THE VIRTUAL
UNIVERSITY

| Models & Messages | Lessons from Case Studies |

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An evolution of an existing institution

UNESCO

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List of abbreviations

ILS   (Office of) Information and Library Services

IT   Information Technology

MDE   Master of Distance Education

ODELL   Office of Distance Education and Lifelong Learning

UMUC   University of Maryland University College

USM   University System of Maryland

1.   UMUC and its context

According to its official mission statement, the mission of University of Maryland University College (UMUC) is to provide:

> …high-quality academic programs and outstanding faculty, products, and services to students and clients, independent of time and place constraints. UMUC serves mainly adult, part-time students through both traditional and innovative instruction. UMUC offers associate's, bachelor's, master's, and doctoral degrees, certificates, and personal and professional development programs that respond to the needs of the lifelong learner. Degree programs are primarily in arts and humanities, behavioral and social sciences, business and management, computing, education, and technology. In addition, UMUC offers a professional doctoral degree in management.

> UMUC's statewide mission is to extend access to post-secondary educational opportunities for individuals who combine work with study, with a special emphasis on Maryland's professional workforce education needs. UMUC meets those needs through innovative online and classroom-based credit and non-credit programs, using a variety of delivery formats and scheduling options. Classrooms are located throughout the State at over 25 regional sites.

> UMUC's global mission is to sustain international eminence by extending access to American post-secondary degrees and non-credit programs worldwide. UMUC's international mission is twofold: to serve US citizens and their families overseas and to expand into international markets that, in turn, will enhance Maryland's economic development as a center for global commerce.

Throughout this case study it will be emphasized that UMUC's virtual university initiative was launched in support of this mission.

1.1   International context

UMUC has set for itself the goal of becoming and remaining "the benchmark global university" by extending access to American post-secondary courses and degree programmes worldwide. To accomplish this, UMUC pursues two primary international objectives as described in the mission statement quoted above:

- to serve US citizens and their families overseas, and
- to expand into international markets.

As a result of its fifty-year history of offering courses and programmes to US military personnel overseas, UMUC has in place a worldwide infrastructure of academic and student services to meet the first objective (see Section 2.2 below). In pursuit of the second objective, UMUC makes great use of the online courses and degree programmes it has developed over the past eight years as part of its virtual university initiative. It also enters into cooperative relationships with multinational organizations and foreign universities (see Section 5 below).

1.2 National context

Higher education institutions in the USA have traditionally delivered courses and degree programmes to full-time, often resident students between the ages of 18 and 22. Various practices in higher education, as well as state and federal laws related to such matters as financial aid, have been shaped by this tendency. For example, many US colleges and universities schedule the majority of classes at times and in places that conflict with typical work hours and locations. This has the effect of discouraging (if not altogether preventing) members of the workforce from pursuing higher education opportunities. Further, this has fostered a belief on the part of many Americans that higher education is something one does for a few years in one's youth, after which one moves on to work and never enters a university classroom again. This belief is in sharp contrast to the reality that, thanks to changes in technology and management principles, and to the globalization of the economy, American workers in all sectors find that they must continually update their general and specific skills and areas of knowledge in order to remain productive and competitive.

Ensuring quality in US higher education is largely the responsibility of a group of independent accrediting agencies that operate with the approval of the US Government. The most influential of these agencies are the six 'regional' accrediting bodies; the government relies on their oversight and judgement of the quality of education or training offered by the institutions they accredit. These organizations have been influenced by the traditional US view of higher education, described above, in their creation and evaluation of standards of quality.

A great deal of the financial aid available to university students in the USA is administered in accordance with the regulations of the US Department of Education, which in turn depends on legislation enacted by the US Senate and House of Representatives. These regulations also tend to reflect the traditional higher education environment; they sometimes fail to take into account the situation and needs of part-time adult university students and the institutions that provide courses and programmes to them. For example, the US Congress has not yet officially recognized online delivery of courses as equivalent, for financial aid purposes, to traditional 'face-to-face' classroom delivery. This has important financial aid eligibility implications for the rapidly growing population of online students.

UMUC has emerged as a leader among the American colleges and universities that have run counter to this prevailing view by specializing in providing higher education opportunities to persons who are older than the traditional college student, and who already have full-time jobs. Such 'non-traditional' students, as they were once known, are often unable to attend classes during the day because of their professional obligations and/or the fact that they live far from a college or university campus. In addition, the professional and personal obligations of such students typically leave them time to devote to only one or two courses in a given term; hence their classification as 'part-time' students.

In order to serve this population of adult, part-time students, UMUC developed delivery models and administrative mechanisms, the goal of which is to increase access to higher education opportunities. For example, UMUC makes use of weekend and evening courses, accelerated courses, courses taught at locations remote from the university's main campus, and courses delivered via technological means to remove the barriers of time and place that can prevent adult workers from participating in higher education. UMUC has also created efficient, technology-mediated systems for providing students with the academic and administrative services they need for a successful education experience.

In the past these efforts have been hampered somewhat by the traditional US view of higher education described above, but leaders in US higher education and government have begun to take an interest in non-traditional education and the institutions that provide it. Because of the tremendous size and success of its virtual university effort, UMUC has assumed an increasingly important role in shaping the national debate about the quality of online higher education and the importance of 'lifelong learning'.

1.3   Institutional context

UMUC's virtual university is not a separate entity within the institution. Rather, the use of distance learning modalities, such as the Internet, is one way in which UMUC fulfils its mission.

UMUC is one of the eleven degree-granting institutions that constitute the University System of Maryland (USM). Of those eleven institutions UMUC is the only one committed from its inception to the use of non-traditional delivery methods in order to provide access to part-time students. UMUC offers a range of degree programmes similar to that of other American universities: undergraduate programmes leading to bachelor's degrees in a variety of fields, and graduate programmes leading to master's degrees and, in the field of management, a doctoral degree. It also offers both bachelor's level and post-bachelor's certificates in a number of academic areas; these certificates usually require the completion of a smaller number of credit-bearing courses than do the degree programmes and frequently have an applied, workforce-based focus.

In order to make maximum use of its flexible delivery models UMUC employs both full-time faculty and 'adjunct', largely part-time faculty.[1] The collegiate professors fill many of the same roles at UMUC as do tenured or tenure-track faculty at research institutions: administration of academic departments, course development and revision, teaching, and research. Almost all collegiate faculty hold a terminal degree (usually the Ph.D. or equivalent) and have years of relevant experience in higher education.

Adjunct faculty members are persons with appropriate academic and professional credentials who are hired to teach individual courses and/or to participate in the course development process. Their full-time employment is often outside UMUC; they teach because they consider this to be important and are dedicated to carrying out this mission.

UMUC currently employs approximately 2,300 faculty worldwide. Of these, 23 per cent are full-time faculty; the remainder are mostly adjunct faculty, along with a small number of librarian faculty and professors of the practice. These faculty members serve a worldwide student body of more than 80,000 persons in 45 of the 50 US states and in 70 other countries. About 90 per cent of these students are pursuing undergraduate degrees or certificates; of those, more than 50 per cent are taking their courses online.

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[1]. The university has two additional faculty categories, librarian faculty and 'professors of the practice', which are considerably smaller and for reasons of brevity are not discussed in this paper. For further information see UMUC's policy on the appointment, rank and promotion of faculty at http://www.umuc.edu/policy/fac18100.shtml.

2. The creation and organization of UMUC's virtual university

2.1 Creation

UMUC's virtual university initiative began in 1994 when the institution created and launched a proprietary software system (now known as WebTycho) designed to deliver courses via the Internet. This initiative was a natural outgrowth of UMUC's use of a variety of course delivery models throughout its history. Prior to 1994, the institution relied largely on sending its faculty members out to various sites, both in the State of Maryland and in Europe and Asia, in order to reach students who would not otherwise have an opportunity to take university-level courses. Over the past 30 years it had also experimented with some of the available technologies – such as voicemail, interactive television, and two-way audio/video technology – to deliver courses to remote locations. Although none of these technologies proved to be ideal for the fulfilment of the university's mission (most have in fact been discontinued or are being phased out), the experiments gave UMUC faculty and staff important experience in the pedagogical and technical challenges of course delivery at a distance. In the early 1990s the university's leadership became convinced that the Internet would prove to be the most effective technological means to offer courses and programmes irrespective of time and place constraints.

That conviction was correct, as the institution's phenomenal growth in the years following 1994 demonstrates. In Fiscal Year 1994 UMUC had a total of 110 online enrolments.[2] By Fiscal Year 2002, the number of online enrolments worldwide had grown to 86,769. The demand for online courses led UMUC to convert 16 of its undergraduate degree programmes, all 17 of its master's degree programmes, and 38 of its 70 certificate programmes to an online delivery format. This required the creation, or conversion to online delivery, of more than 450 individual courses at both the undergraduate and graduate levels during the period 1994-2001.

It also required the creation of an enormous and complex mechanism for providing services to students who were not physically located at or near one of the campuses. For instance, the whole process of applying for admission, registering for classes, and obtaining financial aid when necessary had to be adapted for students living in other cities, states, or even countries. In addition to meeting these primary student needs, other services (such as academic advising, the ordering and distribution of textbooks, and the delivery and monitoring of examinations) had to be provided to 'distant' students. To further complicate the matter, students taking courses online had to have the same access to library services enjoyed by students who resided at or near their college or university.

UMUC now provides these services through a mixture of telecommunications and other technologies. For example, applicants for admission can fill out either an electronic application form via the web or a traditional paper application. Students can register for courses via the web, fax, e-mail, or interactive telephone systems; they may also use these means to apply for financial aid. Academic and career advising, as well as many of the other essential services described above, are also available in a variety of electronic formats.

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[2]. For the purpose of this paper, an enrolment is the action whereby a student registers for, and becomes eligible to participate in a course. Since students can register for more than one course in a given term, the number of enrolments is higher than the number of actual students.

UMUC's success in the provision of library services to distant students is particularly noteworthy. In the USA, the libraries of most colleges and universities now routinely use technology to facilitate such processes as journal searches and interlibrary loans. The principal holdings of such libraries, however, remain housed in a building to which students are encouraged to go to access the print (and growing digital) collections.

UMUC has taken a different approach in its virtual university effort. The institution's academic leadership knew that the university would have to provide as many library services as possible in an easily accessible electronic format, along with unique delivery capabilities for written materials and an integrated search feature for the growing number of online databases and electronic reserves.

UMUC's Office of Information and Library Services has developed an impressive array of such services. UMUC students have electronic access via the web to the library holdings of all eleven institutions in the USM. UMUC will ship USM library books directly to the homes of students and faculty. Full-text service is also available to online students for a considerable and growing number of journals. At present, UMUC students and faculty may choose from among more than 90 databases, nearly half of which provide access to full-text materials. Duty librarians provide '24/7' (twenty-four hours a day, seven days a week) asynchronous service to students and faculty, and the university will soon move to 24/7 synchronous service. For faculty the institution can obtain copyright permissions and digitize selected articles for required class reading lists.

UMUC has found that using digital resources for academic purposes is a skill that must be learned and practiced. To ensure that students can make full use of such digital resources, two online courses were developed (one for undergraduates and one for graduate students), which introduce students to electronic library and information resources. In 1998, UMUC's Graduate School made the course mandatory for all graduate students before they pass beyond the first six credits of programme work, and in 2001, the School of Undergraduate Studies made the course mandatory for all undergraduates (in their case, within their first fifteen credits with UMUC).

Lessons learned

The lessons learned by UMUC in the course of its development of a virtual university have been summed up by the institution's Provost and Chief Academic Officer, Dr Nicholas H. Allen, as follows: "Any institution planning to start up a virtual university must be prepared to make an expensive, long-term, institution-wide commitment to that effort." Successful entry into the virtual education field is not simply a matter of putting a few courses up on the web. Rather, it demands a fundamental change in the institution's approach to higher education in terms of both the academic content of courses and programmes, and the necessary concomitant services to students and faculty. It requires significant, continual investment in human resources and technology, as well as a commitment to regular assessment of the teaching and learning effectiveness of those resources. This is manifestly not a field for dilettantism.

2.2   Organizational structure

As mentioned in Section 2.1 above, the virtual university is not a separate entity within UMUC but rather one of modes to accommodate the needs of students who face time and place constraints in their access to higher education. It is therefore necessary to describe the

organization of UMUC's academic enterprise in some detail in order to see how the entire university participates in the initiative.

UMUC's main campus is located in Adelphi, Maryland, approximately twenty miles from Washington, D.C. This campus houses the offices of the university's President and its Provost and Chief Academic Officer, as well as the Deans of Undergraduate and Graduate Studies and their full-time staff. The units that are tasked with providing student services, faculty services, and library services are also located in Adelphi, as is the university's extensive Information Technology unit.

UMUC also has two large overseas operations dedicated solely to the delivery of courses and programmes to US military personnel and their families. UMUC-Europe, which is headquartered in Heidelberg, Germany, oversees courses and services on US military installations in twenty countries including Bosnia, Greece, Saudi Arabia, Turkey, and the United Kingdom. UMUC-Asia, which has its administrative headquarters on a US Air Force base in Japan, fulfils a similar role in, for example, Thailand, South Korea, Singapore, and Okinawa. Until recently, the overseas divisions have concentrated largely on delivering courses in the more traditional 'face-to-face' format. Albeit at a slower pace than in the USA, the use of online course delivery for this population of students is growing due to the convenience of this system for military personnel who must often travel at short notice.

The overseas divisions are under the administrative responsibility of the Provost and Chief Academic Officer, as are the School of Undergraduate Studies, the Graduate School, and the Office of Student Affairs (which includes admissions, registration, advising, and graduation). The Provost also oversees a number of academic support units, chief among which are the Office of Information and Library Services (ILS) and the Office of Distance Education and Lifelong Learning (ODELL).

ODELL is the only UMUC unit devoted solely to the virtual university effort. Within ODELL there is a research unit – the Institute for Research and Assessment in Higher Education – charged with studying the pedagogical exigencies of distance education and the 'non-traditional' student. ODELL also has a Center for the Virtual University, which evaluates new technical and pedagogical approaches to web-based learning, and a Center for Teaching and Learning, which assists UMUC's faculty in developing and enhancing teaching effectiveness in the online environment.

This centralized organizational structure has the advantage of allowing fairly rapid decision-making. The Provost and Chief Academic Officer sets the overall policy direction of UMUC's academic enterprise. The Deans and the heads of the support departments are responsible for the implementation of this direction and for the day-to-day operation of the enterprise. Final authority for changes to course content, degree programmes, and other academic elements rests with the Deans and the Provost, who draw upon the advice and counsel of faculty, staff, and students. To this end, UMUC's governance bodies – the Student, Faculty, and Staff Councils – were designed largely to give these three large 'stakeholder' groups an opportunity to advise senior university officials on both broad and specific policies and implementation procedures.

UMUC's office of Information Technology (IT), although not administratively under the responsibility of the Provost, is nonetheless a vital component of the virtual university effort (see Section 3.3 on technological infrastructure below).

2.3 Current programme

Through its virtual university, UMUC offers both bachelor's and master's degrees as well as certificates at both the undergraduate and graduate levels.

Of UMUC's 28 bachelor's 'majors' (primary fields of study) seventeen can be pursued fully online (that is, all courses necessary to complete the degree requirements for either a Bachelor of Arts or a Bachelor of Science can be taken online). Students also have the option of pursuing a fully online Undergraduate Certificate in one of twenty academic areas. Certificate programmes typically require the completion of eighteen semester hours (usually six courses) and are intended for working professionals who need to strengthen or update their knowledge and skills in a specific field.[1]

All seventeen of UMUC's master's degree programmes are available fully online as well. UMUC also offers certificates, varying in length from 12-21 semester hours (four to seven courses), at the graduate level.[2]

Nearly 90 per cent of UMUC's students can be categorized as adult part-time learners. The median age of UMUC students, both undergraduate and graduate, is 34. Approximately 57 per cent of undergraduate students and 49 per cent of graduate students are women.

UMUC continues to develop new courses and degree programmes at both the undergraduate and graduate levels. In the development process it is now taken for granted that the course/programme will be designed for online delivery in addition to any other delivery method that may be suggested.

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[1] For a complete listing of all undergraduate online programmes see http://www.umuc.edu/prog/ugp/ugp_de.html
[2] See http://www.umuc.edu/grad/online/degrees.shtml.

3.   Administrative issues

3.1   Administration

UMUC's academic enterprise is divided into two 'schools': the School of Undergraduate Studies and the Graduate School. This structure differs from that of many other American universities, in which several schools of the main academic disciplinary areas such as medicine or education, oversee the offering of both undergraduate and graduate degree programmes in those areas. At UMUC, the various academic disciplinary areas are housed in departments within the two schools. The Deans of the two schools have overall responsibility for the academic content and quality of all courses regardless of whether the courses are delivered online, 'face-to-face' in a physical classroom, or via some other medium. The Deans also have responsibility for the scheduling of classes and the staffing of courses with appropriate faculty.

As mentioned in Section 2.2 above, the Deans of both schools are responsible to the Provost and Chief Academic Officer of UMUC, as are the directors of the two overseas divisions. The directors of the units that conduct research and provide student services such as admission, registration, graduation, and library services are also under the Provost. The university's Senior Vice-President for Policy and Administration oversees the Information Technology Office as well as the business operations of the institution: finance, procurement, facilities management, marketing and communications, and external and governmental relations. Both the Provost and the Senior Vice-President report directly to the university's President.

This division of the university into two large 'enterprises', one academic and one administrative, has worked well for UMUC during the rapid expansion of its virtual university.

3.2   Costs and financing

As a 'state' (as opposed to 'private') institution, UMUC receives part of its annual operating capital from the government of the State of Maryland. In UMUC's case this is a very small amount: approximately 8 per cent of its total revenue. The overwhelming majority of its revenue – almost 75 per cent – comes from student tuition and fees. The remainder of the revenue comes from a mix of federal, state, and private grants.

The amount of tuition a UMUC student pays depends on two factors: the 'level' (undergraduate or graduate) of the courses the student is taking, and whether or not the student is a resident of the State of Maryland. As is typically the case in USA institutions, undergraduate tuition is lower than graduate tuition, and residents of the state pay a lower tuition rate at the state's universities than do non-residents. The tuition rate does not vary by delivery method; students who take online courses pay the same tuition rate as students of similar level/residency status who take 'face-to-face' courses.

Not surprisingly, technology is one of the two largest areas of expense for UMUC (the other is salaries and benefits for faculty and staff). Setting up and operating a large virtual university is extremely expensive. The initial investments in technology and personnel are prodigious, as are the ongoing expenses in the areas of course development, faculty

recruitment and training, and the creation of online student services as described above. These factors require that the virtual university initiative be run in a very entrepreneurial fashion. It must be both accountable and efficient; it must also be prepared to systematically evaluate and, when necessary, swiftly re-engineer its management, organizational, and academic practices. This type of flexible, entrepreneurial operation seems to be uncommon in US colleges and universities; many of the recent failures of virtual university initiatives in the USA may have been caused at least in part by inappropriate management practices and underestimation of the complexity and costs of online distance education.

3.3   Technological infrastructure

UMUC's Office of Information Technology provides leadership, training, support, and innovation in computer and telecommunications technology to students, faculty, and staff. It is, therefore, an integral part of the virtual university initiative.

The virtual university 'platform' is maintained and administered at UMUC's main campus in Adelphi, Maryland. The global infrastructure consists of three primary 'clusters' of servers: one at Adelphi, and one each at the headquarters of UMUC's European and Asian divisions. The Adelphi server cluster is specifically designed to provide protection from failure for individual courses. Each online course is located on at least two servers; if one server should fail, the course would automatically be available to students and faculty on the other server. Further, each server has redundant, independent connections to the Internet. In fact, redundancy is essential throughout the virtual university to ensure constant access to the online classrooms and services.

The IT office also provides dedicated UNIX servers for various academic and support services, including worldwide authentication of students, faculty and staff into the web-accessible library database server. One important component of these technology support services is the operation of academic computing laboratories. UMUC maintains almost 100 computing laboratories around the world to support its academic programmes. These laboratories include teaching theatres with state-of-the-art projection equipment and high-end workstations, classrooms with instructor stations, and open laboratories with workstations for independent student work.

Technology expenditures are managed centrally by the information technology offices for the main campus at Adephi, UMUC-Europe, and UMUC-Asia, rather than dispersed throughout the individual departments or delivery units. This practice aligns information technology expenses with institutional goals and allows greater economies of scale, budget control, and accountability. To ensure that information technology planning occurs systematically, UMUC has developed a centralized needs assessment and budget planning process tied to the development of the fiscal year budget.

3.4   Intellectual property ownership and copyright

This extremely complex issue is of particular concern to UMUC given the breadth of its involvement in online education. Until recently the USM policy on intellectual property allowed UMUC to assign ownership of courses and related materials almost completely to the institution. Faculty and other subject-matter experts were hired on a contract basis to produce new course content and learning objects with the understanding that the resulting material was the property of UMUC. This policy, like those of many institutions in the USA, had as its

basis a body of law that was last amended in the 1970s (prior to the great growth in the use of information and telecommunications technologies that culminated in the Internet).

As the use and influence of the Internet and related technologies grew, however, it became obvious that the guidelines provided by existing USA copyright laws were inadequate. The USA Government has since attempted to address the inadequacies through additional legislation; the Digital Millennium Copyright Act, which was signed into law by President Bill Clinton in 1998, is one example. Nonetheless, the situation is still in a state of flux.

The implications of attempting to apply existing copyright laws to electronic media such as the Internet are quite serious for higher education institutions such as UMUC. The nature of the Internet seems to foster the perception that information on it is somehow 'in the public domain' and thus not protected by copyright law. Further, Internet technology makes it very easy for users to copy and use such material. This raises concerns about how online students are obtaining and using web-based material in their coursework.

There are also concerns related to faculty. UMUC encourages its faculty members to add their own intellectual and experiential enrichment to the agreed upon syllabus of a course. In 'face-to-face' courses the faculty member's spoken lectures and comments are rarely recorded and, therefore, not protected by copyright law; in an online class, however, every word written by the faculty member is permanently recorded. Does the institution 'own' such material because the faculty member is acting as an agent of the university, and can it therefore use the material in future courses? Or is it in fact the property of the faculty member, who must be compensated for any future use of it by the institution?

In light of the ambiguity of the situation, UMUC's leadership is re-evaluating its current copyright and intellectual property policy. At present, UMUC is working with the other institutions of the University System of Maryland to create a new System-wide policy on intellectual property. It is anticipated that each System institution will develop its own specific procedures for implementing the guidelines of the System policy. In addition, UMUC has created a Center for Intellectual Property and Copyright in the Digital Environment that is tasked with providing "resources and information for the higher education community in the areas of intellectual property, copyright, and the emerging digital environment." The Center, which is staffed by experts from UMUC's ILS and ODELL, offers workshops, online training sessions, and electronic and print publications related to the issues. It also hosts an intellectual property Scholar-in-Residence who conducts research into the issues and provides university administrators and faculty with the latest updates on copyright and intellectual property law and practices worldwide.

4.   Academic issues

4.1   Programme development

One of the first decisions UMUC had to make at the outset of its virtual university initiative was whether to take on the creation of online courses and programmes itself or to contract with an external organization for this service. It may seem somewhat strange that a university would consider 'outsourcing' such a critical part of its mission. Given the tremendous expense involved in creating online courses, however, it was and remains a viable option for institutions seeking to create a virtual university.

UMUC chose to develop its own online courses in part because it already had in place an effective course development unit, the staff of which was proficient in designing courses for delivery through non-traditional methods. Nonetheless, the university had to invest a considerable amount in additional resources and staff because of the technology involved in online delivery.

UMUC now uses a mix of two general approaches (and variations thereof) to online course development: these may be characterized as the 'single professor approach' and the 'team approach'. The single professor approach, which is widely used in the development of graduate-level courses, involves a subject-matter expert (usually a faculty member) who creates the basic syllabus of the course: the learning objectives, main themes, lists of required texts, and minimum academic content. When this syllabus is approved by the Dean the subject-matter expert works with a distance education co-ordinator to create an online 'virtual classroom'. The distance education co-ordinators are non-faculty specialists in web design and technology who are assigned to the individual academic departments. Using institutional guidelines for online pedagogy, these co-ordinators assist the subject matter expert in placing the academic content of the course into UMUC's online delivery format. The result is a course framework that individual instructors can then personalize and enrich with their own lectures, discussions, additional readings, and so on. This is a very flexible approach to course development; it has allowed the Graduate School quickly to convert its existing 'high demand' courses into a format suitable for online delivery.

The team approach to online course development was pioneered, and is still largely used, by UMUC's School of Undergraduate Studies. An Instructional Development department, under the supervision of the Dean of Undergraduate Studies, houses a number of teams of specialists in instructional design and web and multimedia technology. In the team model a group of subject matter experts – usually a curriculum specialist, a content expert (the actual 'author' of the course), and a qualified peer reviewer – creates the course's entire academic content. This material is then carefully converted into UMUC's chosen online format by instructional and technology experts. The team approach provides minimum standards of appearance across courses and an intensive review process that helps to further ensure that the academic content of the courses is of the highest quality.

4.2   Teaching

As mentioned above, UMUC created its own online course delivery 'platform'. At the time UMUC launched its virtual university initiative there were few commercially available

platforms, and those that were available were felt not to be of suitable quality and flexibility. UMUC's platform, known as WebTycho, began as a DOS product. A subsequent Windows version was developed, which in its turn was replaced by the current web-based version.

UMUC's leaders felt that an online delivery platform had to be intuitive, seamless, and 'friendly' to its student and faculty users so that their attention would remain on the course content and not on the technology. A balance had to be struck between too little technology, which could hinder a faculty member's ability to teach effectively online, and too much technology, which could be a barrier to those students and faculty whose technology fluency was not of the highest.

UMUC has also chosen to use an *asynchronous* mode of communication; students and faculty are not required to be in the virtual classroom at the same time. This feature gives an unprecedented flexibility to both students and faculty; it has the added effect of allowing persons from all over the world to enrol in the same 'section' of a course, thereby enriching the educational experience of each.

Faculty members in a WebTycho classroom have the tools with which to create and post short lectures, discuss topics and hold debates with and among the students, assign readings, and collect and evaluate assignments throughout the course. In addition to the course content and conference areas, a UMUC virtual classroom has certain other standard features including a 'webliography' (the term for an area in which faculty and students can list and access URLs for material related to the course's content), confidential assignment folders for each student, and a 'chat room' feature that allows the instructor to communicate synchronously with a student who needs immediate or confidential assistance.

UMUC provides its faculty with both the training and the support necessary to teach effectively online. Before teaching an online course a faculty member must successfully complete an intensive five-week training programme that covers the use of the technology itself as well as techniques for creating a high quality online learning experience for students. In addition, UMUC also provides its faculty with ongoing professional development activities in the form of workshops and symposia on online teaching and technology. Finally, UMUC encourages its faculty to conduct research into online teaching by means of small competitive grants.

4.3   Learning

A. Frank Mayadas, a nationally recognized expert in distance education from New York's Alfred P. Sloan Foundation, recently stated that two distinct models seem to have emerged in the area of online course delivery in higher education: the *broadcast* model and the *interactive* model. According to Mayadas, the broadcast model tends to rely on a high level of multimedia technology, mainly one-way communication of information (from the instructor to the students), large class sizes, and independent study by students. The interactive model, as its name implies, features two-way communication (from instructor to students and back again, as well as among students), less use of multimedia and more of print-based conferencing, and greater faculty involvement in the learning process.

At first glance the broadcast model would seem to be more attractive to institutions launching new virtual university initiatives. Although the initial investment in technology and course development would be quite high, the institution could reasonably expect to receive offsetting

tuition revenues from the very large classes that characterize this approach. Further, an institution using this model would tend to have lower ongoing expenses in the areas of faculty and other human resources. The interactive model, on the other hand, would require a smaller initial investment in technology but far more ongoing investment in such things as faculty and IT professional salaries, recruitment, and training.

UMUC chose to follow the interactive model in setting up its virtual university. The university's leadership felt that, despite the fact that it would ultimately be more expensive to implement and maintain, this model would provide a much more satisfying educational experience to students. UMUC's interactive delivery platform WebTycho provides a 'virtual classroom' in which the students and their instructor interact in ways similar to those of a traditional 'face-to-face' classroom (albeit asynchronously). The instructor delivers lectures, facilitates discussions about the topics presented, assigns and discusses readings, and collects and evaluates assignments and assessments throughout the course, just as he or she would in any university classroom.

To participate in a typical online class via WebTycho a student need only have an Internet Service Provider, an active e-mail account, and a computer with Netscape 4.5 or better web browser, or Internet Explorer 5. Certain courses, particularly those in technology-intensive academic areas, require additional software or computer capacity. Because of the text-intensive nature of the medium, online students must have strong reading and writing skills in the English language. They must also have sufficient self-discipline to log into their classes several times a week to avoid falling behind the work-completion schedule.

UMUC has found that its adult students have different expectations of what constitutes a university level learning experience. Among these expectations are:

- *That there will be a balance between theory and practice.* Since many adult learners are seeking to enhance their effectiveness in current jobs or competitiveness for future jobs, they demand that the introduction of theoretical concepts in a discipline be followed by practical examples of those concepts at work. For this reason UMUC conducts multi-level reviews of new and existing course syllabi; makes use of external subject matter experts where appropriate; and conducts surveys of the employers of UMUC students to determine if the curriculum is being kept close to the needs of the working student and his/her workplace.
- *That faculty will have both professional and academic qualifications.* An adult student taking a course in business administration, for example, is unlikely to be impressed by a faculty member who has never had responsibility for the day-to-day operations of some aspect of a private- or public-sector organization. UMUC uses two principal criteria in its faculty recruitment efforts: academic qualifications and relevant professional experience. UMUC views its faculty as 'scholarly practitioners' who can bring to a course their own insights and observations based on practice.
- *That they will be engaged in the learning process.* UMUC has found that adult learners have little tolerance for instructors whose communication in class consists solely of one-way lecturing. They expect interaction, both with the instructor and with their fellow students. Their view is that the instructor does not impose learning on the students, but rather that the instructor and the students work together to create learning. Further, adult learners have a more extensive base of experience than do younger students; adult learners expect faculty to draw on this experience in order to enrich the learning process. This expectation has led UMUC to design much of its course content around such techniques as group projects and the use of case studies.

- *That they will receive regular and timely feedback.* UMUC has long believed that adult learners are most successful when they receive regular, timely feedback on their performance. UMUC emphasizes the need for this feedback in its faculty training and development programmes, as well as in its evaluation process.
- *That there will be coherence among the courses that constitute a degree programme.* Adult students, who typically must make significant personal sacrifices in order to attend classes at all, do not want a degree programme consisting largely of haphazardly chosen, often unrelated courses. They expect the required courses to be linked together in a logical, progressive manner and the elective courses to be chosen for their complementarity to the main academic focus of the programme. This is especially important in that adult learners may have been out of school for some time or may have gaps in their education caused by taking scattered courses while working. They have a special need for curricula and course sequences that put their experience in context, refresh their knowledge of the field and update their skills from previous courses, and tie their real-life experience into a body of knowledge. UMUC seeks to provide this unity by careful selection of general education requirements and by encouraging students to seek counselling regarding the selection of elective courses.
- *That the university will help them to be accountable for learning outcomes.* Adult students have a somewhat more pragmatic view of the value of their courses and degree programmes than do younger, more traditional students. They expect the university to assist them in demonstrating that the learning objectives, both of individual courses and of full degree programmes, are being met. UMUC's emphasis on assessing outcomes through a variety of techniques stems from this characteristic of adult learners.

These expectations inform UMUC's decision-making during the development of new courses and programmes or new methods of delivery.

5.   Cooperation

UMUC frequently enters into cooperative relationships with USA government agencies and private companies for the purpose of providing courses and programmes to employees of such organizations. Recent examples of such relationships include an agreement with the US Army's Management Staff College to offer a master's degree in 'Army base management' to selected Army officers, and a partnership with the Hitachi Corporation's Institute of Management Development to offer UMUC online courses to qualified Hitachi employees worldwide. For students in the Army's Management Staff College, UMUC has agreed to award credit for coursework completed as part of the Staff College's curriculum; the students may then go on to earn the UMUC master's degree by completing any remaining required courses. In the UMUC-Hitachi partnership, Hitachi will use selected UMUC online courses as part of its employee development and benefits programme.

In order to strengthen its global presence and increase the diversity and richness of its educational and research efforts, UMUC has also entered into cooperative relationships with a number of international universities. One of the most successful of these relationships has been that with the Carl von Ossietsky University of Oldenburg, Germany. Oldenburg, a leading German institution with extensive experience in distance education, contributes a certificate and several courses to UMUC's popular online Master of Distance Education (MDE) degree programme. The Oldenburg courses carry full UMUC credit and help to ensure that the MDE programme has the broad global perspective critical for distance educators in today's world. UMUC currently has relationships with ten other international universities including Far Eastern National University in Vladivostok, Russia; Universidad Nacional de Educación a Distancia in Madrid, Spain; and the Hong Kong Polytechnic University in Hong Kong.

One significant challenge faced by UMUC in these kinds of relationships is the evaluation and awarding of transfer credit for courses taken through a non-university programme or at non-US institutions. This sometimes requires an in-depth review of the partner organization's curriculum and course content by UMUC faculty, followed by recommendations for equivalency to specific UMUC courses. A second challenge – that of ensuring English-language proficiency – has arisen both from these global partnerships and from the increasing number of international students applying for admission to UMUC courses and programmes. Like many US institutions, UMUC makes use of the Test Of English as a Foreign Language as a screening mechanism for such applicants; it also provides both for-credit and (at the graduate level) non-credit English and writing courses online.

6.   Future development and institutional change

UMUC's leaders have identified two key areas of concern for the future of the institution: changes in technology and the continued growth of UMUC in response to the tremendous demand for online courses and programmes.

The information and telecommunications technologies used in the delivery of online courses are among the most rapidly changing of all; staying up to date with these changes will be a major challenge for the university. UMUC will have to decide how best to balance the benefits of the addition of new technology to its online platform with the desire to provide maximum access to potential students, not all of whom will possess, or be comfortable using, the latest technology. It will also have to complete a major implementation effort for a new institution-wide integrated information system. This system, which will replace UMUC's current 'legacy' system, will provide UMUC faculty and staff worldwide with instant access to information necessary for the efficient delivery of worldwide student services. It will also offer students even more convenience when conducting routine activities such as registration, graduation clearance, request for transcripts, and application for financial aid.

All indications are that the rapid growth in enrolments, particularly online enrolments, experienced by UMUC over the past eight years will continue and even accelerate in the future. Recently the Maryland Higher Education Commission predicted that by the year 2010 UMUC's enrolments will nearly triple, making it the largest university in the State of Maryland and one of the largest in the USA. The overwhelming majority of these new enrolments will be in online courses; this means that the students taking these courses will likely live outside of Maryland and possibly outside of the USA. As mentioned in Section 2.1 above, providing services to students located at a distance presents formidable challenges; as the number of such students rapidly increases, the challenges will increase as well. UMUC's leaders will have to decide the maximum size to which the university can grow and still provide high-quality programmes and services to its students.

7. Policy development, planning, and management in the virtual university: the most important lessons learned and recommendations

Over the past eight years the faculty, staff, and leaders of UMUC have indeed learned a number of important lessons in the realms of policy, planning, and management for the virtual university enterprise. Some of the lessons learned may not be applicable to all institutions; nonetheless, they typically reflect decisions that will have to be made by an institution's leadership at some point during the process of launching a virtual university initiative.

7.1 Policy development

- As seen in this case study, institutions that are heavily involved in online learning face the possibility of conflict with existing national and other external policy makers. The US Government's policies on higher education do not yet fully recognize the value and quality of online education; this has implications for the financial aid eligibility of online students. The regional accrediting bodies tasked with ensuring quality in US higher education face their own challenges in understanding the unique demands that online education places on colleges and universities (although this situation is, fortunately, improving. Indeed, UMUC's accrediting body, the Middle States Association Commission on Higher Education, has been very active in the creation of standards for distance learning). Finally, US copyright and intellectual property law, on which university policy is founded, lags behind the profound changes that advancing information technology has made.
- Institutions seeking to launch virtual universities would do well to study in detail the prevailing higher education laws and practices in their respective countries to determine if they conflict, or could potentially conflict, with the realities and demands of online education. Such institutions must also be prepared to make significant and often rapid changes to their own internal policies. This can be difficult in the face of resistance by those who do not support the idea of distance learning in general and online learning in particular.

7.2 Planning

- UMUC's virtual university effort grew so rapidly during the period 1994 to the present that it may at first glance seem that the institution's time and effort have been spent simply in trying to keep up with the demand for online courses and programmes and the necessary student services to support them. As shown in this case study, however, the university's leadership in fact had to make several key planning decisions both at the outset of the virtual university endeavour and during the subsequent years of high demand and growth. Those decisions continue to affect planning in both the academic and administrative enterprises.
- The first and probably most important decision for UMUC was the choice of a model for online courses. Its choice of what Mayadas calls the 'interactive' model influenced a number of later decisions, including whether or not to outsource course development and whether to buy or develop an online delivery system. The choice of the interactive model

also influenced the current organizational structure of the university's academic enterprise.

- The choice to develop a proprietary course delivery system, rather than to purchase a commercial product, was one of the most significant financial decisions for the university. Not only was the start-up cost of the system quite high, but the ongoing costs associated with operating, maintaining, and constantly improving it continue to rise. Nonetheless, UMUC's periodic evaluations of its WebTycho platform against the commercially available systems continue to demonstrate that, for UMUC's purposes, WebTycho is fully as good as, and in some key features better than, the commercial products. Whether an institution creates its own online course delivery platform or purchases a 'ready made' one, it can expect to invest continually in the expansion and enhancement of the platform's technological capabilities.

- The decision to develop online courses internally rather than to seek an outside developer also continues to have an impact on UMUC's planning. As demand for online courses and programmes continues to rise, the institution must ensure that it can keep pace not only in terms of sufficient courses and programmes but also in terms of faculty, student support services, and technology. While it is certainly true that not every institution will grapple with such huge enrolment increases in its online offerings, it would nonetheless behove any institution seeking to enter the online education field to be prepared to 'scale up' its operations in response to a significant rise in demand.

7.3   Management

- UMUC's leaders attribute much of the institution's success, both throughout its history in general and with its virtual university initiative in particular, to the fact that it is highly entrepreneurial in nature. Managers in both the academic and administrative enterprises at UMUC are held accountable yearly for the meeting of strategic performance goals and objectives. Department- and institution-level budgets are closely aligned to these goals as well. Proposals for new courses and programmes, research projects, and other similar initiatives are evaluated closely to ensure that the initiatives will benefit students and further the institution's mission without putting an unacceptable strain on existing resources.

- UMUC places great emphasis on the service aspects of its operation. It recently centralized a number of key student services into an entity called the 'Student Success Center'. As mentioned above, the university has a unit – the Center for Teaching and Learning – dedicated solely to faculty training and development. UMUC has a National Leadership Institute that offers non-credit training to senior leaders in both public and private sector organizations. Finally, UMUC's research agenda is geared largely towards the improvement of both teaching and learning among adult students and in the online, distance education environment.

- This analysis of UMUC's virtual university enterprise has shown that the keys to the institution's success in online education seem to be flexibility, scalability, and quality. Flexibility includes within it the ability to create and adopt new ways of delivering higher education to students who have special needs in terms of time and place. Scalability calls for an institution to choose its systems, both human and technological, wisely so that increased demand can be accommodated without loss of quality in courses/programmes and services. Quality is a sine qua non for US higher education in general and online higher education in particular, thanks in part to the intense scrutiny of online courses and degree programmes, and to the increasing demand for demonstrated accountability (in the form of outcomes assessment), by the US Government and by education oversight bodies.

Online education is an exciting new solution for the changing educational needs of the twenty-first century; here at the outset of that century UMUC has taken a significant lead in the effort to make it as accessible, and of as high a quality, as possible.

References

Allen, N. H. 2001. Lessons Learned on the Road to the Virtual University. *Continuing Higher Education Review*, Vol. 65, pp. 60-73.

Mayadas, L. F. 2001. Testimony to the Kerrey Commission on web-based education. *Journal of Asynchronous Learning Networks*, Vol. 5, No. 1, pp. 134-138.

Parker, M. L. 2002. Annual report on shared governance. Unpublished, UMUC.

UMUC. 2001. Policy on faculty appointment, rank, and promotion. Retrieved August 1, 2002, from http://www.umuc.edu/policy/fac18100.shtml.

UMUC. 2001. Periodic review report to the Middle States Commission on Higher Education. Unpublished.