# Strategic Plan for Instructional Technology for of The University of Montana, 2008

# A report of the

# Academic Instructional Technology Committee

### Executive Summary

The Academic Instructional Technology Committee was reconstituted in January, 2008 as an advisory committee to the Provost for Academic Affairs and to the CIO. The initial charge was to devise a statement of strategic issues facing Academic Affairs at UM. This report pro vides a brief background of a similar 2003 report as a benchmark for progress in Academic IT.

Themes in 2003 and today include the need for additional funding to implement plans and for greater integration of technologies. The 2008 reports illustrate a change in the need of faculty development to move away from a “tools orientation” to a learning outcome based view to address the development of effective use of such tools in instruction.

 Central in this report is the current Web 2.0 environment of technology where our students live and breathe. Web 2.0 includes a variety of communication tools such as blogs, wikis, collaborative web to create a very social and participatory network where user created and published content is the norm. This expectation for a more ubiquitous, mobile and open technological environment creates challenges for security, privacy and access management of the university network and assets. The Mansfield Library has included several of these technologies in the delivery of its services and method of communication with our users but the perception is that we are behind the curve—we are following students rather than setting the pace.

The overarching strategy for instructional technology is one of optimization of existing resources. Given the ongoing constraint of little or no new funding, goals must draw upon existing resources and have specific outcomes as well as create an environment where students will gain experiences that best prepares them for the use of technology in their careers.

Optimization of resources will require a hard look at the question of *centralization and distributed services*, funding and support. Centralization vs decentralized IT is a constant topic in conferences and debated in the literature because it is situational to the institution culture and political climate. Trade offs are in cost, autonomy and service delivery. An optimizing strategy does not position us as a leader but rather in fulfilling our educational objectives and being competitive with peers.

**Immediate concerns to address in an optimization strategy:**

1. Optimizing funding requires broader examination than within Academic Affairs because of the crossover of support that the fees provide for Central IT.

 For the Student Computer Fee this is seen as a method of charge backs to the Colleges using the mechanism of port subsidies , originally created several years ago to connect levels of support from IT to the colleges that use IT the mos. Higher use was interpreted as enrollment size and degrees which is no longer in sync with technology use or needs. Instructional fees are also allocated to Colleges with an indirect support for the general use classrooms.

* 1. A discussion of the future of general computer labs and our current capacity needs for general labs and labs with specialized software or technologies . For example, the need for improved language labs, GIS labs and the lab/classrooms used intensively by New Media Arts are not served with the general labs or the funding we allocate.
	2. Within the lab discussion, considering the shift in funding for software instead of hardware for student computing needs as the majority have access to personal computers. Included in this discussion is the centralization of the licensing and distribution of software to campus. The software that is now licensed can not be easily identified or found by students.
	3. Greater investment in hardware to increase wireless speed and coverage at the infrastructure level will continue to meet the increasing needs of mobile computing. The need to continually build out the wireless network across and to address the Internet2 network access for research is being addressed but not yet completed.
	4. Classroom technologies are not funded for growth or sustainability. We rank last in our peer group for classroom technology utilization based upon our registrar controlled classrooms. This potentially impacts recruitment of students but certainly negatively impacts teaching where the utilization of technology is denied.
1. The call for greater integration of technologies needs to be better understood and defined. For students this could mean the ability to find instructional or course related material in a central source that is predictable across all curriculum. Similarly for faculty this could mean learning and using a single process and building applications within that environment, with predictable and supported (as in technical expertise, training and sustained) organizations.

A strategy to optimize our resources and existing organization for e-learning could be to standardize on a courseware management system (currently referred to as Learning Management Systems in industry) for all course pages to blend features of courses delivered at a distance and campus classes and push content, training, and development to the course page and drive the integration of technologies and services to a single environment.

Currently, the student experience in using technology will differ from college to college and course to course. Blackboard is used to differing degrees in face to face classes, the wireless access differs between buildings, where a student will find syllabi for a course, the reserve reading can be found in any of the following -on faculty member websites, Blackboard , in the library or in the case of COT on the college intranet. If we were to optimize the use of Blackboard or similar courseware, podcasts, reserves, assignments, video clip can then be pushed to the single environment and would be expected to be found by the student with some certainty.

Initial steps are to undertake an evaluation of Blackboard fall, 2008 against other open sources systems with the expectation that we will be investing more heavily into Blackboard or migrating to another system by Feb 2010 when our Blackboard contract ends. The cost of licensing Blackboard and the limitations imposed by using proprietary software in an age of open technologies are powerful arguments for this evaluation.

1. The call for faculty development toward *effective* use of technological tools in instruction is a shift away from the unstructured technical support of “tools” instruction to one of use of technology to best advantage for learning. This will need to be a collaboration of several units (IT, UMOnline, and the Library) but needs to have a center in order for faculty communication and delivery. A key element here is the optimization of our existing expertise through what is called “alpha teams” in the Courseware Management Systems Report. This essentially is structured, shared, vetted experimentation and development of technologies and uses. This would be our equivalent of research and development for instructional technologies and provide the test bed and learning environment for advancement in any area of technology not just the Courseware Management Systems.
2. The establishment of an Internet 2 link for research and general education.

Richard Hauer’s memo included in this report outlines the progress over the summer to work with the NSF-EPSCor office in Kentucky in a grant proposal to acquire high speed access for researchers at UM, particularly the Biological Stations. This has been coordinated through the UM Research Office. It does not appear that this grant would be extended to UM generally.

## Introduction

**Background-2003 Cluster report on academic computing**

In 2003, Academic Affairs engaged in a series of cluster groups to write position papers on a variety of issues facing Academic Affairs. For IT, it was the Education in a Technologically Advanced World (ETAW) Cluster.

 The vision statement from that group was:

*“The ETAW cluster imagines breaking down the barrier of time, space and resources to revolutionize teaching and learning by providing a network culture whose potential is limited only by imagination. This is envisioned as a tool to recreate the educational systems and to expand it beyond inherent limitations through critical thinking and the generation of creative ideas.”*

In the strengths/weaknesses statement, the ETAW cluster noted weaknesses were lack of an integrated approach to technology and lack of cohesive forward movement. The report listed hurdles to overcome that included pockets of technology or “fiefdoms”, limited financial means to implement plans and pervasive attitudinal and political circumstance. Strengths were enthusiasm and unlimited potential. The academic priority was to create a campus-wide network culture.

**Academic Information Technology Committee (AITC) reformed 2008**

In 2007, Academic Affairs revisited this report and outlined a series of assessment for gap analysis, infrastructure reports and current technical support studies. In January, 2008, an new Academic IT Committee (AITC) was appointed and charged with developing strategic initiatives for IT in Academic Affairs, to act in an advisory capacity and to guide implementation of plans into the future. Later that spring a strategic planning committee for Academic Affairs was appointed and began work. The AITC strategic issues statements are to be read and considered in the context of the Academic Affairs Strategic Planning effort.

## Environmental Scan (industry view)

The Horizons 2008 report from New Media Consortium and a variety of Educause publications were used to develop a snapshot of the issues in academic information technology.

New Media Consortium reports emerging technologies in the context of social networking, specifically

* the growth of grass roots videos driven by the ready availability of cheap, easy and ubiquitous software and equipment (such as cell phones),
* the growth of collaboration webs through open course web tools that allows for collaborative documents, online meetings and sharing of information; (e.g. google docs, wikis
* increasing mobile broadband making content more readily delivered and created;
* data mashups which are customizable applications that allow combinations of data from different sources to be to be merged or “mashed” (e.g. mapping tools applied to specific uses)
* collective intelligence which emerges from large groups of people working on the same issue (Wikipedia)
* Social operating systems is the next generation social networking . Social operating systems base network organization around people rather than content.

Educause 2008 list of top ten IT issues are:

1. Security
2. Administrative/ERP Information systems
3. Funding IT
4. Infrastructure
5. Identity/access management
6. Disaster recovery/business continuity
7. Governance, organization and leadership
8. Change management
9. E-learning/distributed teaching and learning
10. Staffing /HR management/training

It is interesting to note that the 2007 list from Educause included course management systems, which has now been dropped. A possible explanation is that Learning Management Systems such as Blackboard with faculty training, support and development are included in the larger environment of E-Learning.

In looking at both lists, the influences of the open communication and content sharing noted in the NMC list increase the need for security and access management by IT in managing/protecting the assets of the institution while allowing sharing of content. It is challenging to IT departments everywhere to provide high levels of security and while providing an open, ubiquitous wireless network that is increasingly expected by our students. The Infrastructure section of this report details the response other schools have had to this dilemma.

## Campus scan

From the AITC reports on broad topics (Learning Management Systems, classroom technology and Banner) a common theme is the lack of integration of technologies . Associated with this theme is the unstructured or lack training/consultation for faculty to effectively use technologies in the classroom. The financial infrastructure that supports academic uses of technology is equally disconnected with current applications. Funding is primarily fee-based and distributed based upon formulas that were designed for equity rather than outcome—but in any case is insufficient for impactful change.

The pieces, however scattered and underutilized, are in place.

 The key players in an E-Learning environment are the Library, IT and UMOnline. Mansfield Library has made significant strides in moving to electronic databases and journal collections. Services from reference, reserves, research guides have moved to electronic media including text messaging, wikis , blogs and electronic reserves. The intent is to become more available and more interactive. The library is increasingly creating content for the digital environment through digitization and working to address the issues of preservation of born digital materials as well as using digitization as a means of preservation. The availability of technology to students has increased in the library from laptop checkout, presentation practice equipment, as well as production equipment for multimedia . The next phase in the Library’s learning commons initiative is to design the physical space, the integration of technology, software and expertise with the intention of a collaborative learning environment.

Students arrive on campus fearless in the use of technology but not necessary knowledgeable in the use of technology for learning.

A courseware management system, more currently called Learning Management Systems in industry, is in place but is primarily focused in delivery of distant education courses and does not yet have a majority of use across the curriculum. Knowledgeable professional staff are in place and strong growth in distant education revenue and use is being realized.

Faculty development is “tools oriented” rather than outcomes focused and are available in an unstructured mode from Technology Support Services in Central IT.

## Strategic Plan

**Strategy 1: Learning Management Systems (Courseware Management Systems)**

The university has the technical resources and the expertise to further develop the existing course management system-Blackboard—into a dynamic interactive learning environment. Further development to better integrate Blackboard with other systems would need to be implemented with the expectation that this development would be difficulty given the proprietary nature of Blackboard and the sustainability of the increasing costs of maintaining the license.

**Actions:**

1. Beginning fall, 2008, launch a comprehensive evaluation of Blackboard in comparison to other options and our overarching strategic goalsDevelop a campus-wide systems architecture plan that articulates the relationships and integration of enterprise systems from Banner to Blackboard to OneStop.
2. Investigate outsourcing technical support
3. Consider blended learning strategies at the outset of program design
4. Develop an “alpha-teams” mechanism for experiments with and vetting new technologies and techniques.
5. Develop and support a strategy of planned and coordinated faculty training and support mechanisms with respect to effective use of technologies for teaching, learning and collaboration.

 **Strategy 2: Improve the interface between enterprise wide programs and Banner to reduce double entry of financial data and improve the generation and distribution of reports on student data.**

**Actions**

1. Develop improved interface capabilities between Banner and other enterprise applications on campus such as Blackboard to provide the university with timely reports for university planning and analysis. Develop other applications that are dynamically accomplished such as data transfer between Banner and One Stop.
2. Development of a Student Data Warehouse, similar to the current Financial Data Warehouse, that would permit the timely generation of enrollment and statistical reports to be used for accreditation, assessment, budget analysis, etc.

**Strategy 3: Equip all classrooms with instructional equipment and wireless connectivity within five years.**

According to the Core Data Survey in 2006, UM ranked last in 13 of our peer group for technologically equipped classrooms. Only 25% (23 of 96) of our registrar controlled classrooms are equipped with technology. An inventory of the number of our total classrooms and the level of technology overall is underway by the registrars office. This inventory will include both “registrar controlled” and “College controlled “ classrooms. Generally the College controlled classrooms are in newly constructed buildings. It is unknown at this time how we would have ranked if the 2006 had included all classrooms.

 As indicated in earlier reports from IT there isn’t a projected funding model for the College controlled classrooms or Registrar controlled classrooms to maintain or advance the technology—all is on a one-time-only basis. To equip an additional fifteen classrooms per year with the goal of equipping all registrar controlled classrooms in five years with the additional maintenance costs will require a growth in expense from the current $35,000 to $200,000 for year one to a maximum of $300,000 by year five without considering replacement schedules.

**Actions:**

1. Increasing the number of electronic classrooms with a standard array of features.

Coupled with an upgrade of classroom technologies, several new software packages (e.g Echo360) can assist faculty in recording audio, video, and PowerPoint presentations and digitally “publish” them directly to Blackboard or iTunesU. Several new “enhanced” electronic classrooms should be created which offer these new lecture-capturing technologies.

1. Creating the financial infrastructure that sustains and upgrades all classroom technology routinely.
2. Provide faculty development (training in the use and development of applications in information technology to enrich their teaching) that addresses the effective use of the technology placed in the classroom as well as build a more informed base of users for updating the standard technology set up in classrooms.
3. Complete the implementation of scheduling software for classrooms has yet to be implemented although we have owned it for five years.

*Strategy question: How would standardizing and training around Learning Management Systems drive the use and selection of technology in the classroom? Laptop, projector, internet would project the video and other slide presentations place in course pages—3D demo would be less effected; podcast, video casts???*

**Strategy 4: Establish a new base line capacity for general computer labs and the need for specialized student access computer labs.**

What is our capacity need and how has the purpose of the computer lab evolved with the increased availability of personal computers and the use of labs in instruction? Labs are funded by the Student Computer Fee with 60% allocated for equipment 40% for salaries for student technical assistants. IT receives funds for infrastructure using a charge back mechanism called port subsidy. The colleges receive allocations based upon a formula from the late 1990s that included the number of students, and degree offering in the college. As proven by the high-tech nature of the new Journalism building the size of the college is not the best indicator for the use of technology. In many cases, the labs that exist within departments serve the dual role of open general labs and instructional support labs.

A spread sheet that indicates the amounts of funding to support labs with and without the IT subsidy is attached.

**Actions:**

* + 1. **Examine the nature of the need for general computer labs and the campus capacity requirements in light of two trends: the increased use of laptops by students and the increased reliance on wireless connectivity.**
		2. **Identify alternative funding distribution models to meet the specialized technology and software needs, conserve space and support instruction.**
		3. **Examine the nature and need for specialized computer labs in light of the increased technologically capable classrooms across the campus**

**Strategic Concerns for Further Investigation**

**I.T. Infrastructure**

A broad range of technologies, software, and hardware comprises the total fabric of a higher institution’s I.T. infrastructure. This report does not attempt to comprehensively cover all of UM’s I.T. infrastructure but rather to spotlight important trends and technologies that should be leveraged to deliver a more engaging and robust platform to facilitate UM’s academic goals.

 The key issues facing The University of Montana academic community and its IT infrastructure are:

* **Wireless Access**: 802.11n and Tiered Access Control
* **Computer Labs**: Virtual Labs and Concurrent Software Licensing
* **Energy Conservation: Server and Storage virtualization**

**Recommendations:**

1. By 2009, the ITO at UM should begin implementing the 802.11n wireless protocol campus-wide. By 2011, this process should be completed.
2. By 2009, the ITO at UM should begin implementing a tiered policy architecture for wireless connectivity employing two-factor authentication. By 2011, this process should be completed.
3. UM should stop building and deploying traditional computer labs immediately.
4. UM should begin aggressively deploying 802.11n wireless using tiered access.
5. UM should begin deploying virtual computer labs in order to provide students with 24x7 access (on and off-campus) and in order to leverage software licensing dollars through a concurrent sessions licensing model.
6. UM should build **two** new energy-efficient **data centers** – one on the Main Campus and one on the South Campus – to accommodate both administrative (central) and academic (college/departmental) servers. These two data centers should be designed to act as disaster-recovery sites for each other. Space in server racks in both data centers should be made available for administrative (central) servers and academic (college/department) servers. By 2013, 80% of all servers on campus should be in one of these data centers and, hopefully, virtualized.
7. Central and distributed I.T. at UM should begin a massive **server** and **storage** virtualization effort. They should be encouraged to share “best practices” and to identify servers that can be virtualized.
8. Central and distributed I.T. at UM should begin working with vendors that participate in [The Green Grid](http://www.thegreengrid.org/home), a global consortium dedicated to advancing energy efficiency in data centers and business computing ecosystems.
9. Academic units should collaborate on server virtualization by deploying a shared storage area network (SAN) dedicated to academic software and data storage.

**Financial Infrastructure for IT**

**Establish a financial infrastructure to support expansion and support of instructional classrooms and labs that addresses overall need .**:

 Fee based funding: Instructional technology; Student Computer Fee (equipment and employment components). Funds distributed across colleges on a formula of size (students/degrees) rather than technology needs. The current fee based model generates too little for growth, new development. At best is supplemental.

**Actions:**

1. **Examine the potential for increased**  fees to generate new revenue
2. **Examine new fund distribution to meet the instructional goals of the campus**