach: problem-centered, pluralistic, there are consequences of actions, and a real-world practice orientation, (2003, p. 6). This set of characteristics is particularly well suited to the research questions at hand. It must be noted that grounding a methodology in pragmatism leaves open certain critiques of the approach. The primary critique leveled at pragmatism, and therefore at Creswell’s philosophical foundation for mixed methods methodology is that pragmatism can easily be rendered impotent in terms of critical force. In some senses, pragmatism, by being problem-centered and real-world focused, is an extremely weak vehicle from which to mount critical theory examinations. It is safe to state that many social science researchers are uncomfortable with a notion of an unchanging truth or a single reality which is shared by all. From this standpoint, many of the methodologies brought to bear in the social sciences are undergirded by a specific perspective or lens, through which the researcher seeks explanatory clarity. Many a researcher feels the need to therefore offer up a paradigm-grounded critique of the social constructs being examined. Those methodologies which lack the ability to mount a forceful critique of social constructs are therefore, in the mind of some social scientists, found to be lacking. This is a point of view, in discussions of research methodology, carried forcefully by Scheurich (1997), and more gracefully by Crotty (1998).

The mixed methods researcher places the research questions in a central role, rather than placing any particular paradigm at the forefront, (Creswell, 2003). Mixed methods research “involves the integration of statistical and thematic data analytic techniques,” and those data are “presented in both narrative and numerical forms,”(Teddlie & Tashakkori, 2009, p. 8). For the study undertaken here, with its focus on exploring delivery costs between online and classroom instruction and the underlying conceptions regarding online costs among campus decision-makers, a pragmatic, mixed-methods approach is not only acceptable but appropriate. A graphic representation of the mixed methods approach employed in this study is found in Figure 4.



Figure 4: Mixed Methods Process Path



### Research Questions

It is worth restating the research questions posed in Chapter One here as they are central focus in this mixed methods approach. RQ1: What role does cost play in the institutional decision to offer an online course in comparison to a face-to-face course? RQ2: What are current best practices relating to cost determination for online course delivery? RQ3: What are the perceptions of campus leaders regarding the delivery costs of online courses in comparison to face-to-face courses?

RQ4: Does the role of cost information in decision-making differ based on the size and mission of the institution?

### *Quantitative Study*

The first part of the study examined cost and space data from seven public Texas universities. In addition, data from one centralized organization whose mission is to support fully online delivery of courses and programs was analyzed in a comparative fashion. The focus was on deriving representative institutional costs required to deliver a traditional classroom course for each institution and then comparing those costs with the costs associated with online delivery from the centralized organization. This study did not examine the amount of effort required by an instructor to deliver a course in each mode. Instructors are typically paid either a salary or on a per-course basis. Neither method factors in the amount of actual effort expended in an instructional activity. Because the cost to the institution of direct instructional activities was assumed to be the same for both online and face-to-face instruction, these costs were excluded from the study.

### *Use of Annual Financial Reports*

In terms of budgets and financial reporting, there has historically been an effective dichotomy between private, not-for-profit institutions which have used the Financial Accounting Standards Board (FASB) rules and public institutions which are covered by the standards of the Government Accounting Standards Board (GASB) rules (Granof, 2007, p. 551). Even with the provision of consistent expenditure categories and guidance, the allocation of specific costs to individual

categories may vary based on individual cost accounting algorithms. This can create problems for any attempt to derive consistent data points regarding costs from multiple institutions. Potential variability among financial reports can be reduced significantly by studying institutions within the same state.

In order to provide consistency in this multi-institutional study, the quantitative analysis focused on data which was publicly available through required financial instruments and other mandated reports. The primary means of acquiring cost elements was through official institutional Annual Financial Reports. While unable to detail costs at the most granular level, these primary financial statements have the distinct advantage of offering consistency of reporting across a variety of institutions. Additionally, because the subjects of this study were all Texas public four-year institutions, they all reported under GASB rules. Given the goal of identifying an institutional cost-per-unit of course delivery, only certain line item financial reporting elements were included in the study. For each institution in the quantitative analysis, specific cost categories were fully allocated to the study, while some other costs required a proportional allocation.

#### *Unit of Analysis*

Selection of the unit of analysis presented some difficulties. In order to derive a consistent unit of “delivered education,” the definition and calculation of that unit must be consistent across the different institutions. Some commonly used units include course section, student full-time-equivalent (FTE), and semester credit hour (SCH).

The focus of this study was to determine if any significant differences exist in the underlying costs of delivering a unit of education via two distinct delivery modalities: traditional classroom instruction and completely online instruction. Therefore, it would seem that the unit with the most common currency would be course section simply because “course” or “class” and “section” are commonly used terms for instructional delivery. However, courses are delivered with a huge variation in enrollment, from perhaps five to 500 students. There is a per-capita cost component to offering any course, and therefore use of course section as a unit of analysis may provide inaccurate or inconsistent results.

Student full time equivalent (FTE) is also problematic. There are marked differences in how student FTE is calculated and reported by institutions. In most cases, while the calculation is based on a “normal” full-time student definition, there are variances in this determination among institutions. Even within a single institution, various methods to calculate FTE may be used. For example, the following description of how FTEs are calculated is from the University of Texas at El Paso:

Numerous methods are available to calculate FTE students... The 15-12-9 method divides the total of all undergraduate credit hours by 15, all masters' credit hours by 12, and all doctoral credit hours by 9. The 12-9-9 method counts the number of students taking a full-time load (12 for undergraduate, 9 for graduate) and adds the full-time equivalent of part-time students, which is determined by dividing the credit hours taken by

each part-time student by the full-time load at that level. ("2007-2008 Interactive Fact Book," 2008).

The final unit is the semester credit hour (SCH). The SCH is calculated and reported by all institutions, regardless of classification. It is determined by multiplying the enrollment in a course by the number of credits for that course. For example, a three credit hour course with an enrollment of 25 students would produce 75 semester credit hours. In Texas, SCH information is collected based on the official census date enrollment (the 12<sup>th</sup> class day in Texas) and is reported to the Texas Higher Education Coordinating Board each semester. In addition, the institutional report of semester credit hour presents a consistent measure of educational production which also accounts for enrollment figures. SCH was chosen as the unit of analysis for this study.

### *Selection of Institutions*

Seven specific public universities in the state of Texas were selected for inclusion in the study. The selection of these institutions allowed systematic collection of primary financial data directly from published annual reports as well as secondary data through the Texas Higher Education Coordinating Board, (THECB).

### *Deriving Cost-per-Unit*

For each of the institutions included in the study, a single number, expressed in dollars and representing cost-per-SCH, was derived using the following formula:

$$\frac{A + B(F)}{S}$$

Where

A = expenditures per annual financial report of items Academic Support, Student Services, Institutional Support;

B = expenditures per annual financial report of Operation and Maintenance of Plant, Major Repair and Rehabilitation of Plant, Depreciation and Amortization;

F = allocation factor derived from institutional space inventory in the form of

$$\frac{\text{Square footage dedicated to instructional purposes}}{\text{Total institutional square footage}}$$

and

S = total annual Semester Credit Hour (SCH) production.

The Annual Financial Report cost categories contained in the algorithm include the following sub-categories of expenditures:

Academic support – Activities that support instruction, research and public service, including libraries, academic computing, museums, central academic administration (dean’s offices), and central personnel for curriculum and course development.

Institutional support – General administrative services, executive management, legal and fiscal operations, public relations and central operations for physical plant.

Student services – Noninstructional, student-related activities such as admissions, registrar services, career counseling, financial aid administration, student organizations and intramural athletics. Costs of recruitment, for instance, are typically embedded within student services.

Plant operation and maintenance – Service and maintenance of the physical plant, grounds and buildings maintenance, utilities, property insurance and similar items.

*(Trends in college spending: Where does the money come from? Where does it go?, 2009, pp. 19-20)*

The “square footage dedicated to instructional purposes” was gathered from the space inventory reporting system maintained by the Texas Higher Education Coordinating Board. The total included the square footage only of rooms which had the following types of purpose-designation: classroom, class laboratory, office, study facilities, stack, etc. The allocation factor apportioned the underlying costs of the physical infrastructure used in direct support of the instructional activities of the campus. In other words, the allocation factor was intended to capture the capital costs and maintenance of the physical infrastructure used to support instructional activities, while recognizing that not all campus space is used for such activities.

It must also be recognized that each campus in the study was offering some fully online courses at the time of the study. Each of the institutions supported

development and delivery of these courses in their own unique way – some campuses had more centralization while others had less. However, for the purposes of this study, the number of semester credit hours generated by each campus via online instruction was determined by data reported to the Texas Higher Education Coordinating Board and excluded from the base SCH calculation, i.e. excluded from the denominator in the formula detailed above.

### *Reporting Period*

All data was collected from the various reports issued for the fiscal year 2007. This period covered the fall 2006, spring 2007 and summer 2007 semesters.

### *Online Delivery Costs*

Given that the level of centralization, or institutionalization, has been identified as a significant factor in the sustainability and success of online organizations, (Pina, 2008), there are fundamental cost differences between a centralized, enterprise-level, support organization and decentralized support at the college or departmental level. The level of student services provided by an institution has a direct impact on costs as well, (Meyer, 2006; Rumble, 2004). Not all institutions or systems operate their online learning functions in the same fashion. In fact, there are far more differences than similarities between organizations. Therefore, it is difficult to create a direct comparison between the delivery costs of traditional course delivery and online course delivery. In order to provide a reference against which the institutional cost data could be compared, this study



examined cost data for one of the several centralized online support organizations in Texas. Those data were as closely aligned as possible to the cost data derived for the seven subject universities by using cost categories analogous to those from the annual financial reports.

The student and faculty services offered by online support units are meant to supplant campus-based services for those students who may never set foot on a physical campus. Specialized faculty training is frequently required when instructors are presented with new pedagogical methods beyond a lecture, PowerPoint slides, and a chalkboard. The costs associated with these services may or may not have a direct analog in the cost structures relating to the campus-based face-to-face course delivery.

It should be noted that the online support unit used in this study did not directly hire faculty, admit students, or award credit. Therefore there was overlap and duplication of some costs in a direct comparison between institutions and this support unit. In order to alleviate this, the cost category of *Instruction* was excluded from the institutional cost analysis, as noted in the formula described above. The *Instruction* category consists primarily of the salary, wages, and fringe benefits of those individuals directly engaged in the delivery of instruction; assistant, associate, full professors; instructors; teaching assistants; graduate assistants. In this model, the instructional cost is borne by the campus. Therefore, the category of *Instruction* can be considered equal for both delivery modalities, and inclusion of this category of expenditures would skew the results when compared to the cost-per-SCH calculated for the online support unit. This study did not examine the amount of time or effort

required to teach in each of the delivery modes as both are subjective, but instead focused only on the costs of course delivery.

In order to represent the cost-per-SCH of the centralized online support unit, the derivation of the figure was simple:

$$\frac{(\text{Total annual budget}) - (\text{course development funding})}{\text{Total SCH supported by unit}}$$

Where the annual budget was the operating budget and course development funding was that portion of the budget made available to the campuses to offset course development costs when creating new online courses or programs.

An organizational budget is a fundamentally different document than an institutional financial report. One is a measure of allocated funds, and the other contains actual expenditures. The institutions included in the study were all at least ten times as large as the online support unit in terms of staffing, funding, and expenditures. However, this did not negate the utility of the comparison of delivery costs.

### *Institutional Identity*

The institutions used in this study will be referred to by pseudonym in the results described in the next chapter in order to not disclose specific institutional identity. In addition, while the characteristics of the institutional mission were an important feature of this study, only Carnegie classification and enrollment ranges were used so as to further mask individual institutional identity. A list of former U.S. presidents was randomly generated by one of the researcher's daughters, and those names were used in place of the specific institutional names. The following

table indicates these presidential pseudonyms, their Carnegie classification, and general enrollment range.

*Table 7: Characteristics of Studied Institutions*

<i>Institution Name</i>	<i>Basic Carnegie Classification</i>	<i>Enrollment Range</i>
Adams University	Master's University (Larger Programs)	10,000 < > 20,000
Buchanan University	Research University (High Research Activity)	>20,000
Coolidge University	Master's University (Larger Programs)	<10,000
Garfield University	Research University (High Research Activity)	10,000 < > 20,000
McKinley University	Research University (High Research Activity)	>20,000
Taft University	Master's University (Medium Programs)	<10,000
Wilson University	Master's University (Medium Programs)	>20,000

### *Analysis*

The algorithm described above produced a single cost-per-unit for classroom delivery of courses for each of the seven institutions. A similar number was produced by analyzing the budget of the online support unit. These numbers were reviewed using simple descriptive methods. A chart detailing the unit costs for all eight organizations, sorted several different ways, will be presented in the next chapter. To better analyze these results, the derived data points were summarized as to central tendency and variability. Each point is also be assigned a Z-score in order to better judge the inter-relationships between the cost figures. As a secondary analysis, the institutions were grouped according to Carnegie classification, and both

within-group and between-group descriptive statistics were reviewed. Any notable correlation between Carnegie classification and/or enrollment size with the cost-per-SCH was highlighted.

### *Qualitative Study*

The qualitative section of this mixed methods study consisted of a dozen interviews with specific campus officials. The individuals were either senior academic officers (Vice President for Academic Affairs, Provosts or Senior Associate Provosts) or senior business officers (Chief Business Officer). The 12 individuals were each associated with one of the institutions studied in the quantitative analysis. The original plan was to have two individuals from each of the seven studied universities – one each from the academic and business sides of the campus. Only 12 ultimately agreed to sit for the interviews, however, the group consisted of six academic and six business officers.

The interviews were held both face-to-face and over the telephone. Face-to-face locations were either the researcher's office or the interviewee's office on his or her campus. All were held during the business day.

The interview format used what Rubin and Rubin, (1995) call a guided discussion format, or what Morse and Richards term a semi-structured interview, (2002). In this interview method, questions are prepared in advance along with some general anticipated follow-up questions or probes. This method is appropriate when the interviewer "knows enough about the phenomenon or the domain of inquiry to develop questions about the topic in advance of interviewing but not enough to be able to anticipate the answers," (Morse & Richards, 2002, p. 94). The list of

interview questions is attached as Appendix A. All interviews were conducted between October 2008 and January 2009.

The interviews were digitally recorded and then transcribed. Ten of the twelve interviews were transcribed by a relative of the researcher. The remaining two were transcribed by the researcher.

### *Privacy and Security*

The identity of each interviewee was kept confidential. Given the small number of individuals interviewed and the level of detail revealed in these conversations, care was taken to excise any particular information which might lead the reader to a conclusion regarding the identity of the interviewee. All transcripts were reviewed for identifying comments, and those found were made generic where possible. The actual names of the institutions have been replaced with the pseudonyms noted above.

The textual narrative was excerpted for emphasis where needed to illustrate themes, rather than including the complete interview text. Even with generic substitutions, the complete context of an interview in some cases allowed for easy identification of the interviewee based on institutional characteristics, for example frequent references to “rural” or “isolated” and so where such phrases have been included for illustrative purposes, no attribution has been made to the interviewee’s role or to his/her pseudonymous institution.

### *Analysis*

The written transcriptions provide the data source for the theme-based approach to this study. The coding of the themes was done manually via an immersive reading of the written transcripts followed by the use of color-coded tags, 5" X 7" cards and cutting and pasting of pertinent passages of the text. The basic approach to this type of coding is well defined, (Creswell, 2003; Lincoln & Guba, 1985; Miles & Huberman, 1984; Rubin & Rubin, 1995; Teddlie & Tashakkori, 2009).

As the themes emerged from the texts, they were grouped and sub-grouped in what Teddlie and Tashakkori termed a "categorical strategy." "The categorizing process involves bringing together into provisional categories those units of information that relate to the same content, devising rules that describe category properties, and rendering each category set internally consistent and the entire set mutually exclusive," (Teddlie & Tashakkori, 2009, p. 255). Initial themes investigated were those closely aligned with the research questions, while ample room was left for new, emergent themes to appear.

### *Conclusion*

A mixed methods approach was particularly well suited to the research questions presented here. There was both a quantitative and qualitative aspect to this study. Using what Creswell call an "explanatory approach," the quantitative study involving financial information from seven institutions and one centralized online organization was performed first and the results of that analysis became a critical

piece of the qualitative investigation, (2003). A dozen individuals were interviewed based on their specific titles and roles in their institutions. These interviews became the basis of a textual coding and theme-based investigation which produced results that are discussed in the next chapter.

## Chapter Four

### *Discussion and Analysis*

Chapter Four presents the results of the mixed-method study outlined in Chapter Three. The explanatory design of this study was structured to place the quantitative analysis first, followed by the qualitative analysis. These two sections are presented below followed by an analysis which synthesizes the results from each.

#### *Quantitative Analysis*

A quick review of the algorithm used to derive the cost per semester credit hour (SCH) is in order. The basic configuration is:

$$\frac{A + B(F)}{S}$$

Where

A = expenditures per annual financial report of items Academic Support, Student Services, Institutional Support;

B = expenditures per annual financial report of Operation and Maintenance of Plant, Major Repair and Rehabilitation of Plant, Depreciation and Amortization;

F = allocation factor derived from institutional space inventory in the form of

$$\frac{\text{Square footage dedicated to instructional purposes}}{\text{Total institutional square footage}}$$

and

S = total annual Semester Credit Hour production.



Using the 2007 Annual Financial Reports and the 2007 Space Inventory data, and enrollment data from the Texas Higher Education Coordinating Board produced the following table of factors:

*Table 8: Reported Values per Institution*

<i>Institution</i>	<i>A: Total Direct</i>	<i>B: Total Indirect</i>	<i>F: %Instr.</i>	<i>S: Total SCH</i>
Adams	\$44,881,339	\$29,510,484	33.48%	447,723
Buchanan	\$74,712,786	\$51,595,109	32.21%	542,605
Coolidge	\$19,585,963	\$12,321,164	36.49%	130,158
Garfield	\$51,707,968	\$37,579,864	41.40%	329,347
McKinley	\$48,285,486	\$35,908,686	31.12%	440,165
Taft	\$10,187,960	\$ 7,044,162	29.20%	62,681
Wilson	\$80,468,283	\$55,321,742	38.00%	652,697

Where “Total Direct” is the sum of the reported costs in the categories of Academic Support, Student Services and Institutional Support; “Total Indirect” is the sum of the reported costs in the categories of Operation and Maintenance of Plant, and Depreciation and Amortization; “%Instr.” is the calculated percentage of campus space classified as instructional, and “Total SCH” is the total campus production of semester credit hours for the period fall 2006, spring 2007, summer 2007. It must be noted that the “Total SCH” figures excludes SCH production which was reported to the Coordinating Board as being conducted off-campus. Off-campus instruction, by Coordinating Board definition, includes courses delivered online as well as remote classroom instruction, and instructional television. Semester credit hours delivered off-campus were subtracted from the

campus total so that the derived cost/SCH represents truly on-campus, classroom based instruction.

Those data were then run through the algorithm, producing the following results.

*Table 9: Cost Per SCH - Campuses*

<i>Institution</i>	<i>Cost/SCH</i>
Adams	\$ 122.31
Buchanan	\$ 168.32
Coolidge	\$ 185.02
Garfield	\$ 204.25
McKinley	\$ 135.08
Taft	\$ 195.35
Wilson	\$ 155.49

This set produced a mean cost/SCH of \$166.55 and a standard deviation of 30.7245.

To derive the comparable cost/SCH for the online support unit, the following algorithm was used, as previously discussed:

$$\frac{(\text{Total annual budget}) - (\text{course development funding})}{\text{Total SCH supported by unit}}$$

The appropriate data from fiscal year 2007 for the online support unit were: Total annual budget of \$2,893,884, course development funding of \$200,000 and an SCH production of 35,109. This produced a cost per SCH of \$76.73, which is clearly well below the mean for the on-campus cost/SCH at the institutions.

A secondary analysis was performed on the institutional dataset, focusing on two specific characteristics of the institutions – Carnegie classification and

enrollment size. In order to facilitate analysis and to maintain the confidentiality of the institutions, they were assigned nominal codes for each criterion. For Carnegie classification, the institutions were assigned a 1 if the classification was as a Master's University (Medium programs); a 2 if classified as Master's University (Large programs); and a 3 if classified as a Research University (High Research Activity). All of the subject institutions were categorized under the Carnegie basic classification category as either Master's University, (which generally includes institutions that award at least 50 master's degrees and fewer than 20 doctoral degrees per year) or Doctoral-granting Universities, (which includes institutions that award at least 20 doctoral degrees per year), ("The Carnegie Classification of Institutions of Higher Education," 2005). The two institutions classified as Master's University (Medium Programs) were Wilson University and Taft University. The Medium Program designation indicates that these institutions award between 100 and 199 master's degree per year. The Master's University (Larger programs) indicates the institutions award over 200 master's degrees per year, and in this study Adams and Coolidge received this classification. The doctoral granting institutions were further broken down by level of research activity. Three of the institutions included in this study, McKinley, Buchanan, Garfield, were all classified as having high research activity.

The enrollment of the selected institutions varied greatly. For annual FTE enrollment of less than 10,000 the institution was assigned a 1; institutions with an enrollment range between 10,000 and 20,000 FTE students received a 2; and institutions that had greater than 20,000 annual FTE enrollments were assigned a 3.

These characteristics allowed for an assessment of whether institutional mission, as broadly represented by enrollment size and Carnegie classification, was related to cost/SCH. Because the sample size in this analysis was quite small, and the selection of institutions was non-parametric, the use of inferential statistical tests was inappropriate. However, the use of descriptive statistics did allow some conclusions to be made.

Z-scores were calculated for each institution's cost/SCH as a way of indicating the distance from the group mean, in units of standard deviation. This provides a method by which the variability within each sub-group can be judged. The Z-score is defined as

...specifying the precise location of each X value within a distribution. The sign of the Z-score (+ or -) signifies whether the score is above the mean (positive) or below the mean (negative). The numerical value of the Z-score specifies the distance from the mean by counting the number of standard deviations between X and [the mean] (Gravetter & Wallnau, 2007, p. 140)

Table X shows the cost/SCH for each institution along with its Z-score and its Carnegie Classification and Enrollment Range codes.

Table 10: Campus Data including Carnegie Classification, Enrollment Range, and Z-score

<i>Institution</i>	<i>Cost/SCH</i>	<i>Carnegie Classification</i>	<i>Enrollment Range</i>	<i>Z-Score</i>
Adams	\$ 122.31	2	2	-1.43966
Buchanan	\$ 168.32	3	3	0.05767
Coolidge	\$ 185.02	2	1	0.60122
Garfield	\$ 204.25	3	2	1.22702
McKinley	\$ 135.08	3	3	-1.02402
Taft	\$ 195.35	1	1	0.93753
Wilson	\$ 155.49	1	3	-0.35976

The following two charts display the cost/SCH as grouped by Carnegie classification and by enrollment range.

Figure 5: Campus Cost/SCH – Enrollment Grouping

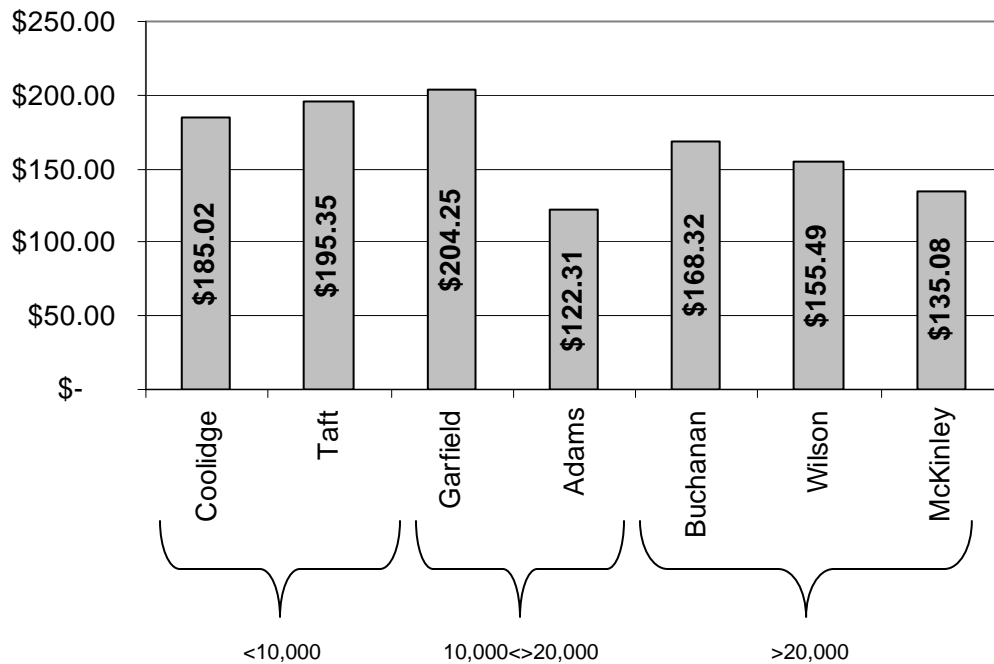
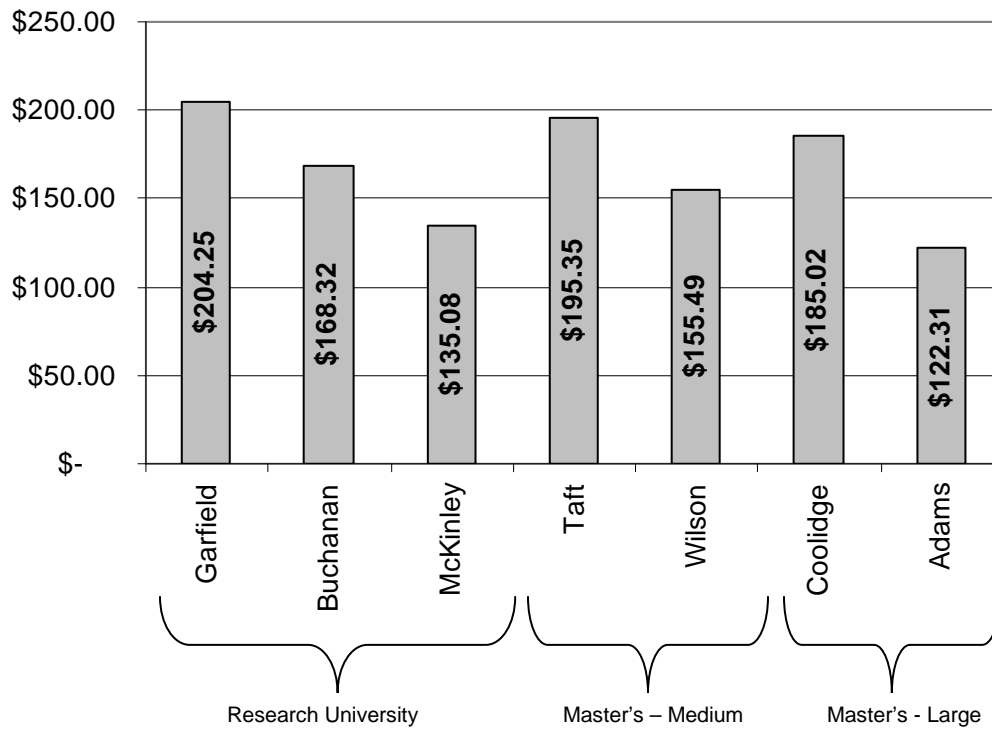


Figure 6: Campus Cost/SCH – Carnegie Classification Grouping



The range between the highest and lowest Z-score was calculated for each sub-group analyzed. When grouped by enrollment, the >20,000 group had a Z-score range of .968; the 10,000 – 20,000 group had a range of 3.039; and the <10,000 group had a range of .583. The sub-groups of the largest and the smallest institutions, therefore, can be said to have had fairly similar cost/SCH, while the middle sized institutions had a much wider variance in cost/SCH.

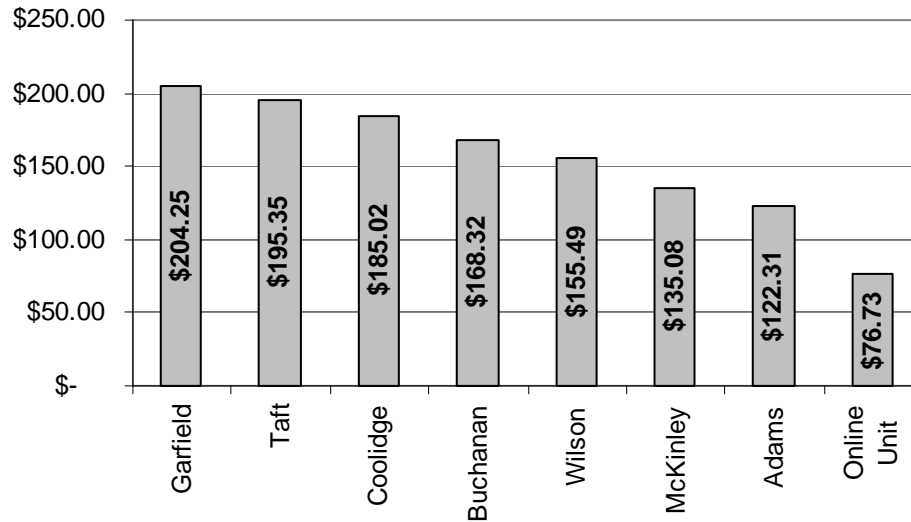
When grouped by Carnegie classification, the Research University group had a Z-score range of 2.690; the Master's –Medium group had a range of .179; and the Master's – Large had a range of 1.893. When grouped this way, then, only the Master's – Medium institutions could be said to have had similar cost/SCH.

The ranges of Z-scores were simply a way to analyze whether the sub-groups, either by Carnegie classification or enrollment range, were in any way predictive of cost/SCH. Very little connection between institutional mission and cost/SCH was found.

It must be noted that there are some key differences in the derivation of cost for classroom instruction at the campuses and the similar derivation of cost for the online unit. As pointed out earlier, the annual financial reports and budgets are used for different purposes and therefore are not truly analogous as data sources. The differences between the algorithms are not sufficient to invalidate this study, however.

Figure 7 shows the figures for the institutions and the online unit arranged by cost/SCH. As indicated previously, the cost/SCH for the online unit was substantially lower than the values for any of the institutions. In fact, it was less than half of the value of the institutional group mean of \$166.55. To the extent that the analyses captured analogous costs, then, the centralized online unit had a substantially lower cost per unit delivered than any of the individual institutions in the study.

Figure 7: Cost per SCH, Online Support Unit Included



### Qualitative Analysis

Twelve interviews were conducted in a two-month timeframe, six each with the chief business officer (CBO) and/or the chief academic officer (CAO) from the institutions included in the quantitative study. An overview of the results of the quantitative study was presented to the interviewees during the course of the interview. The interview format used a common set of questions, which are included as Appendix A, but the conversation was allowed to build in a natural progression and some deviations were pursued via follow-up questions.

The interviews were then transcribed and the written text was analyzed for specific key themes. The emergent themes, based on the interview questions, were a) reasons behind offering online courses, b) perceptions of the quality of online courses, c) perceptions of the cost of online courses, d) adequacy of the data sources for cost and space information, and e) role of cost information in decision making.



### *Reasons Behind Offering Online Courses*

The reasons stated for offering online courses and programs can be generally put into the distinct categories of access, growth, and campus space constraints. The size and Carnegie classification of the institution was related to these responses, with representatives from the smaller institutions citing the need to increase enrollment while those from the larger institutions cited space concerns as driving them to offer more online courses.

The CAO of Wilson University, (FTE enrollment >20,000) stated, One of our biggest challenges on this campus is lack of space and it has its impact in the fact that we have to cancel classes every year not because we don't have a teacher or students to take the class but because we don't have a place to hold the class. I believe that distance education and online delivery is going to be the method that we use to address that.

While the CAO of Garfield University (10,000 – 20,000 FTE enrollment) stated flatly, “We’re out of space and that’s a huge driver to do more distance education, forget about cost.” This same CAO also discussed how local commuting drive times and parking congestion were a factor in his move toward online delivery.

The Chief Business Officer at a relatively rural campus discussed the need to grow enrollments, “[A large portion] of our student credit hours are from online courses and that’s certainly an area that we can’t ignore as we continue to grow the institution.” The CAO of the same institution echoed this, saying, “... We need to grow. There are only so many [students] we’re going to get from our local area.”

Expanding access was related closely to growth and was a recurring theme when discussing why institutions are moving courses online. One CAO stated, “...Ideally distance education should provide an opportunity for the university to reach populations of students who are for a variety of reason unable to come to the campus in order to complete their degree.” The CBO from the same institution stated, “...There’s been a lot of criticism about our flat enrollment. And this is a way you can bump it quickly by going to online courses.” The CBO at a different institution states, “I think we jump in [to offering online courses] because we think we can meet a need.”

Some of the other factors mentioned when discussing these motivators toward online offerings included opportunity or competition factors, which might be loosely translated as “keeping up with the Joneses.” There seemed to be some pressure to offer online courses because of a perception that it was somehow expected of the institution or because peer institutions were offering online courses. Related to this rationale was the idea that today’s college-aged students have an expectation of being involved in technologically enriched courses, and that they are quite adept at learning in an online environment. Whether or not this assumption is based in fact, it is clearly present among policy makers. Several times the technological savvy of incoming students was mentioned as a motivator. The ability to aggregate demand for low enrollment programs was mentioned by one CAO, where by moving a course online he believed he could draw enrollments in from a larger pool of qualified students than represented on his campus.

### *Perceptions of the Quality of Online Courses*

There are two clear sets of perceptions regarding online courses, both positive and negative. The positive group might be termed as coming from “true believers” regarding online instruction – those that have some enthusiasm for it, while the negative group couch their arguments a little more quietly and might be seen as somewhat defensive. This defensive language might be attributed to the known employment of the interviewer in the field of online distance education, though significant efforts were made to establish clear distinctions between this research and that position. Frankly, these respondents might have used more aggressive negative language had the interview been conducted by a different researcher.

From the positive side, comments ranged from, “...people are comfortable with it, younger kids that are more technologically savvy and that are more comfortable learning that way,” to, “...there’s much to be gained from it,” to having the opportunity to, “...deliver [a] well thought-out new kind of course.” Several of the interviewees seemed to take as a given the quality of online instruction, since that notion was not specifically brought up in any of the interviews.

Some of the interviewees, however, were not particularly enamored of online courses. It is worth noting that they represented campuses that did not have large numbers of online courses. While not overtly hostile to online delivery, their word choice and attitude left little doubt that they felt online delivery was not as good as classroom delivery. One CAO stated, “...there is some intrinsic value to meeting instructors and classmates in real space-time.” This same CAO stated that while,

“we’ve been refining conventional lecture modality since Plato,” he believes that in terms of online delivery, “...we are still at best only halfway up the learning curve, if that.” The CBO of a different campus stated that, “I’m one of those traditional [chief financial officers] that believes that there is a very limited amount of [online instruction] that should be put toward a degree requirement...” The CAO of a large campus expressed a common sentiment among long time faculty,

I think the richest educational environment is when you have a class of 20 and they’re having a good discussion and students are reacting to each other’s views as well as to the teacher’s views. That’s when the best critical thinking happens.

He finished by admitting, “I hold on to my Luddite views when it comes to those things.”

The degree to which these attitudes affect how aggressively an institution pursues online course deployment was not the subject of the study. But of the seven studied institutions, the officers expressing the most negative views represented the campuses with the fewest online course offerings. Whether their attitude was a result of lack of exposure to online courses, or whether the paucity of online courses at their institution was a result of their attitude is unknown.

#### *Perceptions of the Cost of Online Courses*

There is a clear dichotomy of opinion regarding whether or not online courses are more or less expensive to offer than classroom courses. While none of the interviewees had deeply investigated the issue or could cite specific data, there was a rational thought pattern behind each of these points of view. For those who

stated a belief that online courses were more expensive, the rationale was primarily that online courses require a larger team to produce and deliver than classroom courses, and those extra salaries add direct costs. For example, the CAO of Buchanan University stated, “I think ultimately [the cost is] greater because of the back office stuff... You’ve got instructional designers, the technology, the servers, sending them to training... There is more cost involved.” Similarly, the Taft University CAO stated, “The one area that is probably higher in cost is the staff support for the preparation of the materials... the need for staff support.” The Wilson University CAO said, “I think it ends up being more expensive mostly due to the time and energy it takes to prepare the course and deliver it.” He further noted that, “...the mythology, if there is one among chief academic officers, is that it’s always going to cost more to offer something online...”

For those who believed online courses are less expensive, their line of reasoning related to which costs are captured in the analysis. Having a deep understanding of the building and infrastructure costs, the CBOs tended to believe that when those costs are included in the calculation, then the classroom delivered course will have greater costs. As one CBO said,

Yeah, that’s one of those question that it depends on what you consider in terms of cost. I mean if you roll in the cost of the infrastructure – the building, the heat, the light – both the capital and operating expenses of the facility, I imagine online is significantly cheaper.

Another CBO echoed this by saying,

I think if people take the total cost of classroom instruction into account which includes the land, the facility itself as well as in-the-classroom instruction and technology within that classroom just to service those people in that classroom, I think it's more expensive to have [classroom instruction].

A different line of reasoning was expressed by some regarding the potential for class scaling and re-use of content inherent in online delivery. The Buchanan University CBO stated, "My sense is that if you were to develop a course [with] material that you could use over and over again... it would probably be cheaper, just on the basis of you getting more output per dollar of input." The CAO of the same institution commented,

In theory if you could find the right model, your [online delivery] has a greater chance of recouping costs than does the face-to-face because face-to-face is constrained by the physical limits of the room. In theory you should be able to scale it quicker at lower costs than you could the same face-to-face campus course.

An interesting alignment of interviewee roles and their opinions regarding costs of online instruction became evident during the analysis. The chief academic officers all expressed the opinion that online delivery was more expensive than classroom delivery, while the chief business officers all felt that online instruction was less expensive than classroom instruction. This alignment is most likely caused by what the different roles are exposed to in terms of costs. Business officers are

acutely aware of infrastructure costs, and therefore judge that online courses are less expensive. Academic officers are much more familiar with instructional support costs, and online courses tend to require more of those resources than does traditional delivery; therefore online courses are judged to be more expensive than classroom.

*Adequacy of Data Sources for Cost Information*

Based on several of the interview questions, a theme emerged from the interviewees relating to the adequacy of the data sources used in the quantitative study as well as a broader discussion of how cost information is gathered and used on the campuses. Each interview included a short oral presentation of the methodology and results of the quantitative study. This was followed by a question regarding how each interviewee would assess the usefulness of this kind of information and whether the sources of data, (annual financial reports and Texas Higher Education Coordinating Board reports) provided a sufficient and accurate basis on which to perform such a study.

When asked about the usefulness of the quantitative study relative to their roles as either chief academic officer or chief business officer, several of the responses focused on the inter-institutional nature of the study, which was viewed as both a positive and a negative. One CAO stated, "...What's hanging me up is you're talking about inter-institutional [comparisons] and the institutions are not funded the same. So your costs are tied heavily to preexisting revenue streams which then [are] tied to the depth and breadth of any service you provide..." Yet a CBO stated,

“...most numbers in higher education no matter what those are, are only meaningful when you compare yourself to your peers.”

As far as whether the quantitative study produced useful results, several of the respondents would have been interested in a more detailed analysis. They made statements such as, “...it would be more beneficial somehow to go a little deeper,” or “to be honest with you I don’t think it would help me...” and “...my first gut instinct says it’s very generic.” Several of the responses, however, acknowledged the usefulness of a study such as the one presented to them. The McKinley University CAO commented that, “...you can’t get perfect data, so you want to put your conceptual framework out there and help move the process along...I think it’s a good idea to have some analysis of this sort [using] public data.” The Buchanan University CBO indicated that,

This is a rational way of looking it. This is as good as any because you’re approaching this in a logical, rational way, and you’ve got to somehow do what you did; you’ve got to try to capture all those costs that are not direct costs and then allocate them over some activity base.

Wilson University’s CBO added, “I recognize the fact that comparing from institution to institution is what we do. It’s really the only source we have...”

There was some discussion regarding the accuracy and appropriateness of the public data sources in a study such as this one. The chief business officers clearly knew far more about the specifics of how financial reports were generated from each campus, while the chief academic officers had perhaps a broader point of view.

Several respondents commented that the annual financial report (AFR) provides a



standardized method for comparing costs with statements such as, “I think the annual financial report has the benefit, assuming you are within the same state... They’re basically prepared on the same basis, in the same manner.” One CAO noted that, “You want sources of data that are essentially public pieces of information, so in that sense [your data sources] are as good as any.” The Wilson University CBO remarked that the AFR, “...is our main source of financial data and we do have some good foundational material about how to classify things but it really gets back to how each institution can accurately account for some of the costs.” The McKinley University CBO opined, “I think what the annual financial report will get you is some comparability of the data, assurance that it is comparable data, because we are all required to report in a similar fashion.”

The issue of how items were classified and then reported in the AFR came up in several interviews. The Buchanan University CBO spoke at some length about potential differences in cost categorization. He said,

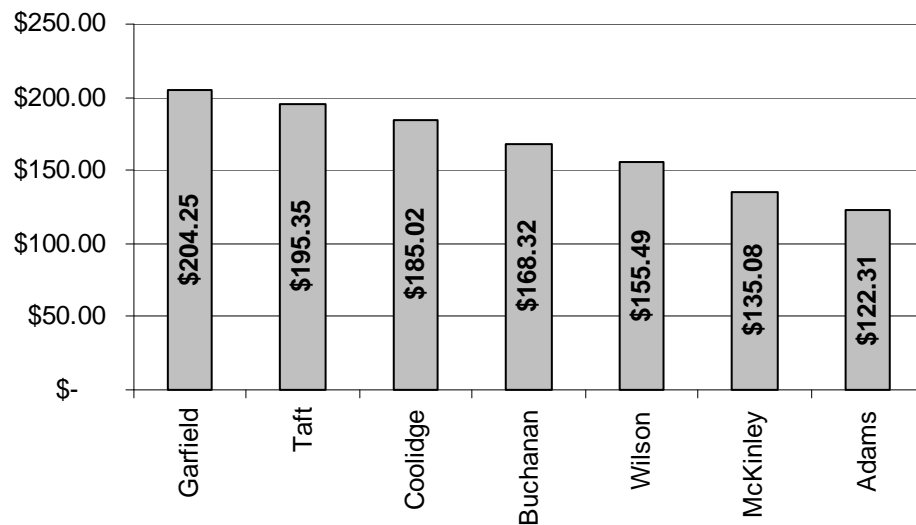
...there’s difference among every school on how these things are categorized. Certainly about how some of the expenses in the AFR are coded but it’s pretty close. You’re going to have some differences and guys in my position especially, when the data doesn’t make them look good they’re going to argue that it’s not real...I think it’s the structure we have to work with right now otherwise you have to come up with another one which will be even less meaningful because no one will know what the definitions are.

The Taft University CBO remarked about the THECB reports,

Well, we try very hard to get our Coordinating Board numbers right, because they eventually filter back into the [statewide funding] formula, number 1. Number 2, they do reports on lab and classroom utilization so you don't want to overstate your classroom space, your E&G space, because you get killed on where you rank on classroom utilization.

In the course of the interviews, a chart similar to the one below was shown to the interviewees and the identity of only their institution was disclosed to them. Several of the interviewees, having read the briefing and discussed the methodology with the researcher, had perhaps intuited where their institution might fall in such a distribution. There were no expressions of surprise upon seeing this chart.

*Figure 8: Cost per SCH, Campus Cost/SCH*



Several of the interviewees, upon seeing the placement of their institution on this chart, quickly began forming rationales as to why they placed where they did, or they asked about specific parts of the methodology. Once the chart was presented, some of the less engaged interviewees became more engaged in the conversation. Comments ranged from, “does this include [a particular type of] funding?” to “I’m not surprised that we come toward the bottom.” One CAO stated, “The real driver [is that] our funding is high, therefore our cost per credit hour should be high... and it looks high.” The cost/SCH for the online support unit was not included in the discussion or on the chart shown to the interviewees, as it was felt this would have caused the discussed to focus on the online unit rather than the inter-institutional differences.

#### *Role of Cost Information in Campus Decision Making*

A significant part of the discussion was geared toward illuminating how the administrators collect and use cost data in academic decision making on the various campuses. The specific focus of the questioning was aimed at how cost information is integrated into decisions regarding offering courses online or face-to-face. However, what emerged was a series of themes regarding the adequacy and utility of information provided to the CAO from the Business office, and the variety of decision factors that underlie the delivery decision.

Most interviewees, both from the business and academic sides of the institution, indicate that cost is but one of a wide range of decision factors relating to offering online courses. While both business officers and academic officers collected and used some form of cost data, it was the CAO who ultimately had the

authority and responsibility regarding course offerings. As one CBO said, “...Ultimately if the Provost and executive staff believe it’s important for various reasons we would probably offer [an online course] even if it were a loss leader.” A number of issues were mentioned as factors which play into the decisions to offer a particular course or program. Most responses indicate that, in fact, cost is one of the least important decision factors.

The Taft University CAO characterized the issue as follows, “Costs are important, [but] you’ve got to look at your strategic issues and the costs will come in.” Others were specific in mentioning increasing enrollments and providing access and outreach as factors which were more important than costs *per se*. The Wilson University CAO said, “I guess we tend not to talk so much in dollar terms as we talk in student credit hour production...” While the CBO from Taft University stated succinctly, “Cost doesn’t capture all of the decision making issues.” He continued by saying,

I don’t think we look at costs; what we look at is [is] the course going to meet the enrollment guidelines? Obviously the enrollment and the revenue are related...[but] whether the course is likely to fill and achieve a reasonable enrollment is more important than a dollar cost.

The CAO at Garfield University commented on the host of issues surrounding online delivery and cost this way.

In the real situation there are many other factors that tend to dominate such as availability of personnel, the interest of the faculty, the difficulty of motivating faculty who are not so inclined, competence, then the cost

of the specific infrastructure, the capability of what's on the market; so, those are a variety of issues. But oftentimes the explicit cost is not the most evident issue.

The Buchanan University CAO made a similar comment,

If you're trying to determine in the study whether cost is the decision factor about whether or not we're going to offer something online, that is very low on our priority list. It's there, but to me it's more about is there a market for the online students, can we find faculty members who are interested in developing the courses, can we deliver them in a quality way -- those kind of things. The cost of the delivery is at the very bottom of that list.

For those interviewees who spoke about campus space constraints as a driver toward putting courses online, the cost of delivering online courses was even less of a decision factor. The Garfield University CAO spoke at length about this,

It's a political issue and the real driver is availability of space or ...[un]availability of space and that overwhelms cost factors because once you have the space, the cost of heating is hardly more than mothballing it. And if you don't have it you can't get it. To stay in business, you're desperate to find a way to keep enrolling students. So again, in the real world it's not that cost is unimportant but it comes in so many complex ways and there are costs that are within the ordinary uncertainty level. You know, real life, you can't figure it out so you just forget about it.

The Wilson University CAO spoke a little more succinctly in the same vein, “So what I want to look at is the lost income from the class I couldn’t offer versus being able to offer the class in a format that students could do with the limitations we have on physical space.”

This idea of opportunity costs which were brought up by the Wilson CAO emerged several times during the interviews. The Adams University CBO was explicit about them:

I think one of the things you need to bring up is not just the costs, but the opportunity cost of lost degree completions with your institution. You know what I mean? If you don’t offer [a particular course] and they go someplace else are they going someplace else for the rest of their program? So I think there are opportunity costs that you may want to somehow get your arms around.

The McKinley University CAO had a similar comment,

...at the moment I tend to be looking at it more in terms of [what are] the opportunity costs of my other uses for this resource. The notion of an opportunity cost for faculty time is again one that I don’t think we get our heads around very well.

One other clear theme among the interviewees was the idea of return on investment, where any cost calculation needed to be paired with a revenue estimate to ensure that the courses or programs were generating support. Both the business and academic officers recognize this need to balance cost with revenue. One of the

questions asked in the interview was, essentially: How much of a cost differential between online and face-to-face delivery is acceptable? One CBO stated in response, “I would think it would be the cost and revenue calculation. I mean, if it costs significantly more, then we would need to be able to generate more revenue... You know, if it costs more eventually it’s got to produce more in terms of revenue.” The McKinley University CAO said, “I’m looking at it as are you cost efficient with regard to your other options?”

The Buchanan University CAO spoke about this idea of return on investment in the following terms,

I don’t think we work on that fine a margin. I think we are going after things where the market is so big that we know that there will be return on investment...things where you just know there’s a lot of unmet demand out there in the marketplace that without putting pen to paper you know that you’re going to get return on investment.

The concept of cost efficiency and return on investment emerged also in discussions about what the respondents termed as “sunk costs.” That is, they recognized that significant investments had been made in infrastructure and technology on which the online courses relied, and therefore there was a desire to make maximum use of those resources. This line of reasoning was most often associated with the campus acquisition of a course management system, or CMS. This is a class of software used to provide online support for classes. It is used both to enable web-enhancement of classroom based courses (as an online resource repository, for example) to supporting all of the teaching and learning activities of

fully online courses. The Taft University CAO, in particular, was focused on this cost element. He stated,

...look at what I would call major fixed costs [such as the] learning management system. We look at the cost of what the system is, what we're getting for that, but once we've bought it, it's a fixed cost. You have to have a learning management system and once you get the license, you know, it's not per head or anything else, it's a fixed cost. Which of course then means that every time – every online credit, every enhanced course credit – any way we can use it, then use it.

The CAO of Buchanan University held a similar point of view,

I don't think the subsidy differential between an online and a face-to-face course is as great as it used to be...Because of all the demands on instructional technology, we've got significant capital investment in [classrooms] now. We've got projectors hanging in almost every classroom, you got computers, you've got DVD players, you've got faculty members who have more tools available to them. The [CMS] platform that we have on campus probably I'd say 80% or so [of] the classes that are on there are hybrids. The investment there is not really to support online. So I would argue that the gap [is declining]...and that may be another reason why you just don't cost it out as much because it increasingly just becomes the cost of doing business.



### *Conclusion*

This chapter presented the results of both the quantitative and qualitative analyses performed in the overall mixed method study. The study sought to explore the differences between the delivery costs of online courses and traditional classroom delivered courses. Further, the study investigated the role of costs and cost information in decisions regarding offering online courses. Inferences were drawn from both the quantitative and qualitative studies, and conclusions are presented in Chapter Five.

## Chapter Five

### *Conclusions and Suggestions for Further Research*

#### *Introduction*

This chapter will present an integration of the quantitative and qualitative portions of the mixed methods study and then present general and specific conclusions based on the results of this research. In addition, suggestions for further research are offered.

#### *Integration of Quantitative and Qualitative Strands*

The mixed method research process keys on the ability to derive inferences from each of the individual research strands, as well as from the integration of the two strands. In this study, the quantitative exploration attempted to provide a consistent measure which could be used to compare institutions in terms of their cost to deliver a single unit of education. That information was a derived dollar amount per semester credit hour of instructional production. The qualitative study explored the assumptions and opinions of campus decision-makers regarding the role of costs in academic decision-making as well as an exploration of how the online delivery modality fit into their campus' strategic vision.

#### *Inferences from Quantitative Study*

The quantitative approach used publicly available cost and activity data in an algorithm intended to derive a common cost factor for each of the institutions

included in this study. A similar algorithm was used to derive a cost factor for the centralized online unit. The basic results presented in Chapter 4 are repeated here.

*Table 11: Campus Cost per SCH*

<i>Institution</i>	<i>Cost/SCH</i>
Adams	\$ 122.31
Buchanan	\$ 168.32
Coolidge	\$ 185.02
Garfield	\$ 204.25
McKinley	\$ 135.08
Taft	\$ 195.35
Wilson	\$ 155.49

For comparison purposes, the online unit's derived cost/SCH was \$76.73.

A basic assumption in the study was that the methods used to derive the cost/SCH for classroom instruction at the institutions and the method used to derive cost/SCH for the online support unit were analogous. If so, then the online support unit is clearly capable of producing an SCH at a significantly lower average cost than any of the institutions. The campus algorithm was structured to capture the cost of the campus physical plant used in the instructional activity of an institution. That investment in infrastructure is large and as such can explain a significant portion of the difference between the cost/SCH of the campuses and the online support unit.

When parsed by institutional characteristics, it can be said that campus size, (as represented by enrollment), had little correlation to derived cost/SCH. The costs

for the largest enrollment campuses in this study were clustered around the mean cost/SCH, costs at the mid-size institutions had a large degree of variability, and those at the smallest campuses showed a moderate amount of variability.

When parsed by mission (as represented by Carnegie classification), the effect was different. The research campuses – which typically have larger enrollments -- exhibited a high degree of variability in their cost/SCH figures, while the figures for the masters (medium program) institutions clustered around the mean, and the figures for the master (larger programs) showed large variability.

The first inference from this analysis is certainly that neither size nor mission appears to explain differences in institutional cost/SCH. If these critical campus characteristics do not directly affect the cost/SCH, it should then be asked whether there are other inferences that can be drawn from the data. An argument can be made that this number represents a measure of campus cost efficiency. As Rumble defines it, “efficiency is the ratio of output to input. A system is cost efficient if, relative to another system, its outputs cost less per unit of input,” (Rumble, 2004, p. 120). If the premises and assumptions of the algorithm are accepted, then this cost figure provides an inter-institutional measure of the efficiency by which the campuses produce their true product – student instruction, here measured through SCH. By this token, then, it can also be argued that the centralized online support unit delivers very cost efficient student learning online as compared to the campuses studied.

However, it must be acknowledged that when comparing the cost elements between on-campus delivery and online delivery, it is not an “either/or” scenario.

Some of the costs captured in the campus study are necessary elements of course delivery in the centralized online unit as well. Most notable of these cost elements would be the campus office space associated with the instructional staff – faculty, teaching assistants, and instructional design staff. Additionally, online students will consume some small proportion of the costs associated with certain centrally funded campus offices like admissions, the registrar’s and financial aid offices.

The costs of the salaries of instructional staff were excluded from the algorithm. As noted before, this was because faculty teaching loads were assumed to be unaffected. That is, the costs would have been the same regardless of instructional delivery method (face-to-face or online). The cost algorithm is a method by which other required costs can be factored in and then allocated across the total campus production of semester credit hours. Some of the potential cost elements which may have skewed the calculation include the total amount of instructional support of an institution, the amount and cost of the student services provided and the total size of the physical plant. Of note is that the category, “academic support” included central academic administration which represented the staff of the dean’s office, and the category, “institutional support,” included most of the other executive-level positions and their respective staffs. The aggregate number and cost of these functions certainly could have had an effect on the cost/SCH as derived, and therefore on the cost efficiency of the institution.

The total physical size of a campus and the proportion of space designated as “instructional space” could have also impacted the algorithm. Those campuses which had large physical plants or used a high percentage of their physical plant for

instructional purposes wound up with a larger allocation of plant operations costs in the algorithm than did other campuses. Certainly the total SCH production of the campus, being the denominator in the algorithm, had a large effect on the outcome also.

To illustrate these factors, the campus with the highest cost/SCH was Garfield University. Garfield was a relatively selective and expensive institution. As compared with the other institutions, Garfield had the highest total direct costs (that is, academic support, student services and institutional support), the highest indirect costs (that is, maintenance and operation of plant and depreciation and amortization), the third highest gross square footage, and the third smallest production of semester credit hours. Each of these factors contributed to Garfield's high cost figure. Conversely, the campus with the lowest cost/SCH was Adams University, which had an average campus as measured by total square footage of physical plant, and comparatively average direct and indirect costs, and SCH production. So, while the relative size of the individual factors in the algorithm certainly contributed to the derived cost/SCH, none of them appeared to predict that cost, nor did any one of them consistently outweigh the others in determining the final cost/SCH.

#### *Inferences from the Qualitative Study*

Twelve interviews were conducted with chief academic and chief business officers. The interviews were designed to elicit assumptions, motivations, and opinions around two central themes: online delivery of courses and the role of cost in academic decision making. The quantitative study results were presented to the

interviewees in order to obtain their opinions concerning the basic algorithm used, the spread of derived cost/SCH figures, and the use of such information in their decision making.

Two of the interview questions were designed specifically to determine whether the results of the quantitative study were of benefit to the respondents, and second to discuss the merits of the sources of the data used in the study. Responses aligned fairly well, with most interviewees indicating that the study as presented was of only limited interest to them. The primary concern was that inter-institutional comparisons – while interesting – presented them with very little actionable information. In other words, the respondents felt that regardless of where their institution fell in terms of cost/SCH (either high, average, or low), there was very little they could do to effect changes to that ranking. This was echoed by both the business officers and the academic officers.

However, in terms of the validity of the data sources and its construction, the algorithm was generally favorably received. The algorithm was discussed with each interviewee, and in general, there was consensus as to the approach. Some respondents wished for more detail than the algorithm was designed to provide, but none of them felt it produced inaccurate results given the inputs. Comments tended to be made such as “the best available data” and “you have to go with what you can get.” The fact that the annual financial reports provided a consistent schema for reporting cost figures provided a fair degree of comfort, even if many understood there are subtle differences in the way costs are classified within AFRs across campuses. There was more comfort expressed in the use of Texas Higher Education

Coordinating Board data, due to a recent focus (up to and including on-site audits) on the campus space reports produced by the Coordinating Board.

When reviewed *in toto*, the interview responses provide solid footing from which the stated research questions can be addressed.

*RQ1: What role does cost play in the institutional decision to offer an online course in comparison with a face-to-face course?*

Responses from the participants indicated that cost is one of the least important decision factors in moving courses or programs online. They were clear that they thought cost was – or should be – an important consideration, but its importance was minor compared to other drivers toward online delivery such as increasing enrollments, increasing access, reaching niche markets, etc. The fact that the responsibility for these course delivery decisions lies squarely within the academic side of the institution (as opposed to the business side) suggests that cost factors may not rise to the same level of importance as the other decision factors.

Many of the respondents pointed to the link between the costs of offering online courses and the potential increased revenue those courses might generate. This line of reasoning, demonstrated by both the chief academic officers and the chief business officers, echoes the notion associated with supporting campus auxiliary enterprises in the sense that such activities are undertaken only if they will generate sufficient revenue to offset associated costs. This is, perhaps, evidence that online delivery was still considered by some to be “other,” or “niche,” or outside the main academic mission of the institution. In other words, the cost/benefit mode of thinking was seldom evident when discussing the traditional, core, classroom based



programs an institution offers which benefit from general institutional subsidy. It is clear that these interviewees, with but one or two exceptions, still viewed online delivery in a different way than classroom instruction.

When asked about costs associated with course delivery, the academic officers consistently indicated that they had very little useful or actionable data available to them regarding costs. The lack of such information was cited as a key reason that cost was not more important in their decision making.

*RQ2: What are the current best practices relating to cost determination for online course delivery?*

What the respondents indicated with a high degree of consistency was that there were no well defined practices regarding determining the costs of online courses. While some basic data on overall instructional costs were collected on the various campuses, they were primarily limited to faculty costs and enrollment trends. There did not appear to be any methods by which costs per course were calculated. While the various cost elements of such a method are certainly available and administrators could easily perform such calculations, the business officers indicated that they had little motivation to do so. They felt that such cost/course data, lacking a much richer context of information, did not affect decision-making in any significant way. Combined with a lack of immediate utility, two of the business officers indicated that, frankly, if such a report were produced and indicated problems, it could actually become a liability to the administration.

The business officers, as a group, believed they were collecting as much cost data as they could. They also believed that in general they were providing the

academic officers with sufficient cost data. In fact, several of the business officers indicated that the reports and data they provided to the academic officers were not thoroughly consumed or understood. Similarly, academic officers felt that the data they received was of little value to them in terms of assisting with decision making. The business officers felt that the academic officers did not use what they provided, while the academic officers felt that the business officers were not providing useful data to them.

This was evidence of a disconnect between the business and academic sides of the academic enterprise. This was apparent more clearly at some institutions than at others, and was evident in the choice of language of the two groups of interviewees. The business officers spoke using business terms focusing on revenues and expenditures, while the academic officers used language focused on mission and access. Several of the business officers commented on their non-participation in academic decision making; one stated he was “never at the table” during academic decision-making. It is clear they saw themselves as the providers of reports and information, but not the drivers of decision-making on their campuses.

Understandably, there was a lack of clarity on the part of several of the respondents regarding the costs associated with technology as it relates to the costs of online courses. In essence they believed that the fundamental cost difference between online and classroom instruction was due to the technology involved. In fact, one or two of the interviewees pointed out that, in the current environment, technology costs are present in a significant way in classroom delivery as well as in online delivery.

*RQ3: What are the perceptions of campus leaders regarding the delivery costs of online courses in comparison with face-to-face courses?*

As noted previously, some of the interviewees felt that online was more expensive to deliver than more traditional modes of instruction while others felt it cost less. There was a strong correlation between this cost perception and the respondent's job title. The business officers, aware more generally of the significant cost of physical infrastructure, felt that online instruction was less expensive because offering online courses did not consume physical resources in the same manner as classroom instruction. On the other hand the academic officers, while less attuned to the physical infrastructure costs, understood the costs associated with the need to provide assistance to faculty members to design and deliver online courses, and they felt online instruction was therefore more expensive than classroom course delivery.

The bi-modal distribution of these perceptions is itself interesting. Because the role of the interviewee appeared to have an impact on their assessment of online costs, one might infer that there exists little compelling research on this topic. In other words, in the absence of existing research, the business and academic officers are informed primarily by their personal experiences, logic, and perceptions rather than any external reference which might either bolster their individual points of view or dissuade them.

*RQ4: Does the role of cost information in decision-making differ based on the size and mission of the institution?*

The short answer is no. Note that it has already been established that cost data did not play a role, in any meaningful way, in campus decision making

regarding course delivery at the institutions in this study. Therefore, we would expect to see no difference regarding this role based on size or institutional mission.

However, it is clear that campus mission, as represented by size and Carnegie classification, had a significant impact on the role that online delivery played in the institutional strategic plans – at least in the study. Administrators from the smallest campuses represented in the study expressed the strongest desires to expand their online programs as a means of increasing enrollment – for which there would, clearly, be an immediate financial gain to the institution. Representatives from the larger campuses, who have a much stronger focus on growing their research enterprise, expressed less enthusiasm for a wholesale increase in their online offerings – although they looked favorably on online instruction as an approach to high-value, niche markets.

Essentially, administrators from the larger doctoral degree granting institutions in the study appear to view online instruction in the same vein as continuing education or executive programs in the sense that it is external to the core of the academic mission and the expectation was that it should generate revenue. This is contrasted with the view of representatives from the smaller campuses who saw online instruction much more as a way to expand their institution's core academic mission. Online delivery helps these smaller, typically rural, campuses to fill undersubscribed programs, and allows them to attract a wider variety of students than they could draw from their local populations. At these smaller institutions then, driven by necessity, online instruction is not viewed as “other” but as a seamless extension of their teaching and learning mission. At the larger institutions there was

far less need to increase enrollment, and the issue of access was approached much more frequently from a financial aid standpoint than from a time or geography standpoint. In other words, the primary way for these larger institutions to lower barriers to attendance was through price manipulation (that is, discounting tuition or providing financial aid) rather than offering more courses or through distance education.

### *Conclusions*

The broad question put forth here is whether online delivery of college courses is more or less expensive than traditional classroom delivery. There are many avenues that can be pursued in answering this question, and this study forms some groundwork for providing a consistent inter-institutional comparison of costs while investigating how campus administrators view costs relative to online instruction. There are several currents which have culminated in moving this question to prominence. A quick review of that background is in order.

Online delivery of courses is now decidedly common. Many of the earlier questions about quality have been answered in the affirmative. Because of these quality concerns however, online courses have undergone far more extensive scrutiny and review than comparable classroom courses, (Russell, 2001). With proper design, courses meet or exceed the quality of their traditional counterparts. If, then, the quality question has largely been addressed, the cost issue has now moved to the forefront. In the current environment, external demonstrations of cost-efficiencies and cost accountability are increasingly required. Understanding

campus cost structures and comparative measures of costs relative to instructional delivery methods is now of vital importance.

The impressive growth of online course delivery by campuses across the nation shows no sign of slowing down (Allen & Seaman, 2008). Institutions have approached online instruction from a broad range of motivations, but virtually all institutions now offer some form of online courses. As was made clear by the study participants, this growth serves a number of requirements. But it is not at all clear costs are considered when making decision to increase online course offerings.

Another frequently expressed concern on the part of traditional faculty is that a move toward online delivery will result in the elimination of faculty positions thereby lessening instructional quality. These concerns are unfounded. With the exception of a handful of (typically) for-profit institutions, no institutions of higher education in the U.S. are considering moving all of their programs online. The increased course catalog which can result from offering online along with face-to-face classes in fact requires more, not fewer, faculty. One of the expressed rationales for institutions offering online courses is the desire to increase enrollment. Small to mid-sized non-urban institutions, in particular, describe enrollment growth as their primary motivation in moving online. This was echoed in the responses of the certain interviewees in this study.

By contrast representatives from the larger, primarily urban, institutions cite space constraints as the key driver toward the use of online courses. Growing enrollment, combined with the inability to expand the physical campus or a lack of financial resources required to construct new classroom buildings has the effect of

over-subscribing existing classrooms. An additional constraint is that many students (not to mention faculty) simply do not want to attend face-to-face classes at inopportune times (early mornings, late evenings, weekends, etc.). The result is a drive to provide online options –either through fully online courses or through hybrid courses where some portion of the class is taught online and some portion is face-to-face.

Access is an almost universal motivation to make courses and programs available online. Access in this context means the ability to reach new audiences. Online courses can make higher education available to students who are constrained by time and geographic location. The profit motivation to offer courses online is still present, but it is not as explicit as it was in the late 1990's when the novelty of such programs contributed to an abundance of unsupported hype regarding their potential. The ensuing decade was one of consolidation and/or elimination of several of the early entrants into online offerings. Once the easy profit sentiment proved to be unrealistic, the result was a new-found cost consciousness among colleges and universities undertaking online programs.

At the time of this writing, there is a deep economic recession taking place and campuses are taking a very close look at their budgets with an eye toward restraining cost increases and reducing specific cost elements wherever possible. Knowing whether online delivery is cost effective has never been more important. There are growing external calls for transparency and accountability from the general public and government institutions. This fact argues for a deep understanding of the internal cost structures on each campus. Making well informed resource allocation

decisions is becoming increasingly important, rather than continuing to fund programs based on historical costs and revenue estimates. For these reasons, understanding the differences in delivery costs between online and classroom delivery is an important institutional activity.

Despite the pressure to identify internal costs, it is clear from this study that costs per course are not being accurately captured on most campuses.

Administrators appear to have a good handle on the broader cost picture, and their data gathering and reporting systems support that broad cost understanding. And while costs can be easily parsed on the administrative side of the institution, for the academic side of the enterprise there appear to be both cultural and informational barriers to understanding them. This is not just an issue for online courses, as institutions do not tend to capture costs on a class by class basis regardless of the delivery mode. But given the interest in and visibility of online courses, the cost question is most frequently asked about that mode of instruction while it is felt to be better understood for classroom courses.

It is apparent based on the interviews conducted for this study that there in fact may be some liability associated with producing a class by class cost report. Such a report would almost certainly show a wide variance in cost across the various academic departments, and might also show a large variance in cost across delivery modes. There might be nothing wrong with having a cost variance across departments, (it is easy to conceive that a chemistry wet lab class will be more costly than an English composition class,) or delivery modes. But the interviewees indicated that such a report would, on the face of it, appear to show cost



inefficiencies and therefore present problems if viewed by people outside the institution.

There was remarkable consistency among the interviewees regarding cost in the decision making process. All indicated that it was but a minor factor in academic decision making and was outweighed by any number of other factors. They were cognizant of broad costs issues but did not have a deep understanding of the underlying costs associated with course delivery – for either face-to-face or online courses. In one sense cost had been moved to the bottom of the set of decision factors because development and delivery costs had become conflated. That is, when online courses were discussed by the interviewees, most did not conceptualize a difference between the one-time costs of course development and the ongoing costs of course delivery. When viewed in this way, it appeared there was more consensus behind the idea that online courses were more expensive than face-to-face instruction.

Virtually all institutions of higher education in the U.S. have invested in a course management system, or CMS, which represents a significant investment. The CMS is used primarily to support classroom instruction by providing a common place for course materials to be housed. Some small fraction of classroom instructors use the CMS to assist in instructional activities directly. In a real sense, then, online courses and programs which are offered using this existing infrastructure can be thought of as increasing the cost efficiency of those resources. Several of the interviewees commented on the use of institutional sunk-costs as a form of leverage upon which online instruction can be offered cost effectively.

### *Suggestions for Further Research*

This study was an exploration of the underlying costs associated with course delivery in both the traditional classroom format and the completely online format. The study also explored how campus administrators use such information in academic decision-making.

In order to create an inter-institutional measure of cost-per-semester credit hour, a detailed examination of specific costs could have been provided by activity based costing (ABC). However, this was not done. Instead consistent public data sources as represented by the institutional annual financial reports were used. As noted in Chapter 2, ABC has significant conceptual advantages in detailing expenditures of discrete processes. However, most ABC studies in the higher education literature focus on individual campuses. Because of the subjectivity of what costs (or percentage of costs) are allocated to the instructional activity on particular campuses, it would be very difficult to conduct an inter-institutional ABC study focused on course delivery cost. Nevertheless, such a study should be attempted.

There are admitted weaknesses in the quantitative portion of this study. The cost comparison between the calculated cost/SCH for classroom delivery and the cost/SCH of online delivery is not an “apples to apples” comparison because of the nature of the campuses and the centralized online unit studied. The cost categories associated with the annual financial reports of the institutions and the budget of the centralized online unit did not exhibit a one-to-one relationship. There were some centrally subsidized costs which were not represented in the online unit’s budget

such as office space and utilities, although this cost is not estimated to be large enough to materially affect the calculated result. A closer examination of the specific costs associated with the structure and operation of a centralized online support unit would be an interesting and beneficial further research study.

A more fruitful line of investigation might be related to the role of cost in academic decision-making. This study concluded that cost is but a very minor consideration when other factors such as access, growth, or space constraints are also included in the decision matrix. An examination of the mechanics of academic decision-making, as it relates to deployment of online or hybrid courses and programs would be of great interest.

One of the underlying assumptions behind William Baumol's "cost disease" theory is the idea that, in certain economic sectors like higher education, technology has not been able to increase the productivity of the enterprise which results in consistently increasing costs. A fundamental research question, then, would be whether the technology and pedagogy of online instruction can affect productivity and thereby reduce costs.

It is clear from the interviews conducted in this study that campus policy makers have certain pre-conceived notions regarding both the cost and quality of online instruction. A particularly interesting avenue of exploration would be an analysis of the impact of these attitudes on the amount of online instruction delivered by their respective institutions. Do those administrators with favorable views regarding online instruction work at institutions which offer a large amount of online courses? What about those administrators who have a less than favorable view of

online instruction – what impact does that have on their campus strategic plans? Is there a correlation between campus leaders’ attitudes concerning online instruction and number of course offerings using this delivery method?

This study indicated no close correlation between institutional mission, as represented by Carnegie classification, and the cost/SCH of classroom instruction. This study did not directly compare the number and scope of online course offerings among the institutions studied. However, there did appear to be some correlation between the mission and the number of online courses offered, and perhaps some correlation between the mission and the breadth of online course offerings. Whether this apparent correlation, in fact, exists would prove to be a useful study. Further investigation of this seemingly simple question could also provide a valuable background to the appropriate “fit” issues. Additional questions quickly fall from this type of investigation: are there particularly well-suited (or ill-suited) disciplines for online delivery? To what degree do the core academic offerings – meaning those common courses all undergraduates must take – lend themselves to online delivery?

Given the well documented divergence in learning styles and facility with technology between the so-called millennial generation, generation X, and the baby-boomer generation, (Oblinger & Oblinger, 2005; Prensky, 2005 et al.) it seems reasonable to ask whether online courses deliver equally well for these different groups. Is there variance in learning outcomes between these groups in online courses? What are the optimal instructional design issues for online courses for each age group? If there is a difference, should that have an impact on the strategic planning for an institution regarding deployment of online courses and programs?

Hybrid, or blended, courses which are designed to combine classroom, face-to-face instruction with online instruction appears to be the fastest area of growth in higher education right now. Indications are that such courses not only have superior learning outcomes than either completely face-to-face or completely online courses, (Rovai & Jordan, 2004) but they also appear to be quite popular with students. Many of the same questions posed above can and should be posed regarding hybrid delivery. In particular, how might costs be allocated and accounted for regarding hybrid courses and how does that compare to both traditional and online instruction? Are these courses cost-efficient? What are the implications of hybrid delivery for enrollment growth and campus space constraints?

Finally, time studies of instructor workload inside online courses – using various pedagogical approaches – would help respond to the frequently stated contention that it is more time consuming, and therefore more costly, for faculty to teach online than in face-to-face courses.

### *Summary*

Many of these potential research investigations are predicated on the notion that online is still the “other” way to deliver instruction, and that it must be judged only in contrast to traditional classroom based learning. This “otherness” of online instruction has led, over time, to a high degree of inspection and oversight. It is fair to say that online courses are more accountable than their classroom peers. This is due both to a certain level of unease on the part of accreditors and some administrators and many faculty members. Online programs can be said to lead the

way regarding accountability measures, and this aspect is worthy of further exploration.

Nevertheless, this “compare/contrast” approach to research regarding online delivery, while seeking to prove that online instruction is “as good as” face-to-face instruction, only solidifies the status of online delivery as instruction outside the academic mainstream. While other instructional technologies have historically tried to enhance or expand the capacity of the lecture format, the pedagogy of online instruction is a very different approach to delivering college level education. And that really is the point. This kind of instructional delivery is here to stay, and its characteristics – academic and financial – must be better understood. Online instruction will continue to play an important and expanding role in higher education. We need to know more not about its “otherness” but about its ability to impact all facets of institutional performance and management.

## Appendix A

### *Interview Questions*

1. What role do online courses play in the strategic plan for your university?
2. Do you factor the delivery costs of offering online courses into decisions regarding whether or not to offer the courses?
3. In your opinion, are online courses more or less expensive to offer (not develop) than classroom instruction?
4. [Present and discuss the theoretical cost model] Would this type of model be beneficial in campus decision-making?
5. How do you feel about the use of the cost data (face-to-face vs. online) as presented, which is based on annual financial reports?
6. Does your institution have other available cost data for use in making classroom and/or online delivery decisions?
7. Is the decision to deliver online courses/programs in place of face-to-face courses/programs primarily a business or academic decision?
8. Does it matter to you (in your position) if there is a significant cost difference between online and face-to-face delivery?
9. What role do you see online delivery of courses and programs playing in the future of your institution? How does cost play into this future?
10. [Open ended request for final thoughts]

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## VITA

Robert Lloyd Robinson was born in Austin, Texas in 1962. He spent most of his early life in Bloomington, Indiana where his father was a faculty member at Indiana University. Robert graduated from Bloomington High School South in 1981 and returned to Austin to enroll in the University of Texas at Austin, where he received his Bachelor of Science in Radio-Television-Film in 1986. He worked for the University of Texas for several years, assisting in the operation of the telephone system on campus. Moving his young family to Columbia, Missouri to take a position with the University of Missouri in 1997 interrupted his progress toward his M.B.A. at St. Edward's University, which was finally completed in 2001 following his return to Austin. He has been employed by the University of Texas System Administration since 1999 where he is currently the Director of the UT TeleCampus, which exists to support online programs from all 15 University of Texas institutions.

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