

**Report
of the
Technology Enhanced Learning Committee**

The University of Texas at Austin

November 2004

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The Committee and Its Charge

In October 2003 Executive Vice President and Provost Sheldon Ekland-Olson convened a committee of faculty, students, administrators, and staff to investigate the current and future role of technology and the manner in which it is integrated into the learning environment at the University of Texas. The charge of this Technology Enhanced Learning Committee (TELC) was to build upon and extend the excellent and very detailed report on this same topic completed in March 2000 under the direction of John C. Gilbert (Department of Chemistry and Biochemistry), and advise the provost with regard to the direction that the university should take in the future. The TELC began meeting late in the fall semester of 2003 and continued through the spring semester and into the early summer of 2004. Several guest speakers generously agreed to talk with the TELC on their topics of expertise, and these sessions greatly helped to focus the discussions of the committee (see Appendix, List of Guest Speakers). This report presents the deliberations and recommendations that resulted from those meetings.

Committee Members

Neal Armstrong*	Vice Provost for Faculty Affairs, Office of the Executive Vice President and Provost
Judy C. Ashcroft	Associate Vice President and Director, Division of Instructional Innovation and Assessment
Robert G. Bruce*	Assistant Director, Extension Instruction and Materials Center; and Director, Distance Education Center, Continuing and Extended Education
Ruth Buskirk	Senior Lecturer, Department of Molecular Genetics and Microbiology
Elizabeth Cullingford	Jane and Roland Blumberg Centennial Professor in English and Distinguished Teaching Professor, Department of English
Pat Davis	Associate Dean, College of Pharmacy
Archie Holmes	Associate Professor, Department of Electrical and Computer Engineering, College of Engineering
Brent Iverson	Professor, Department of Chemistry and Biochemistry
John Kappelman	Committee chair; Professor, Department of Anthropology
Jim Kerkhoff	Assistant Dean, College of Fine Arts
Marg Knox	Director, Office of the Vice President for Information Technology
MaryLynn Rice Lively	Associate Dean, School of Information
Min Liu	Associate Professor, Department of Curriculum and Instruction
Sue Phillips	Executive Associate Director, University of Texas Libraries
Cath Polito	Director, Center for Lifelong Engineering Education, College of Engineering
Paul Resta	Professor, Department of Curriculum and Instruction; and

Shea Matthew Suski	Director, Learning Technology Center, College of Education
Joe Sanchez	Sophomore, Department of Economics
	Graduate Student, College of Education, and Center for Instructional Technology
Susan Toalson*	Formerly Director, Distance Education Center; currently Director, Petroleum Extension Services

Ex-Officio Members

Steve Monti*	Executive Vice Provost, Office of the Executive Vice President and Provost
Dan Updegrave	Vice President for Information Technology

**Spring of 2004 replacements: Robert Bruce for Susan Toalson; Neal Armstrong for Steve Monti.*

Executive Summary

It requires only a brief glance around the campus of the University of Texas at Austin to realize that today's learning environment differs dramatically from that of a generation ago. Perhaps the most visible difference is that the many and varied consequences of the computer revolution now pervade all aspects of university life. Unlike occasional access to the card-punch mainframe computer of the past, today's students read journal articles and other library resources on-line, engage in course email chat groups, use wireless connections to review lectures or complete web-based assignments, are in nearly constant contact with their instructors via email, access high resolution 2-D images, sound, and 3-D graphics, and take multimedia computer-based examinations. Of course, identical advances have also occurred in the teaching and research mission of university faculty as well as that of administrators.

Although the computer revolution moves at its own rapid pace, it is the duty of the educational community to stay in lockstep with these advances, evaluate the changes, and incorporate the best of these into the learning environment. This effort involves tracking a moving target, with many of the most important learning advances made by the educators themselves, and it is with this point in mind that our committee has attempted to earmark critical points for consideration by the administration, faculty, and students of University of Texas. Certainly, the sky is limit when we consider what is possible when it comes to making and incorporating technological advances into the learning environment; however, given the realities of limited funding, our efforts were undertaken with an eye toward what can be accomplished both in practical terms and in a timely fashion.

It was early on in our meeting process that we reviewed the Gilbert Report of 2000. Many of us were struck by just how difficult it is to predict with any degree of confidence the trends in technology-enhanced learning. Still, the 2000 report identified four areas of concern, courses and curricula, faculty support, infrastructure, and administration, that

continue to offer a very useful mechanism with which to investigate future advances and needs. These areas are detailed in the report that follows. The major conclusions and recommendations for each area are listed below but are not presented in any ranked priority. These areas are discussed in detail in the report that follows.

Courses and Curricula (2)

- The committee recommends that course and curriculum committees continue to play an active role in evaluating the course offerings of their department with regard to quality and content and recognizes that the evaluation of TEL courses may involve additional criteria specific to the delivery mode. These committees also need to play an active role in assuring that non-UT Austin courses accepted for transfer credit also adhere to these standards.
- The committee recommends that the provost institute a system of course coding that will inform students about the necessary technology requirements of a course and offer university planners a simple tool with which they can predict future infrastructure needs.

Faculty Support (6)

- The committee recommends that the provost, working with DIIA, should explore new roles for CIT that reflect the current trend of decentralization of faculty support for the development of TEL course material. In addition, faculty should be encouraged to work with DIIA to develop methods to assess the impact of their TEL initiatives on student learning.
- The committee recommends that the provost establish a range of incentives for faculty to encourage their participation in TEL development.
- The committee recommends that deans and department chairs direct faculty curriculum committees to 1) monitor allocation of TLCs for TEL courses and 2) evaluate and monitor the pedagogical content of TEL.
- The committee recommends that the provost, working with the deans, develop language and criteria for inclusion in individual college tenure and promotion materials that provide a clearer understanding and that he review and establish guidelines for reviewing and assessing the use of technology in teaching.
- The committee recommends that the provost, working with UT System IP Office, DIIA, and deans, should educate faculty and course development teams with regard to the meaning of “default course material ownership policy” to better enable them to “red flag” those projects that should have a contract that specifies the exact ownership of course materials.
- The committee recommends that DIIA working with the provost’s office and college deans recommend revise the common CIS form so that the use of TEL in a course can be more thoroughly evaluated.

Infrastructure (6)

- The committee recommends that the provost ensure that recurrent, consistent funding is available to support TEL mission critical, high availability central services.
- The committee recommends that the provost ensure that recurrent, consistent funding is available to adequately support TEL mission critical distributed services in schools and colleges, including technology-equipped classrooms as well as actual course content and instructional modules developed by faculty.
- The committee recommends that the provost ensure that adequate funding is available to investigate possible uses for technologically innovative applications within the classroom setting and to incorporate support into the overall TEL infrastructure if developments warrant.
- The committee recommends that the provost establish an ongoing venue for a campus-wide discussion that aims to share “best practices,” evaluate commercial and other applications, and serve as a forum for the dissemination of information about TEL.
- The committee recommends that the provost should continue to stress the importance of accessibility issues with regard to technology-enhanced instruction.
- The committee recommends that the provost establish a central computer testing facility for administering computer-based examinations in a secure, proctored environment.

Administration (8)

- The committee recommends that the provost establish a committee that will be charged with the review of the various issues that surround TEL and DE activities on campus. This committee will provide information to the planning process in advance of each legislative session and recommend needed actions. Its membership of faculty, administrators, students, and staff will be drawn from across the campus and will be instrumental in sharing information about TEL, perhaps in concert with the work of ITAC, in informing both DIIA and ITS of future support needs, and in assisting in identifying opportunities for collaboration and cost sharing.
- The committee recommends that the provost continue to respond to the growing faculty and program demands for TEL support by increasing the capacity of DIIA in promoting teaching excellence, providing instructional assessment, conducting measurement and evaluation of teaching and learning, and facilitating the integration of instructional technology. In addition, the relationship among teaching, learning, and technology should be investigated in light of outcome-based learning in order to inform and assist the accreditation process and improve our record of successes.
- The committee recommends that the provost initiate a systemic change in the assignment of classrooms so that these match faculty teaching styles with regard to technology needs or group teaching.

- The committee recommends that the provost should ensure that faculty and instructional specialists have adequate input into the renovation, construction, and planned upgrades of classrooms.
- The committee recommends that the provost consider ways to facilitate efficient and appropriate processes for colleges and academic units to access student information data.
- The committee recommends that the provost convene a group to investigate the best way to align for credit courses that are developed by and offered through the Distance Education Center.
- The committee recommends that the provost include ethics training for undergraduates as a part of the implementation of the honor code.
- The committee recommends that the provost reinstitute full funding for the Faculty Computer Life-Cycle Funding Program.

Definition of Technology Enhanced Learning (TEL)

The transformation of the educational environment as fueled by the computer revolution is still in a formative and rapidly developing stage. Our review of the Gilbert Report served to highlight what has changed over the past four years even as it revealed just how difficult it is to predict long-term trends in this area. We acknowledge that there are many definitions of technology enhanced learning (TEL) and distance education (DE) and, more specifically, that wide differences exist on our campus in the usage and application of these terms. In fact, sometimes these terms are used interchangeably. Contrary to earlier predictions about the unbridled growth of distance education, it is instead the expansion of technology-enhanced learning that has experienced the most rapid growth at the University of Texas at Austin over the past four years, and explorations of this topic early on became the focus of the committee. For the purposes of this report, we offer the following definition of technology-enhanced learning:

Technology enhanced learning leverages technology to maximize learning within an environment of sound course design that can offer students the options of time, place, and pace and emphasizes different learning styles.

There is no one definition for the look or feel of a technology enhanced course; instead, this effort occurs along a very broad spectrum that at one end can include a course with only minimal technology enhancement such as a Web site with an electronic syllabus, while at the opposite end is found a robust, multimedia rich, interactive, collaborative, fully online course. Neither end of this spectrum should be viewed as intrinsically inferior or superior to the other as based solely on the level and amount of its technology; rather, differences in the degree of the integration of technology should be driven by pedagogy, course content, and desired learning objectives.

Our focus as educators must be on student learning, whenever, wherever, and however the student learns best. Technology enhanced learning represents one stage in the natural evolution of educational methods that integrates advances in pedagogy with those of design, interaction, delivery, and assessment technologies. The type and amount of technology incorporated into the instructional environment can and should vary according to the subject, the instructor, and the course's objectives. Instructional technologies have made it possible to emphasize different learning styles and offer a range of learning options that together can provide much more individualized instruction. Improved student learning should be the focus and desired outcome of these efforts, and the goals of this report are to identify the ways in which all of the various resources at the University of Texas at Austin can be applied to further this end.

Committee Process

In following the basic outline of the Gilbert Report, the TELC was divided into working groups that met separately to discuss the four major areas of interest that influence and impact technology enhanced learning. These areas are courses and curricula, faculty support, infrastructure, and administration. The results of these meetings were discussed in the committee as a whole and drafts of the report went through several versions of editing by the subcommittees and the committee as a whole. The four areas of interest are discussed below.

Courses and Curricula

Chair: Brent Iverson; *members:* Robert Bruce, Elizabeth Cullingford, Paul Resta, Susan Toalson, Shea Matthew Suski

Technology enhanced learning offers the potential to fundamentally alter the “look and feel” of courses offered at the University of Texas at Austin. The integration of technology into course design can run a wide gamut, from the simple (*e.g.*, the use of e-mail for correspondence between student and instructor) to the complex (*e.g.*, integration of on-line collaborative writing assignments, virtual experiments, etc.), and it is important to note that the full range of these applications is currently in use on our campus. The committee envisions that the popularity of these sorts of technology-enhanced teaching applications will only continue to grow, and that this growth will be generated by both student demand and faculty interest.

Guiding Principles

Although such a wide and diverse range of teaching applications may seem to complicate the instructional mission, the committee recognized two guiding principles that are common to all instructional endeavors, whether or not technology enhancement is an accessory or a central element of course design. These guiding principles are:

- 1) Faculty must strive to offer courses that adhere to the highest possible academic standards. Factors such as quality, content, rigor, and methods for evaluating student

performance must be applied equally to all courses, regardless of the mode of delivery and interaction.

2) An important mission of department- and college-level courses and curriculum committees is to insure that courses taken for credit by UT Austin students adhere to proper academic standards. While Web-based courses are different, they are **not** assumed to be of inherently lower (or higher) quality. Courses and curriculum committees are the appropriate bodies to evaluate Web-based courses as they would any other course, using identical standards to validate appropriate quality, content, rigor, and methods for evaluating student performance.

Internet-Based Course Evaluation

Technology in all of its various forms is actively being incorporated into higher education. The internet offers great potential for transforming the educational landscape as it provides an efficient new medium through which education can be delivered and received in an often real time interactive format. It is important to monitor the quality of courses taken by UT Austin students to insure that appropriate educational standards are being adhered to regardless of the mode of information delivery. As a result, UT Austin must be prepared to evaluate internet-based courses just as it does all traditional lecture-based classroom courses. This evaluation should take two forms depending on whether the courses originate from UT Austin or from an outside institution.

First, it is essential to confirm that any new Web-based courses originating from UT Austin are of the same academic standards and result in the same educational outcomes (*i.e.*, student learning) associated with the traditional lecture-based offerings on campus. Departmental course and curriculum committees should evaluate these courses, as they should any new or substantially altered course offerings. Various groups on campus such as the Center for Instructional Technology or other groups housed in individual colleges should be prepared to assist with the more technical aspects of these reviews as needed.

Second, transfer credit assigned for a Web-based course originating from elsewhere should be predicated on the same standards used to assign transfer credit for traditional courses from other colleges and universities. This latter purpose is especially timely, as the convenience of taking courses on the Internet, combined with the routine nature of electronic communication among students, might logically lead to a “lowest common denominator” mentality. Significant numbers of students might strive to identify the least rigorous Internet course that can satisfy specific degree requirements. Once found, such a course could become popular literally overnight, potentially undermining the quality of a degree program. The university must have agile and appropriate operating principles and procedures in place to prevent such a scenario, while not interfering with the numerous benefits that high quality Internet courses can provide.

The committee recommends that course and curriculum committees continue to play an active role in evaluating the course offerings of their department with regard to quality and content and recognizes that the evaluation of TEL courses may involve additional

criteria specific to the delivery mode. These committees also need to play an active role in assuring that non-UT Austin courses accepted for transfer credit also adhere to these standards.

Course Coding

Extensive use of the Internet also presents students with a new set of choices for the courses they take. Many students may prefer courses that are either entirely Web-based or use technology extensively. Conversely, many students live off campus and may not have ready access to the high-speed Internet connections that are essential for accessing such courses. Whatever the case, it is to the students' benefit that they be informed when a course is either Web-based or will require a high-speed Internet connection, so they can make appropriate choices.

It is proposed that courses described in the UT Austin course schedule have simple codes that describe when a course is Web-based or when extensive use of technology will require students to rely on high-speed internet access. The proposed codes are:

Wb: Web-based material is used in place of scheduled lectures.

HS: High-speed Internet access is recommended due to heavy reliance on large files, high-speed applications, required on-line homework, and/or on-line exams.

It will be up to the individual departments to provide the codes for each course offering, analogous to the method used currently to schedule classrooms. Compliance will be expected to improve over time as the process becomes embedded within the common practices of the university. It is understood that the definitions of "extensive use of technology" and "high-speed internet access" will be changing over time, so it is recommended that the appropriateness of an HS designation for a given course be reevaluated each year.

It is proposed that all Web-based courses (Wb) originating from UT Austin must be approved by the chairs of the appropriate departments, and that chairs be expected to charge their department courses and curriculum committees for a detailed evaluation. In other words, any course with a Wb code in the course schedule will be formally evaluated by the department courses and curriculum committee if deemed necessary by the department chair. The evaluation will assess course quality, content, rigor, and methods for evaluating student performance using the identical standards applicable to similar courses, regardless of mode of delivery. In addition, there will be an evaluation of the technical aspects of the course – that is, the detailed workings of the course Web pages – to make sure the course is both facile and robust enough for general student use. This latter evaluation will also include a determination of accessibility to students with disabilities.

Unlike for internally generated courses, monitoring all *externally* generated Web-based

courses for quality is not feasible. Therefore, it is proposed that undergraduate level Web-based courses be accepted without formal evaluation for transfer credit if they can be taken for course credit at their home institution and they originate from an accredited Texas college or university or from another U.S. research I university. Such a policy would remove the evaluation burden from department committees, while maintaining confidence that only high quality courses are being accepted for transfer credit. Particularly popular or notoriously low quality courses may still warrant individual scrutiny and could be rejected on a case-by-case basis if the department chair or courses and curricula committee feel they are not appropriate, do not provide adequate topical coverage, or are generally not of high enough quality. Courses originating outside of the U.S., or from a non-research I level university within the U.S., would require specific department approval to be accepted for transfer credit. Students would be encouraged to obtain departmental approval before enrolling in such a course.

Even this simple course coding will permit university planners to track the evolving landscape of course design and delivery and address the need for expanding server infrastructure in order to stay abreast of these changes. At present there is no effective method to identify, monitor, and track courses that make heavy demands on the university's computing infrastructure. The course-coding plan proposed here is simple in its design. The committee did consider proposing several more complicated course-coding plans, but in every case it was concluded that the rapid evolution of course design and delivery would render these plans obsolete before they were implemented. The two major points behind this coding plan are to provide the most critical course information to the student and to offer university planners the potential for building the needed infrastructure.

The committee recommends that the provost institute a system of course coding that will inform students about the necessary technology requirements of a course and offer university planners a simple tool with which they can predict future infrastructure needs.

Faculty Support

Chair: MaryLynn Rice Lively; members: Archie Holmes, John Kappelman, Cath Polito, Joe Sanchez

Many faculty members at the University of Texas at Austin have already made significant strides in developing and implementing Technology Enhanced Learning (TEL) applications into their courses. With a few notable exceptions (*e.g.*, the Colleges of Pharmacy and Engineering), most colleges and schools on the UT Austin campus have decided to focus on local TEL for the residential student population rather than develop initiatives in distance education. While there has been no significant shift in the faculty reward system (see below) for developing TEL courses, it is important to note that there have been some groundbreaking efforts in establishing incentives for instructional innovation and course development support systems across the campus. The committee found that these efforts have played a critical role in expanding the development effort and believes that a broader range of incentives is certain to produce an even greater

expansion of TEL across the curriculum as a whole.

TEL Development Initiatives

Over the past four years several innovation efforts have been initiated and expanded on the campus of UT Austin that support the development of TEL course offerings. Some of these efforts provide the basic means with which a course can be developed while others recognize the central role played by the individual faculty members in the development process. Some of these latter efforts have instituted various incentive programs to encourage faculty involvement. What is interesting is the broad range and diverse approach to the question of TEL course development. Of particular note are the following efforts:

- *College of Liberal Arts.* Provides 30-35 faculty grants per year and support for TEL course development for a total of about \$400,000 each year. Grants range from \$1,000 to about \$70,000 ().
- *College of Engineering.* Supports a Faculty Innovation Center for instructional innovation by providing media and instructional development services (). The goal of the center is to enhance and improve the quality of instruction in the college. The activities of the center are supported by a budget of \$850,000 (derived from student fees) and it employs 12 full-time staff members. There is some coordination of multi-sections of core or required courses, but each still requires a faculty member to “champion” the course.
- *College of Communication.* The college has an instructional design group to assist faculty in development of TEL courses, and offers course release to give faculty members training experiences on use of technology in teaching. ()
- *College of Education.* The IDEA Studio provides media and instructional design support to faculty for TEL. A Vision Awards program offers grants to 20-25 faculty to complete projects designed to enhance their courses with technology.
- *College of Fine Arts.* During the summer 2004 session, college faculty received stipends to attend special TEL training and course development sessions. ()
- *Center for Instructional Technology (part of DIIA).* The unit continues to support Fast-Tex projects. Although the awards began in 1999 with only a modest 20 awards, the program has witnessed substantial growth (2000: 58 projects; 2001: 31 projects; 2002: 36 projects; 2003: 33 projects) with 61 projects funded in 2004. Additionally, the CIT committed additional staff hours to assist faculty in their efforts to enhance their courses and teaching methods with the use of technology. CIT also supports the Annual Innovative Instructional Technology Awards Program with cash prizes to the winning projects.

Unquestionably, CIT continues to provide important expertise to the faculty from all across campus. The committee, however, also observes that TEL course development support currently is dispersed broadly across campus (as noted above by the listing of just a few of the exemplary efforts), with many of the college and school units now having developed the expertise for building course materials that are exactly tailored to their specific curricula. This observation offers a potentially exciting opportunity for CIT to play a new, more integrative role in TEL on our campus. CIT has the potential for serving as an agent for alerting the other units to new advances in TEL, as well as serving

as a catalyst for bridging shared features and best practices across diverse units. DIIA should be encouraged to develop criteria to guide faculty curriculum committees in their evaluation of pedagogical content of TEL.

The committee recommends that the provost, working with DIIA, should explore new roles for CIT that reflect the current trend of decentralization of faculty support for the development of TEL course material. In addition, faculty should be encouraged to work with DIIA to develop methods to assess the impact of their TEL initiatives on student learning.

Training and Incentives

The early efforts in developing TEL courses were largely restricted to a group of faculty now known as the “early adopters.” By and large, these were faculty members who had substantial knowledge of computer hardware and software and/or a commitment and dedication to adding the technology component to their courses. Much of this work was done by faculty members themselves, often along with graduate and in some cases undergraduate students, with varying amounts of university support. The result was that within a period of a few years, all of their courses were TEL based. Although the early adopters represent a relatively small group of faculty on our campus, some of their early and in fact continuing efforts have earned national and international recognition .

The past four years have witnessed the entry of “middle adopters” into the TEL arena. This group contrasts with the early adopter group in that, even though they too demonstrate a strong interest in TEL, they more often lack the expertise required to produce the content and the applications. The university has responded to this group by greatly expanding the range and type of assistance that it offers to faculty. For example, during the past year, CIT enrolled over 100 instructors in various courses and provided one-on-one consultation in course development, and it responded fully to requests for college- and department-specific workshops. It is much more difficult to assess the full extent of faculty, student, and staff training that occurs within the individual colleges, but it is clearly the case that these efforts have greatly expanded over the past four years.

Although training and consulting programs have proven to be successful in terms of bringing more individual faculty into TEL, it remains the case that these efforts usually require a large time investment on the part of a faculty member. The next trend that is now emerging on our campus, albeit at a small scale, is one that adds incentives to encourage faculty involvement. For example, summer stipends, release time, and special college-based training courses have begun to emerge (as noted above) as a means to encourage faculty participation in building TEL applications. Not only have these incentives proven to be critical in attracting the middle adopters, they are also beginning to attract late adopters and also add the potential of long awaited incentives to the early adopter group.

The committee recommends that the provost establish a range of incentives for faculty to encourage their participation in TEL development.

Teaching Load Credits

The Gilbert report expressed concern regarding the formula for assigning Teaching Load Credits (TLCs) for TEL courses. Although our committee did not identify a continued concern in this area, it was agreed that the allocation of TLCs is a topic for departmental course and curriculum committees. These committees are also the appropriate venue for the place where the pedagogical content of a TEL class should be evaluated (see below).

The committee recommends that deans and department chairs direct faculty curriculum committees to 1) monitor allocation of TLCs for TEL courses and 2) evaluate and monitor the pedagogical content of TEL.

Tenure, Promotion, and Post-Tenure Review □ The system of tenure, promotion, and post-tenure review at UT Austin continues to place primary emphasis on scholarship, teaching, and service. During the deliberations of this committee, conversations with faculty members who have served on college promotion and tenure committees and deans from across the campus revealed that the past four years have witnessed no significant shift in this emphasis. While there is documentation regarding these processes available at the university level (see), the exact weighting of these criteria at the level of the colleges and departments could be made clearer.

With regard to teaching, however, the committee noted that the development of TEL courses can demand an extraordinary investment of time on the part of the faculty member, often well beyond what a traditional lecture course requires; given these differences, an accurate evaluation of a TEL course probably demands an additional mix of criteria. Just because a faculty member says his or her course is TEL enriched does not necessarily make it so, and the promotion and tenure committees are encouraged to enlist the expertise that often resides within their own college or the university in order to more fully evaluate these efforts. In addition, consistent with the “arms length” evaluation provided by external review letters, promotion and tenure committees are encouraged to seek external evaluations of such TEL contributions, particularly where the impact upon the discipline extends far beyond our campus. The committee also understands that this effort represents a moving target, with the high bar of yesterday (*e.g.*, on-line chat groups programmed from scratch) becoming the low bar of today (*e.g.*, on-line chat groups automatically enabled within BlackBoard). Faculty members do, however, deserve to know if their planned investments in TEL course development will receive a thorough and complete evaluation with appropriate weighting at the time of promotion and tenure, so that they can best assess how to distribute their efforts across the areas of scholarship, teaching, and service. Extraordinary efforts in TEL should be rewarded.

The committee recommends that the provost, working with the deans, develop language and criteria for inclusion in individual college tenure and promotion materials that

provide a clearer understanding and that he review and establish guidelines for reviewing and assessing the use of technology in teaching.

Intellectual Property

Although concerns regarding intellectual property issues were raised in the Gilbert report, the committee determined that “ownership of course content” has not proven to be a problem over the past four years. The established university precedent that faculty members own their course materials has not changed, and is in fact the default “ownership” interpretation (see). Nonetheless, the levels of complexity that are now more commonly encountered in developing TEL courses often require the efforts of development teams far beyond those required for more traditional course models that represent the effort of just one individual. In such cases it may be deemed appropriate that contracts or exceptions or changes to this default ownership scenario be negotiated before the project is started.

The committee recommends that the provost, working with UT System IP Office, DIIA, and deans, should educate faculty and course development teams with regard to the meaning of “default course material ownership policy” to better enable them to “red flag” those projects that should have a contract that specifies the exact ownership of course materials.

Evaluation of Faculty Performance

As noted above, criteria for faculty tenure, promotion, and post-tenure review are developed within the individual colleges. The Course-Instructor Survey (CIS) solicits course evaluation data from the students, but the current CIS form does not provide a mechanism for students to evaluate an instructor’s appropriate use of TEL and their perceptions of the impact on student learning. DIIA is currently piloting an online CIS format that addresses this need. These data will also serve an important function in better facilitating a more thorough evaluation of teaching and student learning in the tenure, promotion, and post-tenure review processes.

The committee recommends that DIIA working with the provost’s office and college deans recommend revise the common CIS form so that the use of TEL in a course can be more thoroughly evaluated.

Infrastructure

Chair: Sue Phillips; *members:* Vic Arnold, Ruth Buskirk, Min Liu, Dan Updegrove

The overarching themes of the Gilbert report regarding the questions of infrastructure still remain as significant issues in 2004: maintaining and expanding stable funding for mission critical services, technology classrooms, and advances in the field; providing the venue for a campus-wide discussion of TEL; attaining compliance with accessibility

guidelines; and establishing testing facilities. These issues remain in the forefront today because of the inherent nature of long-term infrastructure support.

Funding for:

- Mission Critical Services

The committee recognizes that there are distinct phases to high-impact computer-based services that require different funding patterns during their life cycle. The phases include initial acquisition or implementation of a service, rapid response as demand builds quickly, regular maintenance and updates as use becomes more consistently predictable, and eventual retirement of the service from active duty. Funding must take into consideration the appropriate hardware, software, services, and support personnel during each of these distinct phases. In summer 2004 these services included the campus network, Internet connectivity and bandwidth, e-mail, course management systems, Web Central and WebSpace, UT Direct, and the digital library systems.

In addition to the more predictable or long-term services, funding must also be readily available in the short term in order to test innovative ideas and concepts that spring onto the stage in this rapidly changing field. Some of these ideas and concepts will quickly expand as the demand for the service grows, and in doing so will require stable funding as they become mission critical (*e.g.*, course management systems such as BlackBoard), while others will tend to occupy a smaller, more specialized niche, and the rest will be integrated into other systems or simply disappear.

Digital library services – including integrated searching of physical and digital collections, personalization features, and the ability to integrate these services with course management systems – are components of the campus central TEL infrastructure and have the same life-cycle funding requirements described above.

The committee recommends that the provost ensure that recurrent, consistent funding is available to support TEL mission critical, high availability central services.

- Technology Classrooms

Previous sections of this report were concerned with the development of TEL course applications, but it remains the case that the infrastructure for teaching these materials must also be available. UT Austin has made great strides over the past four years in constructing technology-ready classrooms under the direction of Joe TenBerge, chair of the University Technology Classroom Committee. In order to ensure the success of TEL, these technology classrooms must be pervasive and, where practicable, conform to campus-wide standards in order to facilitate the movement of faculty from one classroom to another without them having to re-learn how to operate the technology or reformat instructional materials. Regular, routine daily maintenance of these technology consoles and classrooms is essential to ensure that the classroom is ready whenever a class convenes. Such classrooms also require routine hardware and software updates as newer technologies become available and as equipment ages.

It must be noted that many courses and instructional modules have been developed using one-time monies, often in the form of grants from external agencies or private companies, but also from campus-wide programs aimed at encouraging technology-enhanced course development. It is frequently the case that these courses and instructional modules remain in use long after their original creators, often graduate or research assistants, have moved on and the grant has expired. Funding must be made available to update the best of these instructional materials so that they conform to changes in hardware, operating systems, and other external developments, with their content refreshed and updated.

The committee recommends that the provost ensure that recurrent, consistent funding is available to adequately support TEL mission critical distributed services in schools and colleges, including technology-equipped classrooms as well as actual course content and instructional modules developed by faculty.

- Advances in the Field

The field of computer technology is one marked by dramatic advances in both hardware and software that often result in rapid market penetration and saturation. For example, an emerging area that should be monitored closely is the rapidly changing array of personal computing or technology options used by faculty and students. In 2004, such devices include PDA's, digital cameras, digital video cameras, camera-enabled cell phones, and classroom performance systems (CPS). This is one of those areas where even small scale funding that is set aside to investigate and test the uses of these emerging technologies can result in the university developing cutting edge teaching applications. Such investigations and the testing require flexible funding options and rapid response times

The committee recommends that the provost ensure that adequate funding is available to investigate possible uses for technologically innovative applications within the classroom setting and to incorporate support into the overall TEL infrastructure if developments warrant.

Venue for a Campus-Wide Discussion of TEL

The period of the last four years has witnessed a dramatic decentralization of the TEL effort on the university campus. Unlike four years ago when CIT and a few colleges were the only units on campus building TEL applications, it is now commonplace for individual colleges and sometimes even units within colleges to have their own TEL development staff. While these individual efforts are laudable and have produced some very innovative applications, the committee also recognized that there is a growing need for a campus-wide discussion of the many themes and issues that crosscut all of these efforts. For example, questions of accessibility, intellectual property rights, and methods of evaluation are only a few of the topics that should be of concern to all TEL developers. A broad discussion could also be aimed at sharing the experiences of "best practices" with commercial software (which could potentially result in greatly reduced site licensing costs for certain software packages), hardware, OpenSource materials, and applications developed on this campus. Such efforts could achieve more consistent performances and lower overall cost and effort by reducing duplication.

This discussion venue could be organized along the lines of a committee that emulates the committee of tech deans but instead draws from the existing expertise found among the faculty and in the TEL development groups of the various colleges and schools. Other options include dedicated discussion forums within a course management system, BLOGS, seminars or informal lectures organized by CIT or DIIA, along with the involvement of the Academy of Distinguished Teachers. This discussion venue could also be used to centerpiece experimental and innovative applications that can potentially be scaled up to campus-wide adoption. A discussion venue would promote broader campus understanding and information dissemination regarding TEL and would, along with other recommendations in this report, promote more efficient and effective services to students and faculty. In particular, improved coordination between the commercial and locally developed campus TEL services as well as between central services and decentralized services would benefit the entire campus community.

The committee recommends that the provost establish an ongoing venue for a campus-wide discussion that aims to share “best practices,” evaluate commercial and other applications, and serve as a forum for the dissemination of information about TEL.

Accessibility

The university recognizes the importance of making Web-based resources and services accessible to all members of the university community, including those who have disabilities. Our TEL systems and applications must meet the accessibility guidelines adopted by the campus that are in compliance with federal standards. Faculty, students, and staff who are directly involved with developing TEL materials and resources should have assistance available, both online and face-to-face, to help them ensure that the accessibility guidelines are incorporated into course materials. In addition, all members of the university community with disabilities should have a clearly identified place where they can seek advice and assistance with accessibility issues in creating or using technology-based instructional materials. There now exist many online training modules that must be completed to demonstrate compliance with various university procedures, and it would be highly valuable to develop a training module on this topic.

The committee recommends that the provost should continue to stress the importance of accessibility issues with regard to technology-enhanced instruction.

Testing Facilities

Even as use of technology to enhance the instructional mission has increased, its parallel use in the testing environment has not kept pace. In many cases, students attend or participate in courses that incorporate a high degree of technology, including color images, audio, and animations, but are then presented with a traditional pencil and paper exam to demonstrate their mastery of the subject. Systems for practice and review, such as the Homework Service in science and mathematics, have proven successful but are not yet available to other applicable disciplines. Software and hardware are now robust

enough to permit students to take a variety of highly interactive examinations within a rich, multimedia environment that tests the students over the exact TEL materials that they are taught, and there are several successful examples currently being used on our campus. While we do not envision that computer based testing will replace the more traditional exam format, and especially the essay exam, we do feel that it has an important role in many courses as well as placement testing.

The committee recommends that the provost establish a central computer testing facility for administering computer-based examinations in a secure, proctored environment.

Administration

Chair: Judy C. Ashcroft; *members:* Neal Armstrong, Pat Davis, Jim Kerkhoff, Marg Knox, Steve Monti

Our review and deliberations served to illuminate several critical administrative issues in the area of TEL that are of concern to UT Austin. The fact that many of these issues have been addressed over the past four years is one of the reasons why our university is in the national spotlight; a renewed focus on these long term issues, when combined with fresh attention to new developments poised on the horizon, will continue to centerpiece undergraduate and graduate instruction and solidify the position of UT Austin as one of the national leaders in the area of technology-enhanced learning.

Planning and Scheduling

As noted above, contrary to earlier predictions about the growth of distance education, it is instead the expansion of technology-enhanced learning that has experienced the most rapid growth at UT Austin over the past four years. Questions about administrative issues should therefore focus more squarely on Technology Enhanced Learning (TEL) than on Distance Education (DE). Once the issue of distance education is set aside, the question becomes, “Why do we treat technology-enhanced classes differently than any others?” In most cases it seems clear that the general administrative policies at UT Austin should be applied without distinction to regular and technology-enhanced courses alike; the differences between these two types of courses generally become apparent when issues of long-term planning and infrastructure investment are discussed. If the growth of TEL courses continues at its present or an accelerated rate, the university must continue to make substantial investments in course development initiatives, technology classrooms, and support and delivery systems. Advance planning is a critical component of this effort. The committee concluded that the review of the “state of the campus” with regard to TEL as conducted by the Gilbert committee in 2000 and our group in 2004 is an effort that should in fact be ongoing. A standing committee offers several advantages over an *ad hoc* committee and should produce clear benefits over the long run.

The committee recommends that the provost establish a committee that will be charged with the review of the various issues that surround TEL and DE activities on campus. This committee will provide information to the planning process in advance of each

legislative session and recommend needed actions. Its membership of faculty, administrators, students, and staff will be drawn from across the campus and will be instrumental in sharing information about TEL, perhaps in concert with the work of ITAC, in informing both DIIA and ITS of future support needs, and in assisting in identifying opportunities for collaboration and cost sharing.

TEL Development

Given that the curriculum is under the purview of the faculty, the committee believes that administrative decisions should derive from the point of view of faculty-driven academic governance, often originating at the level of departmental course and curriculum committees, while at the same time recognizing the importance of the administration in providing the resources needed to implement these ideas. It is generally assumed that TEL produces “better” learning, but much remains to be learned in this area. Quantitative assessments of learning outcomes will assist in identifying best practices and will significantly inform the development process.

The committee recommends that the provost continue to respond to the growing faculty and program demands for TEL support by increasing the capacity of DIIA in promoting teaching excellence, providing instructional assessment, conducting measurement and evaluation of teaching and learning, and facilitating the integration of instructional technology. In addition, the relationship among teaching, learning, and technology should be investigated in light of outcome-based learning in order to inform and assist the accreditation process and improve our record of successes.

Record Keeping and Categorization

The issue of tracking course offerings with a TEL component is of critical importance when issues of long-term investment are considered. There are ways in which providing information to students can also serve to assist in this function. For example, each course offered at UT Austin should have an individual Web page that is available to students prior to registration. This page should include a detailed syllabus that provides the student with a discussion of the teaching philosophy or pedagogy, grading standards, required textbooks, use of technology, and a list of prerequisites including the expected levels of technology skills and required equipment (calculators, CPS transmitters, laptop) as well as any other pertinent information. These pages should be produced with the least burden to individual faculty, using information technology to integrate existing information wherever possible. Once completed, these sorts of data could also be used in long term planning efforts.

Other Topics

The committee came to recognize that some areas previously outside the provost’s portfolio and the input of faculty and colleges should be more closely linked to the Office of the Provost. These recommendations include:

- The provost should initiate a systemic change in the assignment of classrooms.

Classroom space should be matched to faculty teaching style so that faculty who teach with technology are assigned technology-enhanced classrooms while faculty who teach in groups and teams are assigned classrooms with movable chairs.

- The provost should ensure that faculty and instructional specialists have adequate input into the renovation, construction, and planned upgrades of classrooms. Even large science classes need small discussion classrooms, and even small classrooms need technology. Specific attention should be paid to acoustics, wiring, lighting, laptop outlets, wireless capability, and ability to have flexible table and chair configurations. The provost should further insure that, when classroom space is lost, replacement space is included as part of the renovation plan.
- The provost should consider ways to facilitate efficient and appropriate processes for colleges and academic units to access student information data. Because admissions reports to the provost, it may be time for the SIS function to report to this office as well in order to ensure that faculty and colleges have adequate use of student data for enhancement of tools for teaching and advising. Such an arrangement would have greatly facilitated the development of the Advisor's Toolkit.
- The provost should convene a group to investigate the best way to align for credit courses that are developed by and offered through the Distance Education Center. Whenever possible, faculty, departments, colleges, and DIIA should be partners in these endeavors in order to avoid duplication of effort and to produce instructional resources that enhance the educational mission on campus as a whole as well as at a distance. Such efforts could also produce a core of courses that prepare non-degree students for the rigors of pursuing a degree at UT Austin.
- The provost should include ethics training for undergraduates as a part of the implementation of the honor code. It is common for TEL to use a wide variety of online resources, and it is critical that students be trained in the proper use and documentation of these materials as well as in other issues such as plagiarism and academic honesty. Course registration could be contingent upon the successful completion of this mandatory online training module.
- Given the importance of enabling faculty participation in TEL, and that the computer hardware associated with these efforts can rapidly become antiquated, it is important that the provost's office reinstitute full funding for the Faculty Computer Life-Cycle Funding Program. It is also recommended that a similar program in software support for faculty be investigated.

Appendix

List of guest speakers

Craig Champlin	Professor and Chair, Department of Communication Sciences and Disorders.
Shan Evans	Associate Director, Division of Instructional Innovation and Assessment
Frank Fisher	Research Associate, LBJ School
Chuck Gaede	Associate Director, Division of Instructional Innovation and Assessment; and Interim Director, Measurement and Evaluation Center
Jack Gilbert	Chair, Technology Enhanced Learning Committee 1999-2000; Associate Dean, College of Natural Sciences; Professor, Department of Chemistry and Biochemistry
Georgia Harper	Manager, Intellectual Property Section, Office of General Counsel, The University of Texas System
Richard Lariviere	Dean, College of Liberal Arts
Brian Roberts	Associate Dean, College of Liberal Arts
Kathy Schmidt	Director, Faculty Innovation Center, College of Engineering
Joe TenBarge	Director, College of Liberal Arts Instructional Technology Services; and Chair, University Technology Classroom Committee