

UMUC'S ONLINE MBA PROGRAM: A CASE STUDY OF COST-EFFECTIVENESS and the IMPLICATIONS FOR LARGE-SCALE PROGRAMS

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- "Ingredients" approach is detailed in the cost analysis of a new Online MBA
- Estimated costs and revenues for cohorts of 15 to 30 show why cohort of 25 was selected
- Implications for large-scale programs, like UMUC, indicate that cost examinations must include spillover costs to the entire institution, not just ALN course development and delivery (note: UMUC had nearly 40,000 online enrollments in 1999-2000).
- Cost effectiveness studies must be reassessed frequently for validity and decision-making value

I. INTRODUCTION

A. UMUC and the Graduate School

University of Maryland University College has a 53-year history of serving adult, part-time students. This non-traditional student population has provided the university with the unique opportunity to explore a variety of course delivery methods. As a result, UMUC has offered undergraduate courses for many years through such alternative delivery modes as voice mail, interactive television, and interactive video networks.

In 1996, the Graduate School offered its first asynchronous learning course. That initial foray into ALN graduate-level courses began with a cohort of 19 American students who worked for the Department of Defense and resided in Okinawa, Japan. The Graduate School viewed the development and delivery of a completely computer-conferenced course as a unique opportunity and agreed to pilot one ALN course in the Information Technology Studies department. Since that modest entrance into the world of ALN, the Graduate School has added a wide range of courses and programs to its distance education inventory.

The Graduate School currently offers 12 complete degree programs with 19 specialty tracks asynchronously online. Of those degree programs, two were designed originally for ALN delivery: the Master of Distance Education and the MBA. The other nine degree programs in the Graduate School were offered first in the traditional classroom format and were converted later to online delivery.

B. Master of Business Administration Program

The features of, and the demand for, the online MBA are appropriate for this particular cost study. Since its availability in the fall of 1999, the demand for this fully online program has exceeded the enrollment projections for each term. The online MBA program is an innovative, competency-based program that blends theory with practice. This is a cohort program consisting of groups of 25 students who progress through the program in a two-year period. The MBA degree program is 42-credit hours consisting of seven seminars of six credits each. As with other Graduate School course offerings, the target audience is mid-career professionals who continue working while pursuing advanced education.

II. BACKGROUND

A. History of Asynchronous Learning at UMUC

UMUC offered undergraduate courses through alternative delivery modes for many years prior to 1996. These voice mail, interactive television, and interactive video network courses were housed in the university's Open Learning unit and delivered only for undergraduates. Since 1996 when the Graduate School first entered the ALN environment, online offerings have grown exponentially at both the graduate and undergraduate levels. In 1999-2000, for example, the university offered over 1200 undergraduate and graduate sections online from the Maryland campus. During that year, UMUC's Graduate School offered more than 90 different graduate ALN courses. In spring 1996, ALN enrollments represented only 2% of the total graduate enrollments; by spring 2000, the number rose to almost 40%.

B. Enrollment in Asynchronous Graduate-Level Courses

Growth in graduate online enrollment has been phenomenal in the four years following the first ALN course offering in 1996 (see **Table 1**). Between 1998 and 2000, graduate online enrollments grew from about 1300 enrollments to more than 6300. Initially, most of the enrollments were within region (77%). Students in Maryland and the metropolitan Washington, D.C. area represented the majority of UMUC Graduate School enrollments in online courses.

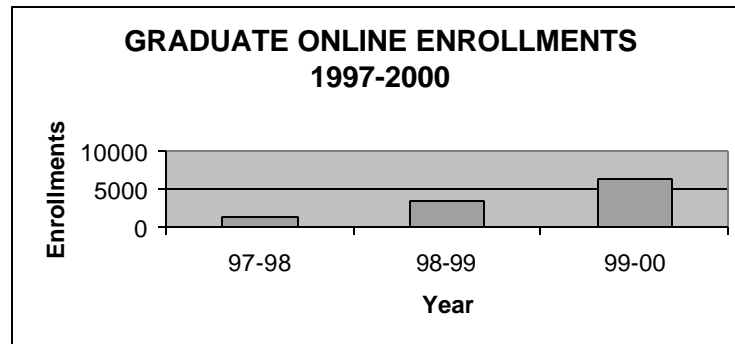


Table 1

Currently, Maryland residents comprise about 60% of the Graduate School's online population. As **Table 2** shows, the proportion of non-resident student enrollment has increased substantially since UMUC first began offering ALN programs. The reach and range of student enrollment now spans the globe and includes students residing in such areas as the Middle East, Asia, and Russia. Online enrollments are expected to increase to over 60% of total Graduate School enrollments in academic year 2001, with the new growth anticipated in out-of-region students.

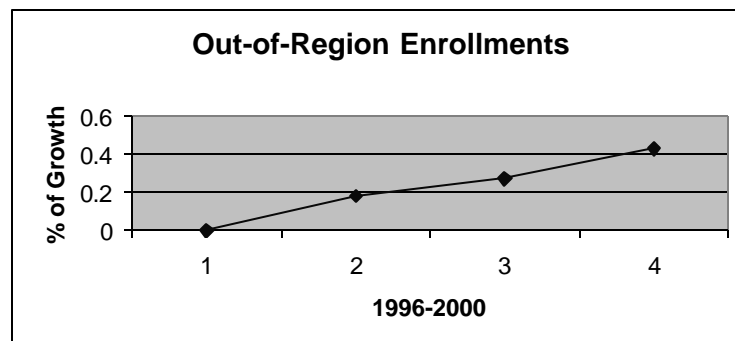


Table 2

III. THE ONLINE MBA CASE STUDY

A. Purpose

Faculty and student support for the MBA, in both traditional classroom and online modes, existed before the introduction of this program. Competition among MBA programs throughout the metropolitan area, as well as within the University System of Maryland, deterred UMUC from entering the market earlier. The ALN delivery model provided UMUC with the perfect opportunity to enter the MBA marketplace and, at the same time, addressed the growing demand of working adults for graduate educational opportunities offered without the constraints of time and place.

B. Cost-Effectiveness Objective

Following the determination of sufficient market demand for this new product, the Graduate School developed a formal program proposal. The proposal included a cost analysis to project the fiscal viability of the program, as required by the university administration. UMUC typically applies a return on investment approach prior to developing new programs. This cost approach evaluates the educational product based on its profitability, both internally and externally. From an institutional management perspective, the university focuses primarily on whether or not the investment ultimately will increase UMUC's profitability, or revenue. An underlying assumption is that new university programs also support the economy of the state and beyond by evaluating ". . . education as an investment which increases earnings" (Barrios & Davis, 1980). That is, the increased earnings potential of MBA graduates would contribute to the state's economy.

With this focus on return on investment, the MBA proposal included an analysis of cost recovery over a five-year period. The analysis projected a net loss in Year 1 with a modest net profit gain beginning in Year 2. The projection showed a continued increase in the net profit margin over the remaining three years. (The anticipated return on investment is depicted in **Table 3**.)

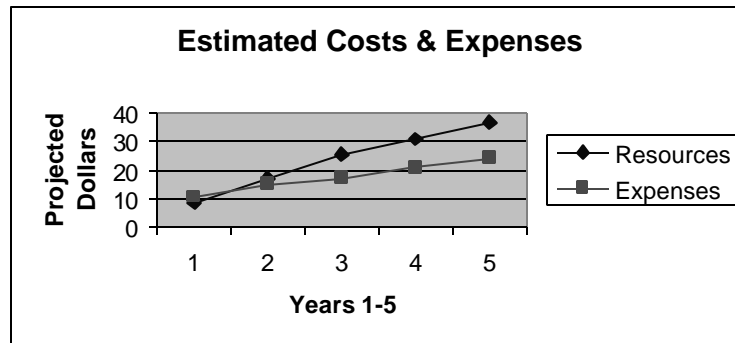


Table 3

This quick return on investment largely rested on the two key assumptions: 1) that a large market for an online MBA existed; and 2) that UMUC would utilize a number of internal resources to maximize cost-effectiveness.

In 1998, the Graduate School's marketing department fielded hundreds of inquiries from prospective students worldwide who sought information about both traditional classroom-based and online MBA programs. That same year, UMUC commissioned a market research company to survey specific product demand. Respondents to that survey overwhelmingly selected the MBA as their preferred graduate business degree program. Those data supported both the state and national growth trends reported by the Council of Graduate Schools. Although a number of sister institutions in the University System of Maryland offer MBA programs, UMUC viewed its offering as unique. Specifically, this MBA program would address market demand worldwide by providing a completely *online degree* designed especially for working adults seeking part-time study. UMUC's Graduate School viewed the online MBA program as a way to broaden access to graduate education.

UMUC's innovative MBA also offered an opportunity to update the Graduate School's inventory and reallocate faculty resources. Those factors were important considerations since some programs had declining enrollment. The introduction of the MBA provided a cost-effective model that could meet program demand and, at the same time, offer new intellectual challenges to the graduate faculty. The intended result was a refreshed program inventory with an increased revenue stream.

III. METHOD

A. Cost Analysis

According to Woodhall, “cost-effectiveness is a technique for measuring the relationship between the total inputs, or costs, of a project or activity, and its outputs or objectives” (1995:348). Typically, there are two approaches to this analysis. One way is to compare “alternative ways of achieving the same objective” while the other is to compare two or more products to determine “... which achieves the highest level of output or results” (Woodhall, 1995:348). UMUC’s Graduate School applied the former method by using the “ingredients” approach.

The first step in the process was to identify what the costs would be for developing and delivering the entire 24-month program to one cohort. The estimates are calculated based on alternative cohort sizes of 15, 20, 25, and 30. A presentation of these data allows decision-makers the opportunity to examine the array of alternatives and determine an appropriate course of action. **Table 4** below details the cost inputs associated with the program development and course delivery, based on varying class size. The inputs detailed in the table represent the “ingredients” approach to cost analysis that Levin (1983) introduced. This framework is applied widely in cost studies and includes the itemization and calculation of all the resources (ingredients) and associated costs of a project or program.

**Estimated Program Costs & Revenues
of Delivering a Cohort Online MBA Program
(22-month program)**

Cost Per Cohort	Cohort = 15	Cohort = 20	Cohort = 25	Cohort = 30
Faculty salary*	\$ 105,000	\$ 105,000	\$105,000	\$ 105,000
Faculty training	1,500	1,500	1,500	1,500
Online teaching stipend	3,900	3,900	3,900	3,900
Course development	35,000	35,000	35,000	35,000
Instructional designer	4,000	4,000	4,000	4,000
Course evaluation	200	200	200	200
Peer review	3,500	3,500	3,500	3,500
Electronic library costs	2,145	2,145	2,145	2,145
Program coordinator **	40,000	40,000	40,000	40,000
Online student services	5,850	7,800	9,750	11,700
Web administration	7,000	7,000	7,000	7,000
IT help desk support	19,995	26,660	33,325	39,990
Marketing	50,000	50,000	50,000	50,000
Subtotal	278,090	287,420	296,750	306,080
Administrative overhead	27,809	28,742	29,675	30,608
Total Cost	305,899	316,162	326,425	336,688
Projected Revenue***	283,500	378,000	472,500	567,000

*Assumes program director salary, benefits and percentage of time allocated to a single cohort for life of program (22 months). Also includes part-time faculty salaries.

**Assumes program coordinator salary, benefits, and percentage of time allocated to a single cohort for life of program (22 months).

***Projected revenue is based on the number of students in the cohort times the tuition rate.

Table 4

Numerous inputs are considered in the Graduate School cost model, as illustrated above. The resource requirements for new program offerings are estimated from a variety of data sources. Faculty and staff salary calculations are straightforward and derived from the workload projections. In **Table 4** above, faculty and staff salaries represent the portion of time that will be dedicated to a single cohort (over the life

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of the cohort) and prorated accordingly. Some other costs are fixed, such as the online teaching stipend, peer review, and course evaluation. All of those costs are based on an established per course figure.

Some other costs are calculated as a percentage of a unit's total budget. For example, online student services costs are calculated as a percentage of the total budget for the Graduate Student Services unit. Faculty training costs are based on a portion of the Center for Teaching, Learning, and Assessment budget, and web administration is calculated as a percentage of the Information Technology unit expenses. IT help desk support is subcontracted and therefore reflects a fixed per student cost. Once the marketing effort level is established, the marketing director provides estimated costs based on the type of advertising required for the new product, such as direct mail, brochures, web, and print media. The administrative overhead represents the costs associated with the percentage of time others spend in support of the program. This cost "ingredient" includes, for example, deans, department chairs, and other administrative staff.

The university typically does not underwrite the start-up costs of new programs. In large part, this is a business decision based on the limited state funding that the institution receives annually.¹ The funding pattern, as well as the institution's entrepreneurial culture, requires that new programs provide evidence of both scalability and profitability. An examination of the estimated data presented in **Table 4** shows that the university could expect a small profit with an online MBA program cohort of 20. The margin of profit, however, is extremely narrow. Although the profit margin for a cohort of 30 realizes the greatest net gain, the university decided that the ideal class size was no larger than 25. The 25-student cohort option appeared both fiscally viable and pedagogically sound.

Up to this point, the cost analysis discussion has reflected cost-effectiveness only. A cost-benefit analysis is more appropriate when examining the costs to the student as well. On the cost side, that type of analysis would include both the direct costs of the program (tuition and fees) and the opportunity costs (for example, the time the student spends while engaged in the program rather than engaged in some other activity). The quantifiable benefits to the student would be the increase in earnings from the time of the degree completion until career retirement as well as career promotion (Levin, 1983). Additionally, non-quantifiable factors, such as satisfaction, might be arrayed (Gramlich, 1984).

UMUC did not complete a cost-benefit analysis for the online MBA program. Since the university operates from a "return-on-investment" perspective, the analysis did not include an examination of the range of possible benefits to the student and his/her family that economists such as Wolfe (1995), Coombs and Hallak (1987), and others apply. Based on the market survey mentioned previously, there was an underlying assumption of value in degree attainment. The Graduate School seeks validation of degree value and, toward that end, surveys its graduates to determine the impact, or benefit, the degree has on their career advancement and goals. UMUC includes information related to such benefits in various program materials.

As part of an overall cost analysis, the UMUC Graduate School did conduct a competitor analysis to determine the tuition range for other comparable online programs. The range from that analysis revealed a low rate of \$155 per credit hour to a high of \$996. The mean tuition of the 29 competitor online programs examined was \$452.

The UMUC Graduate School proposed a pricing structure for the online MBA program that would be profitable to the university while competitive in the marketplace (based on the results of the market survey mentioned earlier). The tuition for the program was based on those factors, and the rate was established about 24% higher than the Graduate School's regular non-resident tuition.

At present, the online MBA is offered only in an ALN format. Therefore, there is no opportunity currently to examine and compare ALN student learning outcomes with those of traditional classroom students.

¹ UMUC currently receives only around 10% of its stateside budget from state funds. Although the state funding formula is improving, for most of the 1980s and 1990s the state contribution was negligible. Thus UMUC necessarily has always followed a business "return on investment" financial model.

According to James Mingle, a senior policy adviser for the Southern Regional Education Board's Distance Learning Policy Laboratory, "The challenges of measuring and identifying student learning and attributing that outcome to particular practices are as difficult in a distance-learning environment as in a traditional classroom" (Carnevale, 2000). It appears likely that continued investment in the technology required for distance delivery will require further evidence of positive learning outcomes and gains.

UMUC's Graduate School has just begun an executive version of the online MBA program. That model combines the traditional classroom setting with the ALN delivery format. The executive MBA will provide an opportunity for the university to compare costs and learning outcomes of the mixed delivery model with the fully online program. There are key demographic differences, such as the level of management and professional experience, between the "regular" and "executive" student populations; however, the differences might suggest the need for some caution in comparing costs as well as learning outcomes.

B. Technology and Infrastructure

UMUC offers its ALN courses, both graduate and undergraduate, through its proprietary WebTycho™ delivery platform. This system has been developed in-house and has evolved over the course of many years from DOS, through Windows, and now to a Web-based environment. In the initial planning of UMUC's online MBA program, the key concern was whether or not the technological infrastructure would be able to support the extra demands on the system. UMUC's IT team determined that the university's network servers would be able to support this additional online growth and that no additional hardware or software would be required. UMUC subcontracts computer help-desk support for students and faculty to maintain 24-hour assistance. The projected additional service charge was included in the cost analysis.

C. Content Delivery

The UMUC online MBA program is delivered in module format, of 6 credit hours each, to the student cohorts. Since the program design is accelerated and offered in an uninterrupted 24-month schedule, students must keep pace with the established schedule. The seven requisite six-credit seminars are 12 weeks long with two weeks off between seminars.

The online MBA program employs a variety of content methodologies in delivering this degree program. The highly interactive structure of the program requires individual and student team participation throughout the program. Faculty post weekly lectures and discussion questions. Student performance is based on the results of their exams, quizzes, and research papers as well as the quality of their class participation as individuals and in groups. There is no face-to-face component requirement in the program.

D. Organization and Evolution

The course development process for the online MBA program has varied. While some segments have been designed by a single individual, the development more typically reflected an interdisciplinary team approach. For any given module, a team of 3-5 faculty designed the course syllabus and determined course content and materials. The team then vetted the content with peers before presenting it to the Graduate Council (the curriculum approval body). UMUC also employed graduate assistants to develop and test software –like CD-ROM course materials. Distance education coordinators, who provide instructional design support for each department, assisted with technical support and production.

The Graduate School allocated around \$30,000 per module for the course development costs. That figure included internal resources such as faculty and staff release time. The Graduate School offset this expense with cost savings that had accrued from the delayed hiring of other positions.

IV. RESULTS

A. Achieving Financial Goals

Since the online MBA program has been offered only one academic year (1999-2000), it is premature to draw conclusions about its overall financial success. The data from this initial year, however, do provide

some insight regarding fiscal viability at this point. They also offer some measure of predictability for the future. Based on first year projections, the actual enrollments were more than 92 percent greater than expected. Program costs, however, did not increase exponentially with that demand. The extra costs associated with providing sufficient infrastructure to meet increased student enrollments accrued primarily in IT help desk and student services support, materials and supplies, and additional faculty release time.

Both the continuing and new student enrollments for the online MBA look strong as the program moves into its second year. The first year revenue greatly exceeded the projection prepared in the original cost analyses. As a result, the return on the initial investment already reflects positively. There are nevertheless areas that need continued attention. For example, it is difficult to determine at this point when the level of growth for the online MBA program will stabilize. In the meantime, the costs are not static. The enrollment growth requires additional resources, including full-time faculty and staff, as well as further release time for some existing staff. Teaching assistants also are being added in Year 2 to help faculty with the additional workload demands.

Some of the increased expense in the first year of offering the online MBA is a result of the process changes inherent in new program development and delivery. There is a level of trial, error, and adjustment that occurs with the implementation of a new product that must be taken into consideration. Unfortunately, many managers focus solely on the initial cost analysis prior to the introduction of a new program and do not conduct any further analysis. As this case study suggests, it is very important to reexamine costs periodically after the implementation to determine where calculations might need readjustment. Such follow-up analysis can yield important comparative data regarding the projected and actual costs as well as better inform future cost study analyses.

B. Implications for Large-Scale Programs

The MBA program is one of 25 programs that UMUC currently offers completely online. Enrollments have expanded dramatically in the last four years since the first ALN program. For example, ALN enrollments grew from 408 in spring 1996 to more than 13,000 in spring 2000. The proportion of ALN enrollments rose from 2% of the total in spring 1996 to 40% in spring 2000. In annual figures, ALN enrollments increased from 3800 in 1996-1997 to nearly 40,000 in 1999-2000. The number of sections (USA-based²) has grown from 283 in 1996-1997 to 1223 in 1999-2000. The average number of courses offered also has increased from 57 to 193 in that same period. At the same time there has been an increased demand for ALN services throughout UMUC's educational environment regardless of course delivery mode. Student services, admissions, advising, registration, library, textbook purchases, and the staff who support these functions are available online, and used by *all students*. These services are in addition to those most often directly associated with ALN programs, such as course development and delivery, copyright approval for online course materials, faculty recruitment and training, faculty salaries, IT infrastructure, and 24/7 technical support. At UMUC, the ALN course environment is no longer separate and distinguishable from the functioning of the university. For example, most students who take face-to-face courses expect convenience and want to use the electronic services originally developed for the online student, such as registration and library research.

This means that for a large-scale ALN institution, such as UMUC, cost analyses must include closer examination of costs to the entire institution, not just those most obviously linked to online course development and delivery. At UMUC, new ALN costs have resulted from student demand as well as institutional policy changes. For example, the majority of all UMUC students choose to register online, and this has resulted in the need for more student services personnel, quicker response time to questions, and 24/7 availability. Thus, the convergence of the online and traditional environments has made it very difficult to easily disaggregate the costs associated with only one modality.

Recent ALN policy changes at UMUC also have impacted costs. For example, all students now must take a non-credit online, self-paced information resources tutorial before completing six credits. The costs related to this policy —content development and annual updating, instructional design, substantial

² UMUC has campuses based in the USA, Europe (Heidelberg, Germany), and Asia (Tokyo, Japan). The above data are from the USA headquarters only.

technological support, and staffing — are not recovered by the minimal course fee (\$75). In this instance, however, the return on investment is related to the institution's broader mission of graduating technologically literate students.

V. CONCLUSION

The online MBA, as a case study, provides a “snapshot” of the costs associated with the development and implementation of a new ALN program. Such studies only capture the financial picture at a particular moment in time. In the highly dynamic online educational environment, the predictability of the model is necessarily short term and therefore must be reassessed frequently. For example, data in the MBA show significant differences between projected and actual revenue figures in the first year of operation. In addition, this MBA study demonstrates how the program costs are inextricably linked to the rest of the institution's ALN functions, such as electronic library resources and online student services.

Determining cost-effectiveness of the ALN environment is complex. One reason is that the continuously changing nature of technology makes it difficult to assess accurately long-term costs. Not only does the cost of hardware and software frequently fluctuate, but the competitive IT marketplace also makes projecting salary expenses challenging. For example, IT and instructional design staff are frequently lost to competitors. Additionally, faculty who teach online require additional funds (for online teaching stipends) and often release time. Moreover, new cost ingredients such as “intellectual property” need a conceptual framework for cost analysis because issues such as “course content ownership” have not been clearly defined or quantified. The resolution of this issue is not just financial but one that is in constant negotiation among the parties within an institution. These developments mean that cost-effectiveness studies must be frequently reassessed for validity and for appropriately informing decision-makers.

Attempts to identify, project, and control ALN costs are fostering dialogue among institutions that want to understand how to quantify these new areas. Inglis (1999) and others have observed the need to engage in such conversation. The high cost of delivering quality ALN in a competitive marketplace also has resulted in some collaborative activities. For example, the University System of Maryland institutions have joined in purchasing electronic information resource databases, thus lowering the costs for individual schools. The costs associated with UMUC's large-scale ALN environment indicate both the complexity of the issues and the integral nature of its relationship with the development, delivery, and maintenance of quality higher education today.

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