

University of Missouri - St. Louis

Administrative Review
of
Information Technology Services
2006

Self-Study

“We help *you* be successful with technology”



May 18, 2006



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1 Vision

The vision of Information Technology Services (ITS) is aligned with the University's – we provide technology infrastructure, support and services that enable and promote the University's education, research and service missions as articulated in the Action Plans.

2 Mission

We help *you* be successful with technology.

2.1 Goals

Our mission statement distills the best of what we do for the University community. Incorporating our constituents' success as a desired outcome, the statement is also meant to be taken in two ways – in the sense of “successful in your use of technology” as well as in the sense of “successful through our (and your) use of technology.”

ITS's broad goals flow from the University's desired outcomes:

- enhancing recruitment, retention and success of students,
- proactive support of research and
- facilitating efficient administrative processes

so that more energy may be devoted towards the first two outcomes. We measure achievement of those outcomes through specific objectives and metrics that range from qualitative statements of student satisfaction to numerical measures such as “elapsed time to resolve helpdesk inquiries.”

2.1.1 ***Support for student learning***

ITS support for student learning takes three general forms:

Infrastructure, including:

- computing labs throughout campus, which students use for work on course assignments, general computing needs (e.g. statistical analysis, scientific analysis, etc.), email, access to learning and research materials
- technology enhanced classrooms, which enable instructors to teach using the latest instructional technologies

- web-based course and learning management tools, including MyGateway (Blackboard), Centra, Horizon/Wimba, etc.
- the online testing center, a proctored environment where students can take examinations online and at their convenience.
- the data network, which provides access to learning and research materials as well as the general Internet and the world research community through Internet2. The network extends to student housing facilities.
- the voice (telephone) network, which provides the usual array of telephone services (local and long-distance calling, voicemail, conference calling, etc.) to staff and students.
- the computing machinery that provides core services such as email, file storage, and web services for the entire campus 24 hours a day, 7 days a week.
- the high-performance computing cluster that supports research in disciplines including computer science, economics, biology, chemistry and physics.
- access to software, including email, personal productivity tools (MS Office, etc.), statistical analysis (SAS, SPSS, etc.), specialized programs such as geographic information systems, etc., virus and spam protection tools, etc.
- on-going enhancement and integration of technologies to facilitate teaching and learning. Examples include development of MyGateway into a “portal” for students and faculty, providing more seamless access to a variety of on-line tools.
- on-going investigation of promising technologies that can support learning. Current examples include classroom response systems (“clickers”), e-portfolio and content management systems.
- support for faculty and staff computing needs including the Desktop Systems Plan, which frees them to concentrate on their support for student learning and other University goals.
- close partnership with Student Affairs on the implementation of Peoplesoft Student Administration, a software system that has the potential to streamline processing of student admissions, recruitment, financial aid and records.
- development of other computer applications that streamline administrative processes. Examples that impact students include photo rosters so instructors can view images of the students in their classes, registration system for Continuing Education, online course evaluation instruments for students to assess their classes.

Person-to-person, including:

- the Technology Support Center or “helpdesk,” which supports email, phone and in-person inquiries about the use of technology and directly helps students in their learning.
- student lab support – personnel who also directly help students in their learning.
- the Faculty Resource Center, which supports faculty and staff in their use of technology in a drop-in center as well as through outreach programs directly to colleges and departments.

- short courses and workshops that cover a spectrum of technology topics, including introduction to MS Word, use of MyGateway, etc.

Special Events, including:

- Technology and career briefings: initiated in the Fall of 2005 in partnership with Cisco Systems, this series exposes students and other members of the UMSL community to “hot” technologies as well as career possibilities in technology fields. These help to relate real-world requirements to students’ academic learning as well as spark student interest in particular academic disciplines. Although primarily targeted at students, these briefings have attracted a wide audience of faculty, staff and members of the community.
- Conferences, including the Fall Teaching and Technology Conference: Co-sponsored with the Center for Teaching and Learning and with financial support from industry partners, these conferences allow UMSL faculty to showcase their support of learning through the innovative use of technology. We have found that the most effective way to engage faculty in the use of technology is for their peers to demonstrate their success and to share their stories.
- Workshops, including Teaching with Technology, Conversations about Teaching and Technology, Provost’s Forum on Learning and Technology and Technology Fridays. These are co-sponsored with the Center for Teaching and Learning.
- Special seminars: we organize and sponsor seminars on technologies in research, teaching and learning that are of special interest to the UMSL community. Examples include several seminars by Apple on the use of podcasting as a new way to disseminate teaching and learning materials and the annual “High Performance Computing Day.”

2.1.2 Relevance to Campus goals

Technology pervades life in the 21st century and enables modes of teaching and learning that were impossible even scant years ago. Therefore, while ITS goals have evolved along with the University’s goals, we have also had to respond to the overall environment. IT support organizations in most universities have developed along similar paths, although particular organizational structures may differ.

At the most basic level, our priority is to ensure that the technical infrastructure works. The myriad electronic and mechanical components: wires, optical fiber, switches, connections, servers, operating software, management systems, desktop computers, application software and other pieces that comprise a modern information infrastructure must work – reliably and cost-effectively, or none of the other ITS goals is possible.

In many other universities, the role of the IT organization stops at a basic level. Direct support for teaching and learning, even with technology, is often provided by

a separate organization. At UMSL, the role of ITS includes support of technology for learning. We are therefore able to build on the foundation afforded by a solid infrastructure to support higher order goals such as faculty and student success. Out of that work, we learn what to do to develop the infrastructure further – a virtuous cycle.

UMSL has the advantage of being large enough to attain reasonable economies of scale in the deployment of technology and yet is small enough that most IT functions can be centralized. This has helped to create a balance between effectiveness and cost efficiency that is relatively rare. For instance, because ITS supports student labs in locations across campus, a student from any program can walk into any of these open labs and do their work. At some larger institutions, labs are operated by Colleges or even departments and use is restricted by program. The challenges of creating cohesive student culture in a commuter campus are well-known. Open, general-use labs minimize confusion among students and may even help to break down walls between programs, equalizing access and fostering a culture of openness and inclusion. Although specialized departmental labs can be targeted to specific student groups, that structure tends to be more costly to operate and generates confusion among students as to the particular resources people are allowed to use.

2.1.3 Fostering campus mission

The Chancellor and campus community have extended the University’s mission into an Action Plan to which ITS contributes directly and indirectly. The following are excerpts from the Plan with accompanying highlights of our contributions.

Priority: Enhance the quality and delivery of undergraduate and graduate/professional education.

Goal 2: Strengthen academic programs.

- Further develop appropriate staff and academic support structure.

ITS directly supports this goal through continuing improvements to the information infrastructure as well as through direct support for faculty and staff in their use of information technology.

- Provide incentives for the development of alternative course delivery (online, ITV, video, accelerated, off-term, and weekend classes), and increase online degree programs from three to six.

ITS indirectly supports this goal through support of MyGateway online course management system, ITV classrooms, video production and extended hours of operation for classrooms and labs. In Fall 2005, ITS inaugurated competitive “Innovation Grants” as a more direct mechanism to encourage faculty to use new technologies and innovative methods to

enhance their students' learning. These grants are partly in response to the need for added incentives; the very competitive proposals received were an indication of the importance of incentives. We could easily have justified funding twice as many proposals as we did.

Goal 4: Develop IT infrastructure to support the academic mission with the following increases:

- Classrooms with computerized instructor stations from 60 to 120.
- Wireless access point coverage areas from 5 to 80.
- High-performance computing cluster nodes from 64 to 256.

ITS directly works towards these goals with targeted investments of scarce resources. Our current count is:

- 79 classrooms with computerized instructor stations
- 78 wireless access points
- 192 HPC cluster processors

We report our progress yearly in our annual review and mark progress to fulfill the Action Plan.

Priority: Recruit and retain an outstanding and diverse undergraduate student body.

Goal 1: Establish enrollment management process with appropriate resources and administrative structure to serve both traditional and non-traditional students, with more aggressive recruiting strategies across the entire university community in cooperation with Student Affairs.

ITS indirectly enables this goal through its partnership with Student Affairs to manage the implementation of Peoplesoft Student Administration version 8.9. We are working jointly to make the implementation successful by improving the processes used for the recruitment, admissions, disbursement of financial aid and the tracking of students' progress in their studies. Improved processes will increase service to students. The implementation at UM-Rolla and their resulting increased service to students points to the potential of the system.

Goal 8: Increase students living on campus from 1,000 to 2,500, and add appropriate housing and physical infrastructure.

ITS plays a direct role in the planning, implementation and support of technology infrastructure for students in University housing, especially in the construction of new student housing. The new facilities will have a full array of voice, data and wireless technologies to support students in their studies.

Priority: Build the quality of research, scholarship, artistic/creative activity and graduate programs. Faculty Research and Scholarship:

Goal 2: Develop appropriate research infrastructure, facilities and space.

ITS is running the second generation of cluster computing to support researchers. The High Performance Computing Collaboratory is a “virtual” computing lab space for researchers who require supranormal computing resources and is a partnership with labs in mathematics, biology, chemistry and physics. Availability of this resource has helped researchers to generate publishable papers as well as propose and obtain grants.

Goal 8: Increase collaborative interactions with university and corporate research groups across the region in shared technology, pursuit of joint research, and problem-solving projects.

ITS directly works with the Office of Research Administration on potential partnerships with research groups in the region. An example is our joint work in planning the IT Incubator facility and Center for High Performance Computing. In addition, we participate in regional collaborations with colleagues at Saint Louis University, Washington University, Lindenwood, etc. to strengthen the region’s technological base. Events such as the annual High Performance Computing Days attract participants from around the region and the state; they are an indirect contribution to the region’s technological capacity and strong attendance confirms the value of these activities.

ITS also worked with a student initiative to establish a student-run radio station. Endorsed by the Chancellor’s Office, this station broadcasts on FM as well as the Internet. We are currently collaborating with the College of Fine Arts and Communications, the Chancellor’s Office and Express Scripts to establish a joint use video studio.

Priority: Enhance civic engagement for economic and social benefit of the region.

Goal 4: Continue planning and development of a business, technology & research park next to campus.

ITS continues to work with the Research Office on the planning for the IT Incubator facility and associated Center for High Performance Computing. The HPC Collaboratory is precursor and core of this Center.

Goal 7: Establish the Performing Arts Center as a financially-stable resource for both the external community and the educational programs on campus.

ITS provides direct technical support for the PAC, including its ticketing system. This support indirectly contributes to financial sustainability; a Memorandum of Understanding recognizes ITS's contribution and formalizes the two units' respective roles and responsibilities.

3 Performance

3.1 Instruments

ITS measures our unit's performance by outcomes, captured in a variety of qualitative and quantitative forms. The ultimate outcome, flowing from our mission, is of course the success of our constituencies – faculty, staff and students. If they are successful, then we are successful.

The nature of infrastructure itself hampers our contemplation of outcomes – much of our work is out of sight, especially when it is done well. Naturally, we have conventional measurements of IT success such as availability and reliability (“uptime”). Outcomes related to learning and research output are what we might term “higher order” outcomes, and can be difficult to connect to successful infrastructure. Indeed, these outcomes can sometimes only be linked in a negative way. Like your heart, when infrastructure is functioning well, you hardly know it's there, but when it doesn't work, higher order functions are difficult to achieve.

Determining the causal relationships between the outcomes that we can measure as an operational unit and the outcomes for student learning will continue to require improvement of our instruments through cooperation with Academic Affairs and experts in assessment. While the instruments we describe below can get close to measuring higher order outcomes, the reality is that many of our metrics are “inputs” that contribute to the “outputs” of student learning.

In spite of the aforementioned complexities, most other universities explicitly or implicitly connect the presence of good technology support to teaching, learning and research. The annual *Yahoo* ranking of “most-wired” campuses is one popular indication. Academic and professional publications¹ also describe the linkages.

Our instruments for measuring outcomes include surveys, analysis of logs gathered using technical means (web server logs, telephone logs, helpdesk call tracking logs, etc) and annual reviews of the department. These instruments have been applied at least on an annual basis; some surveys are done each semester while logging tools are used daily. Regular measurement has built a record over time of many key performance indicators and allows us to track long-term trends.

¹ *Campus Technology; Educause Quarterly; Educause*

Individual staff performance is reviewed annually by the staff person's supervisor. The review includes setting goals and objectives for the next year. Goals include general ones that relate to ITS and university missions as well as specific targets for the individual. Performance reviews extend to the Associate Vice Chancellor for IT (AVCIT). In November 2005, the AVCIT also instituted the first survey of staff regarding their perceptions of his performance.

We also review our response to specific incidents when they occur. For instance, unforeseen circumstances such as power outages caused by severe weather, combined with failure of certain pieces of equipment can cause a service such as email to be unavailable for a period of time. Most power outages are easily handled by various failsafe mechanisms, but when they have caused problems, they are resolved as expeditiously as possible and communicated to the campus as quickly and as often as needed. We hold detailed "post-mortem" reviews after the incident to learn how to handle future incidents more quickly and to develop additional failsafe mechanisms. These reviews are held in an environment that does not seek to cast blame, but focuses on improving our ability to respond and on minimizing service outages in the future.

These various forms of review are important for establishing a culture of constant improvement and of evidence-based decision-making. We act on survey results and performance indicators to change our processes and our behavior if necessary. We also adjust our instruments as necessary to improve their ability to provide usable evidence.

An area that requires improvement is in the response rate to surveys – the rates are often low, especially for those that are online. For critical metrics such as those for MyGateway usage and for classrooms/lab usage, we work with instructors and lab personnel to directly encourage students to respond in class or in a lab. We continue to improve the surveys as well as to think of creative ways to improve response rates and thereby make the survey results more meaningful.

3.2 Specific Effectiveness Measures

3.2.1 Student success

As we discussed above, measures of student success such as grades, retention and eventually life success are difficult to relate to technology support. We may consider adding questions to our surveys that ask students themselves to relate their grades to their use of technology and the availability of infrastructure. We will also add questions for faculty to consider effects of technology support on their sense of student success.

Our current surveys ask specific questions about student satisfaction and the answers are generally positive. Most telling are the qualitative comments that indicate higher satisfaction among students for courses with material on MyGateway and the consistent requests for instructors to make more use of the technology. The survey has been done four times since the Fall 2001 semester.

Some excerpts from the report² illustrate:

“Each survey indicated that student satisfaction and perceived benefits from MyGateway increase in courses where the system is used more. **Student self-reports in each of these surveys indicate an increased engagement in courses (defined as spending more time on the course) in high use classes. More significantly, each iteration of the survey found that student intent to take additional classes and complete their degree at UMSL is increased by use of MyGateway** [emphasis in the original].”

“The use of MyGateway is leading to changes in how students and instructors define their respective roles in the classroom. **Student perceptions, attitudes, and behaviors documented in this survey, and the consistency of these findings over the previous four years, highlight MyGateway’s contribution to furthering strategic campus goals:**

- **Recruitment**
- **Retention**
- **Student engagement**
- **Community building** [emphasis in the original]...”

Quantitative measures of outcome include:

“**Student Satisfaction** – students in classes with high use of MyGateway were statistically

- more likely ($p < .0004$) to:
- agree that they are very satisfied with the course (Question 20)
- take another course at UMSL because of MyGateway (Question 30)
- complete their degree at UMSL because of MyGateway (Question 31)
- agree that they were more able to seek clarification (Question 8)...”

while quantitative measures of factors affecting student learning (inputs) include:

“Nearly 65% of the students indicated they accessed MyGateway two or more days a week for their course work.”

“**Learning Activities** – students in classes with high use of MyGateway were more likely ($p < .0004$) to:

- seek clarification when they did not understand something (Question 9)
- review lecture notes for clarification (Question 10)
- receive instructor feedback quickly (Question 11)
- spend more time studying (Question 15)
- do better in their class (learn more) (Question 19)
- find the use of online quizzes helpful (Question 24)

² Robert Keel, Cheryl Bielema, Robert Keel, et al., “Comprehensive Evaluation of MyGateway Use by Faculty and Students: WS 2005.”

- find access to course grades helped them stay more engaged (Question 25)
- report online discussions made them think more about course topics (Question 26)
- complete course assignments (Question 27)…”

“**Communication**– students in classes with high use of MyGateway were statistically more likely ($p < .0004$) to:

- communicate with their instructor (Question 16)
- communicate with other students in the course (Question 12)
- work in online groups (Question 13)
- work in face-to-face groups (Question 14)

Benefits to students in face-to-face, hybrid (mixture of class sessions and online activity), or online courses were similar to the previous year’s list.

- Immediate access to grades and other course information and tracking individual progress
- Ability to communicate with professors and classmates
- Convenient and expedient means to complete course work
- Personal organization
- Time and travel to campus saved
- Connection to campus strengthened…”

3.2.2 Faculty success

The MyGateway survey paper results are also indicators of faculty success – the following excerpted graph³ shows that the use of MyGateway has grown steadily in the past four years.

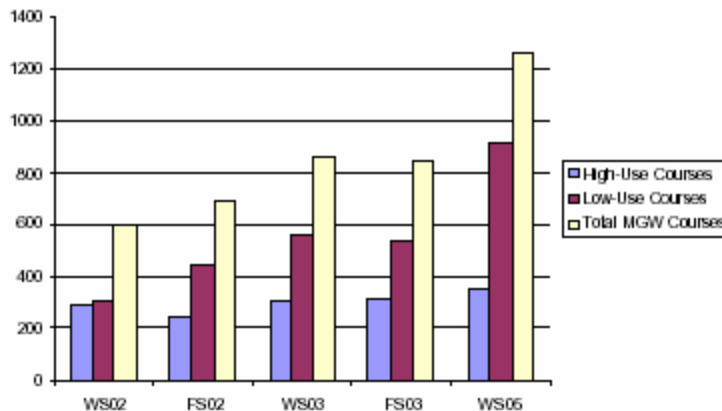


Figure A: Courses Using MyGateway

However, the paper also cautions that:

³ *Ibid*, pg.3

“... the number of courses making extensive use of MyGateway has not increased at the same pace as those categorized as "low-use" courses. *Although our survey analysis indicates a significant correlation between MyGateway use and student satisfaction, engagement, and retention, our efforts to encourage faculty to explore the full potential of MyGateway needs to be extended.* [italics in the original]”

More direct indicators of their success include the growth in the number of presentations at the Fall Technology and Teaching Conferences as well as the number of recipients of the annual Exemplary use of MyGateway awards. The latter awards are based on quantitative data obtained from webserver logs of usage of MyGateway content in each course.

Although the Innovation Grants in the Fall of 2005 are relatively new, we obtained over thirty good proposals – a heartening indicator of the direction of faculty thinking towards the integration of technology with teaching. We were only able to award seven, but could have justified awarding ten or more.

3.2.3 Effectiveness of Technology Support Center

We recently surveyed faculty, staff and students about their use of the Technology Support Center. They are asked to rate their experience on a 7 point Likert scale (1 is worst; 7 is best). Questions include:

- promptness
- courtesy
- ability to solve the problem
- overall satisfaction

The most prevalent ratings are 6 and 7, and the average is about 6. Answers to the qualitative question “What improvements would you like to see made to the Technology Support Center” are generally positive, but also include specific suggestions as well as particular issues to address.

Behind the scenes, we also track quantitative measures such as:

- number of work orders by category
- average work order duration
- number of calls answered by category of skill
- delays in answering calls, average and maximum delays
- average calls per hour by each agent

We need build on this recent data to develop analyses that help us improve the operations. Simple improvements such as “reduce the average work order duration” may not have desired effects, since we need to account for the complexity of the work order.

3.2.4 Effectiveness of labs and classrooms

We also survey faculty and students about their use of computer labs and technology-enabled classrooms. These surveys have been done consistently since 2001; they were done in prior years, but irregularly.

Student ratings (Fall 2005)

The surveys of students asked questions that had possible responses of “yes/no/not applicable” or “disagree/disagree/neutral/agree/strongly agree.” Questions included:

- Do you access UMSL course material and/or take classes over the internet from work (47% Yes)
- In your opinion, could this course be taught without the student workstations? (72% No)
- Does this course require you to use the workstations? (74% Yes)
- How would you rate the overall classroom support? (96% Good/VGood)

For a specific question about student success, 78% of respondents “Agreed” or “Strongly Agreed” that “I learned better in a course using a technology enhanced classroom”.

Faculty ratings (Fall 2005)

The surveys of faculty were similar to those for students. Questions included:

- How frequently did this class meet in a Technology Enhanced Classroom? (92% answered “Every class period”).
- Did you find the instructions for the ceiling-mounted LCD projector posted in the room helpful? (95% answered “Yes” or “Didn’t refer to instructions”).
- Did you use Blackboard (mygateway.umsl.edu) for this course? (87% answered “Yes”).

In another specific question about student success, but aimed at faculty, 91% of respondents felt that their students learned better in a technology enhanced classroom than in a traditional classroom.

The ratings of overall experiences with classrooms and labs that are “Good” or “Very good” are consistently reported above 94% and range up to 99%.

We also track overall usage of the computer labs by gathering data on log-ins. This was one mechanism we used to answer the question of the usage of labs through a daily cycle. For management purposes, we track data such as the usage of particular software

programs to form independent judgments of their continuing usefulness and the possible need for substitutes.

3.2.5 Direct feedback

Faculty, staff and students often provide feedback directly in correspondence (verbal, written and electronic), to all levels in the ITS organization. We welcome all such correspondence and act on issues raised. Of course, we're grateful for the positive comments – and we do get them.

Many of our staff have worked for the University for many years and have an extensive network of personal contacts. These informal interactions are also valuable channels of communication for positive and negative feedback.

3.2.6 Peer recognition

Our staff have been invited to give presentations at regional and national conferences on the work they've done; they have also had proposals for presentations accepted. These have included:

- UMSL's approach to Single Sign-on
- Development of MyGateway from the base Blackboard course management software
- Findings from the MyGateway surveys

3.2.7 Staff survey of AVCIT

The survey combined questions on a 5-point Likert scale – “strongly disagree” (1) to “strongly agree” (5) with open-ended questions that tried to capture more qualitative factors. The quantitative questions fell in several broad categories.

Institutional Objectives

1. ITS direction is aligned with the University's mission (mean=4.2; median=4)
2. ITS meets the current needs of campus (mean=4; median=4)
3. ITS anticipates the future needs of campus (mean=3.9; median=4)
4. Promote teamwork between ITS and other units across campus (mean=4.05; median=4)
5. ITS is flexible in its approach to serving the needs of campus (mean=3.78; median=4)

Organizational Objectives

6. Create an open and transparent organization (mean=3.33; median=3)
7. Consistent in applying policies (mean=3.2; median=3)
8. Set clear objectives (mean=3.52; median=4)
9. Promote teamwork between the subgroups within ITS (mean=3.48; median=4)

Creating a good workplace

10. Challenges you to be creative and forward-looking (mean=3.85; median=4)
11. Help you be successful in your job (mean=3.67; median=4)
12. Make ITS an enjoyable place to work (mean=3.64; median=4)
13. Have an “open-door” policy (mean=3.83; median=4)

Although generally positive, opinions seemed to vary about the organizational objectives, and that was an area that had the most variation in numerical responses. This indicated that the AVCIT and the organization needed to work harder on openness, consistency, clear objectives and teamwork.

People are generally positive about the workplace, but we do need to pay continued attention to helping staff be successful and making this a good place to work.

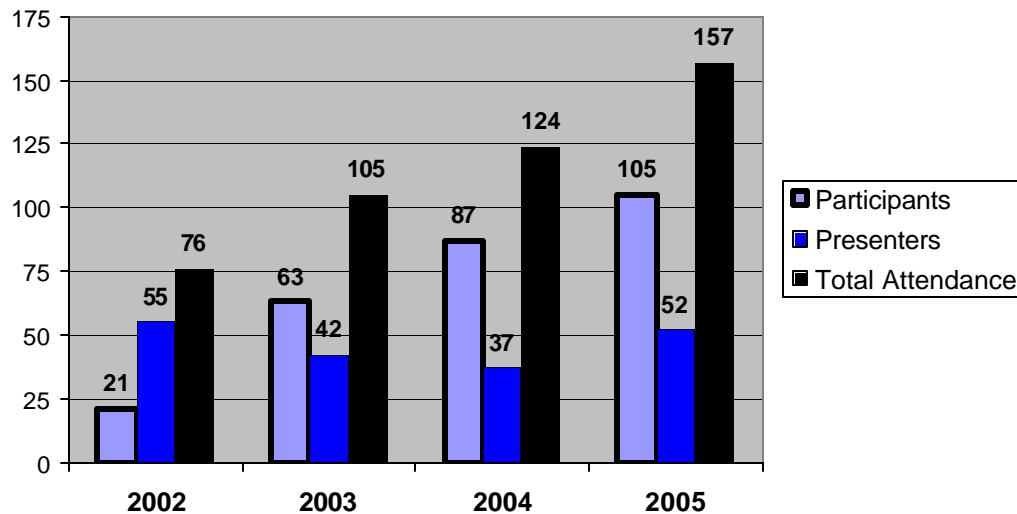
Comments were generally positive about skilled and hardworking staff and the work environment; most people had a good sense of UMSL’s and ITS’s mission. Some specific areas of improvement include:

- continue to develop management skills in folks who have supervisory responsibility
- ensure that we treat staff consistently across the organization
- communicate better within ITS as well as with the rest of campus (and beyond!)
- continue to provide training opportunities
- provide ways for people to take calculated risks
- improve the job performance evaluation process

3.2.8 Attendance at events

The Fall Teaching and Technology Conference (FTTC) has been held for several years; other special events we’ve held are a relatively recent development. Even in that short time, we’ve seen the attendance grow.

Teaching with Technology Conferences 2002-2005⁴



High Performance Computing Day attracted about 100 people in 2006 compared to about 50 in 2005. We've held seven Technology and Career Briefings in Academic Year 2005-2006; the attendance has grown from 20 at the first to about 100 at the last. We attribute the growth in this area to particular topics as well as increased publicity which raised awareness.

Growth in attendance at other events is also attributable to increased awareness in the community about technology. It is a measure of effectiveness of the events and the publicity about the events.

We've received many positive comments and thanks from attendees, and even from people who couldn't attend, but were grateful for the opportunity. We also have formal evaluations of most events.

4 Governance

4.1 Decision-making

We have described above how we draw our priorities from overall campus priorities. ITS objectives contribute generally and specifically to the Action Plan. As highly trained technologists, we use our best professional judgment to bring forward relevant technological advances that can benefit the University's mission. While our judgment is tempered by the revealed needs of campus constituents, ITS has also had to take a

⁴ From Center for Teaching and Learning Self-Study, April 2006

leadership role at times – being “gently provocative” in bringing new services or technologies to campus. Unlike other service areas, our basis is technology and technology advances quickly, so leadership is often necessary to meet our mission. However, we keep the purpose of enhancing teaching, learning and research at the top of our minds, and do not implement technology simply for its own sake.

The campus has a formal advisory structure – the University Assembly Information Technology committee is composed of members from across the campus, drawn from faculty, staff and students. The committee advises the Associate Vice Chancellor for Information Technology on strategy and tactics for development of technology services. There are three subcommittees for deeper discussion in particular domains of interest:

- Research
- Instruction
- Services

For example, recently the Instruction Subcommittee began to bring together interested parties from across campus in a Provost’s Forum to discuss the creation of more flexible classrooms – environments that are more conducive to collaboration and interaction than traditional “sage on the stage” arrangements. These ideas will inform ITS’s development of the next generation of technology-enabled classrooms.

4.2 Internal processes

ITS internal processes continue to develop based on the outcomes identified through the instruments described above, on recommendations from the Advisory Committees, on best practices at other institutions and on internal improvement initiatives.

Keeping staff expertise current is an ongoing challenge – technology continues to advance quickly and our staff need to be current in areas ranging from deep infrastructure (networking, servers, information security, etc.), to application development, to new ways to apply technology to teaching and learning. As well, objectives arising from overarching university priorities can challenge any static notion of expertise – we must often anticipate the expertise required to meet future needs. Staff are encouraged to be self-motivating in their training needs, although specific areas of need are also suggested by supervisors. Many of our staff pursue advanced degrees or industry certifications.

In addition to keeping current with technology, ITS needs to develop its supervisors and managers. Our staff are often hired and promoted on the basis of their technical expertise, but that also means that as they take on managerial roles, staff need to develop their skills in that domain as well. ITS has enthusiastically embraced the Administrative Leadership Development Program instituted by UM in 2005, sending several senior managers in 2005 and 2006 to take advantage of the opportunity to learn.

We have also brought in focused management development seminars, sent supervisors to training programs sponsored by HR and sent managers to the “mini-MBA” programs given by Continuing Education.

ITS strives to be open and transparent in its internal decision-making processes, even if there are areas that must remain confidential. Senior managers share and discuss major policy decisions, including budgetary impacts. We have made progress in a “planning-based” approach to budgeting, where team leaders are asked to budget according to plans that speak to ITS and University missions rather than simply repeat the previous year’s budget. Strategies and major technological directions are discussed and formed in regular managerial meetings. Information, progress and decisions are shared and discussed in regular meetings of team leads; outcomes of these meetings are made available to all staff.

We have monthly team-building meetings attended by most staff where we recognize staff achievements and progress towards our goals. Quarterly meetings of all staff are another venue for sharing information and progress.

In the staff review of the AVCIT’s progress in November 2005, the outcome was generally positive as to how well this openness and transparency had been achieved. Shared decision-making and open communication require some cultural change in the ITS organization, so this area is a work in progress. The AVCIT also needs to continue to develop his approach.

4.3 Supporting Constituents

Stakeholder engagement

In addition to the formal governance structure described above, ITS uses several other mechanisms to engage its stakeholders, including:

- Faculty liaisons: representatives from each department (administrative as well as academic) who are our direct channel of communications to and from the departments. ITS meets with them every semester at a minimum; the liaisons are also usually the first points of contact for policy issues.
- The Technology Support Center (TSC): the “helpdesk” is not only our first level of support for technical issues, but is an important mechanism to identify needs that lead to changes in our services, processes and objectives.
- Agreements formalized as Memoranda of Understanding: in cases where interdepartmental relationships may be complex, especially those that involve joint budgets, ITS and the partner department jointly prepare a MOU; these help to clarify roles and responsibilities. The partnerships with the CTL, the Library and the PAC are examples covered by written MOU.

- Publication of *Iterations*, a printed and online newsletter issued in Fall and Spring semesters that contains highlights of ITS activities and new information. *Iterations* is distributed to all faculty and staff.
- Direct outreach to departments: visits to colleges and departments by our Information Security team and similar upcoming visits by the Faculty Resource Center.
- General openness: ITS is open at all levels within the organization. While the TSC is usually the most efficient mechanism to resolve basic issues quickly, we encourage all staff within ITS to be approachable. Some issues, particularly those relating to policy, go directly to the AVCIT, who fosters openness as a principle. This openness to our constituents also requires openness within the organization so that issues can be communicated quickly to the right people for resolution.

Policies

Major ITS policies are posted on webpages accessible from the University's and ITS main pages. The Appropriate Use Policies for UMSL and the UM System are examples of these institutional policies that govern the use of information technology. These policies are modified from time to time through consultation with the University Assembly IT Committee.

Other policies and processes are consistent with ITS's mission. For example, standardizing desktop computers is more cost-effective overall for the institution. Some exceptions may apply in cases of specialized research computing, but in the main, standardized computers reduces capital costs as well as ongoing support costs. This helps the University provide affordable education for students.

Some policies have been in place for some time. One example is the "Desktop Systems Program (DSP)," which provides funding for the regular replacement of desktop computers; this has historical and complex cost drivers. At the request of several departments, ITS is currently reviewing the program so that the costs and the justification for various components are more transparent. Charges for "network ports" are also under review; the two programs are in fact closely linked, since network access is one of the service components imbedded in the costs of the DSP.

4.4 Collaboration

ITS maintains strong partnerships with other parts of UMSL. Partnerships extend to the other campuses of the University of Missouri as well as companies and other entities external to the University.

Collaboration with the other campuses of UM is formalized in membership of the AVCIT in the UMSystem IT Leadership Council. The President of UMSystem also

appointed the AVCIT as an Associate Vice President for Information Systems at the System level. In that position, the AVCIT advises on System-wide technology strategy.

Our relationship with the Center for Teaching and Learning has a long history and has been key to engaging faculty. We have already mentioned co-sponsorship of many events and workshops.

We have a close linkage with the College of Education and its Teaching and Learning Center. At a practical level, we share responsibilities for support of students and faculty in South Campus. We also cooperate on important strategic initiatives. For example, the Director (and Endowed Professor) of the TLC is co-principal investigator with the AVCIT for an Excelsior Grant from SBC to promote the use of e-portfolio systems on campus, a promising new technology for assessment of learning for students, faculty and staff.

Our relationship with the Library is long-standing. Our two units partnered in establishing computer labs within the two libraries on North and South Campus. We have a staff member with joint appointments in ITS and the Library – this staff person provides direct support for technological needs in the Library and is also a conduit for information and requirements to and from ITS.

ITS has always worked with academic departments in disciplines closely allied to our work, such as Management Information Systems in the College of Business and Mathematics and Computer Science in the College of Arts and Science. The AVCIT is a member of the Board of Visitors for MIS. The Board provides advice to the department in curriculum, outreach and other issues important to student learning. In the past, ITS funded graduate assistantships in Computer Science to meet specific objectives.

The History Department has had a grant for several years to work on Virtual Saint Louis, a project to develop a software system that displays 3-D models of buildings past and extant that are historically significant. ITS provided personnel and computing resources for this effort, and has committed in-kind support to a current grant proposal for further development.

When the Mathematics department and the Office of the Dean of the College of Arts and Science needed to create a learning center to support new methods of mathematics instruction, ITS participated with planning, funding and a cost-effective way to realize this new lab. The Math Technology Learning Center is now another open student lab as well as an important component for student success in mathematics learning.

ITS shares its video production studio space and personnel with the Media Arts and Communications department. Our staff supports classes and projects in video communications which directly enhances student learning in that subject. As well, ITS created a high-end Macintosh lab primarily for video editing, yet the facility adheres to the principle of open labs; it is available for use by all students.

As mentioned above, pursuant to the Action Plan, ITS is maintaining the second generation of cluster (parallel) computers in its high-performance computing facility. Our staff support researchers and students in computer science, biology and chemistry in their research on topics that include evolutionary algorithms, systems ecology and drug design.

About a year ago, our security team began an outreach program to visit departments and Colleges to talk about information security directly to faculty, staff and students. Information security issues increasingly haunt our use of information technology, threatening our effective use of powerful tools. While we deploy sophisticated tools behind the scenes to stop security attacks, user education in “safe and secure” computing is an important defense. The security team was invited to share this outreach program at regional conferences as a model for other institutions. The Faculty Resource Center recently adopted a similar outreach model to bring technology help directly to departmental meetings so that faculty could more easily get the information required to make effective use of technology in their teaching.

ITS works closely with administrative departments as well as academic departments. We help the Police and Locksmiths support the ID card system and collaborated with the Police to extend computer lab hours in response to student demand. We have long partnered with the University Bookstore to provide convenient and cost-effective technology purchasing options for students.

The UM President made the Student Affairs department responsible for managing the implementation of the Student Administration module of the PeopleSoft ERP software system. Recognizing the software’s importance to effective administration of student records and finances, ITS is working closely with Student Affairs to ensure a successful implementation. We are devoting significant staff resources to this effort and the AVCIT shares governance of this project with the Associate Vice Provost for Enrollment Management.

ITS collaborates with our sister organizations at the other campuses of UM. Although we have informally shared information and best practices for some time, the campus IT units have recently begun more formal collaborations. Several projects currently under consideration were sparked by suggestions from UMSystem President Floyd, including:

- consolidation of email services
- consolidation of helpdesk activities
- coordination of technology purchases and procurement policies

A grassroots collaboration among UM campuses was also begun around the support of the Blackboard Course Management System (the basis for MyGateway at UMSL). Arising in January 2005 because of the difficulties with support from the Blackboard company, the collaboration has evolved and deepened over the months. Work is now underway as part of the strengthening of MyGateway infrastructure to have UMSL host

the software system for UMR and UMKC. This is an indicator of confidence in UMSL ITS from our peers, although this is a collaborative endeavor.

We have coordinated several purchases of equipment among the UM campuses, primarily from vendors in common. Several of these bulk purchases have reached close to or above \$1 Million and have obtained extra discounts up to 5% to 10% beyond our usual discounts.

We have extended our collaborations beyond UM campuses to other institutions and industry in the region. Examples include:

- the High Performance Computing Days were attended by people from the region and the state
- the Apple podcasting events were attended by educational institutions in the region, including K-12
- the Focus on Teaching and Technology conference was attended by our partners from local community colleges
- the Technology and Career Briefings brought in speakers from companies in the region and were attended by members of the wider community as well as campus constituents.

5 The Future

To continue to fulfill our mission, ITS must be a change agent for academic and administrative processes. That is not to say that technology should be the reason for change – business and academic needs should be the reasons. However, examples abound of the most successful enterprises being those that have used technology to change the way they do business. Indeed, technology has already changed the way we work and learn; ITS can help UMSL take advantage of those advances. To do this, ITS must itself continue to change, to improve the way we:

- plan
- support
- implement
- collaborate
- communicate

5.1 Lessons Learned

We have found that openness works in general, even though the approach may make us vulnerable to charges of “Pollyannaism.” Success in working with our constituents has

often been the product of being open about issues, challenges and difficulties. This was the case in constructing a Memorandum of Understanding with the PAC and building the Math Technology Learning Center. Not all situations end in “win-win,” however; but even if a constituent does not agree with a conclusion or result, openness means all parties increase their understanding. Such was the case with the need to create a financially sustainable model to support the security of patient data in the Psychology Department.

Related to openness, collaboration has also been important, even when it’s been difficult for reasons that may include history, mistrust, lack of information and, in the case of other campuses, physical distance. The Blackboard intercampus collaboration illustrates how quickly we can arrive at a useful conclusion. We will not begin to see the final results for another six months, but the direction is very promising. The PeopleSoft collaboration between ITS and Student Affairs is another example.

The whole administrative review process has been oriented around outcomes, especially for student learning, so it is not surprising that we also consider measurement or metrics important. The longitudinal record represented by the regular MyGateway usage surveys have been valuable in convincing the Deans’ Council, faculty and other stakeholders in the role that technology can play in enhancing teaching and learning as well as student satisfaction.

Creating excitement or “buzz” is also important. Many of us who work at the interface between technology and learning are convinced of the importance of our calling – conveying that passion to our constituents is also important. Events such as the Fall Conference, the various Provost’s Forums and the High Performance Computing Days have taught us that generating excitement is a legitimate way to communicate, making the content even more effective.

5.2 New Initiatives

ITS has several change initiatives underway and planned. The following sections describe the highest priority items. Pursuant to the principles of the administrative review, the initiatives here are in addition to ongoing improvements to meet Action Plan requirements, regular infrastructure upgrades, etc.

5.2.1 PeopleSoft/Oracle

We have mentioned ITS’s partnership with Student Affairs in the implementation of PS Student Administration. This in itself marks a change – previous PeopleSoft modules in Human Resources and Finance did not involve ITS. Student Affairs and ITS recognized that a close partnership would increase the chances for a successful project. For us, success means not only successful technical implementation of the software systems, but success as measured by outcomes including:

- more efficient processes
- free staff, students and faculty from low-value processes
- enable staff to help students succeed through appropriate financial aid, student advising, early warning of student difficulties

The Student Administration system is truly mission critical, since admissions, recruitment, financial aid, registration, student records and cashiers are key to the operations of the university. Without students, there can be no student success and no university.

This view of administrative software as an enabler for process change is new; process change is also difficult.

The UM System previously adopted the Human Resources and Financial Records modules of PeopleSoft (now owned by Oracle) large-scale Enterprise Resource Planning. Those implementations have done little to change the administrative processes. We hope to apply what we learn through this model of cooperation in student administration to improve processes in other administrative areas, using the capabilities in the PeopleSoft systems.

The overall outcomes will include:

- successful technical and functional implementation of PeopleSoft/SA
- streamlined administration
- reduced bureaucracy
- self-service

Specific metrics will include:

- reduction in number of steps required to complete administrative tasks
- number of processes made more efficient
- reduction in time required for tasks, measured in elapsed time as well as time on task – response time to users
- number of tasks moved to self-service
- increase in number of Peoplesoft functions available and used
- qualitative changes in the way we think about administrative processes

Responsible parties:

The Associate Vice Chancellor for IT in partnership with the Associate Vice Provost for Enrollment Management, with the executive commitment of the Provost and the Vice Chancellor for Managerial and Technological Services.

5.2.2 Dashboard indicators

ITS intends to extend its policy of openness and transparency to real-time indicators. We have begun work on mechanisms to display a number of performance metrics directly online for our constituents and the world to view. In the IT industry these indicators are called “dashboards” and convey the image of a car’s indicators of speed, engine health, etc.

We will begin with displaying indicators of various usages of MyGateway, a key system for teaching and learning. Indicators might include:

- number of students and faculty online
- use of gradebook
- use of tests
- use of course materials
- average “uptime”
- overall system load
- average response time

These indicators can be graphs over time as well as point-in-time.

Over time, we will develop suitable indicators for other operations such as the network, server systems, use of high-performance computing.

Responsible Parties:

The Director of User Services and the Director of Computing Services.

5.2.3 Structured application software development processes

Like many small IT support organizations, ITS at UMSL has grown its application development organically in response to needs. We continue to design and build relatively small software systems for departments around campus. Even with the advent of the large-scale PeopleSoft ERP system, we anticipate that ITS will continue to require development of small computer applications that utilize and interact with the ERP core, but are tailored more closely to the needs of campus. As we try to streamline more administrative processes using technology, there will be more demand for these development activities. Current examples are:

- interface applications that make it easier for Faculty and Students to interact with legacy systems, including:
 - Student specific information such as report cards, schedules and Degree Audit;
 - Faculty needed information such as photo rosters, Advisor degree audit, pre-requisite checking.
- Aid Student Services in streamlining their support of various Academic areas including:

- Web based grade entry system that interfaces with CICS and BlackBoard's GradeBook;
- Advanced Credit Application System for High Schools, an intra-net that provides a central area for collecting various data
- Other administrative applications including
 - Continuing Education Registration,
 - Disability Tracking System,
 - Parking Permit Assignment
 - Telephone billing.

We have begun to adopt a more disciplined approach to application development – with more formal methodologies that:

- Gather requirements
- Model use cases
- Use prototyping tools to rapidly match requirements to potential solutions
- Document software for ease of maintenance

One challenge will be to be disciplined without creating more bureaucracy for ourselves and our users.

The overall outcomes will include:

- increased ability to meet the needs for campus application development without increasing resources
- increased ability of our constituents to meet student and faculty needs
- better match of solutions to requirements
- less rework and wasted effort

Specific metrics will include:

- qualitative and quantitative “fit” of solutions to requirements as measured by differences between user expectations and the final product
- time to develop the application, measured in elapsed time as well as time on project
- size of library of re-usable components, and the amount of re-use

Responsible Parties:

The Database Programmer/Analyst-Principal and the Business Technology Analysts.

5.2.4 Project management (PM)

As well as better software development methodologies, we will need to adopt better project management processes. Hitherto, ITS has managed projects relatively informally. Because of the anticipated growth in demand, we will need more discipline in order to increase our effectiveness.

As we begin the implementation of PeopleSoft SA, we plan to engage a project manager on a consulting basis to help us manage that project correctly from the start.

Other areas in ITS will also need the discipline of project management, so we have begun to develop staff expertise in PM. We began specialized training last year and will intensify our efforts.

Overall outcomes will include:

- successful technical and functional implementation of PeopleSoft/SA
- increased ability to meet the needs for projects without increasing resources

Specific metrics will include:

- number of projects using PM methods
- time to complete projects, measured in elapsed time as well as time on project

Responsible Parties:

The Manager of Fiscal/Business Operations, the Database Programmer/Analyst-Principal and the Business Technology Analysts.

5.2.5 Need for improved instruments

We mentioned above the need to match measures of student success more directly to ITS activities. Measures might include:

- grades
- satisfaction with the learning experience
- years required to complete degree
- career success

As described above, the MyGateway surveys give qualitative evidence of enhanced student satisfaction and some evidence of better achievement. The connection of other metrics to student success is more tenuous, yet these connections need to be made. In the longer term of course, the University itself needs better measures of student success. Our metrics will have to evolve along with those measures.

Our instruments need further development because we will need better metrics. We also rely heavily on surveys – the questions and format need further development to focus on

the real issues. One example would be to include questions that directly probe the relationship between student success and their use of technology as well as the quality of technical support.

Responsible Parties:

The Associate Vice Chancellor for IT and ITS senior managers, informed by the Office of the Provost.

5.3 Commitment to Improvement

5.3.1 Highest Priority

Of the “new” initiatives above, we consider the PeopleSoft implementation to have the highest current priority. The student information system is truly “mission-critical,” and will represent the single biggest commitment of campus funding, time and personnel resources to an IT initiative in the next few years. The system and associated changes in business processes also have the biggest potential pay-off of any IT initiative.

Success in this initiative will also model changes in the use of other PeopleSoft modules to effect process change in Financial and Human Resource administration. As well, the initiative will demonstrate ways in which we can leverage the core PeopleSoft application into modern application architectures, providing us better ways to meet future needs.

Groundwork has already been laid for a cohesive approach to the Peoplesoft initiative from ITS and Student Affairs. We also have Executive support from the Provost and the Vice Chancellor for Managerial and Technological Services. The project will require extra funding for “backfill” positions to take the place of people who will work nearly full-time on the project. As of this writing, the budget has been proposed and awaits executive approval.

Our initiatives in application development and project management are closely intertwined with the Peoplesoft initiative and will be important to its success as well.

5.3.2 Areas to improve

We have described many practices in which can we take pride; as with any organization, we also have room for improvement. We have described some issues above, but summarize those and others here.

Execution versus intent

Our intentions as individuals and collectively, particularly towards the University's mission, are always good. However, our execution of tasks does not always match those good intentions. Some examples include:

- Incident reviews are not always free from casting blame. The tendency to try to find a “villain” is perhaps just human, but detracts from the analysis of root causes. We need to be diligent in guarding against and correcting that behavior. Part of our work in supervisory training is to coach our staff and to model good review processes.
- Communications within ITS as well as with our constituents is not always smooth or error-free. Yet, it's sometimes a fine balance between regular communications and overloading people with messages.
- The principle of openness has not entirely permeated the organization. Old habits of information hoarding still exist, and are only changed within a culture of trust. We continue to work to improve the environment so staff can feel safe to share information with each other and with our stakeholders.
- Decision-making is not always based on analysis and evidence. Even technologists sometimes make decisions based on a “gut feeling.” As with review processes, we need to continue to correct that behavior. Cooperative reviews of technical and business requirements as well as disciplined financial analysis will continue to build the correct behavior.
- We need to celebrate our successes. Our resources are often stretched – when we finish a project or task, the tendency is to move quickly on to the next task. Without degenerating into self-promotion, we do need to stop to celebrate successful project completions and jobs well-done. If people are indeed our most important asset, we need to recognize them.

Other areas for improvement (collected from preceding sections)

- Continue to develop the causal relationships between ITS outcomes and outcomes for research, teaching and learning
- Continue to improve and refine instruments, so that we're asking the right questions, measuring the right things and encouraging the right behavior.
- Develop analyses of data from operations of the Technology Support Center that help us improve
- Develop ways to improve response rate to surveys
- Develop new ways to incorporate technology into classrooms and to enable flexibility
- Continue to develop staff in technical and managerial areas

5.3.3 An example of evidence-based decision

We close with an example of a recent decision based on principles and data. In January 2006, students on the University Assembly IT Committee strongly recommended reinstating a 24-hour computer lab. Although 24-hour labs had been available in the

past, the hours had been curtailed to 7:30am-12am due to lack of use as measured by numbers of student log-ins late at night. Extended hours create security issues – for student safety as well as for equipment and premises. The student committee members were feeling some pressure from their peers however. The outcome would also have consequences for student learning and student success.

Rather than reacting one way or the other, ITS undertook a process to build a decision on evidence:

- 1) an independent survey (managed by a faculty member of the committee) of students to gauge possible demand for extended hours, for particular times and overall sought to understand the motivations for use of a 24-hour lab.
- 2) an investigation with UMSL police to review possible locations for a 24-hour lab
- 3) an internal study of possible costs in personnel and/or monitoring equipment to secure a 24-hour lab

Even with wide publicity, the survey generated relatively low response, but this is not unusual for on-line surveys. The data indicated demand somewhat past 12 midnight, but little enthusiasm for the hours past about 1 a.m.; demand picked up again at about 7 a.m. Space is scarce on campus, so it was not surprising that ITS and the police could not identify a space that could be easily secured late at night. By stretching the shifts of existing lab personnel we found we could keep certain labs open from 7 a.m. to 1 a.m. This formally extends lab hours only 2 hours a day, but is a solution that balances costs and security against the real needs identified by the survey. Lab hours are already extended for Spring Semester finals, so the revised standard hours will be implemented for Fall 2006.

We will also have in place the mechanisms to track actual usage during the extended hours so that we may continue to fine-tune the lab hours.

6 External Review Committee

6.1 Suggested membership:

Tom Brenneman (UMKC)
Vally D'Souza (UMSL faculty in CoA&S)
Joe Garavaglia (student)
Carl Hoagland (UMSL faculty in CoE)
Tamara Kratochvil (UMSL staff in Research Office)

Appendices

- I. MGW survey paper “Comprehensive Evaluation of MyGateway Use by Faculty and Students: Report of WS 2005,” Robert Keel, Cheryl Bielema, et al.
- II. Lab/classroom survey
- III. Helpdesk survey
- IV. Survey regarding 24 hour lab
- V. Staff perceptions of AVCIT