

# e-Education: Integrating Technology to Support Pharmaceutical Education. Chair Report for the Academic Affairs Committee<sup>1</sup>

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According to the Bylaws of the AACP, the Academic Affairs Committee shall consider

*the intellectual, social, and personal aspects of pharmaceutical education. It is expected to identify practices, procedures, and guidelines that will aid faculties in developing*

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students to their maximum potential. It will also be concerned with curriculum analysis, development, and evaluation beginning with the preprofessional level and extending through professional graduate education. The Committee shall seek to identify issues and problems affecting the administrative and financial aspects of member institutions. The Academic Affairs Committee shall extend its attention beyond intra-institutional matters of colleges of pharmacy to include interdisciplinary concerns with the communities of higher education and especially with those elements concerned with health education.

Technology is revolutionizing the delivery of education throughout the health sciences. Computers offer the opportunity to instantly link students to the world's information resources, but access to information alone may not guarantee learning of the type and depth demanded by the ACPE Accreditation Standards and Guidelines for the Professional Program in Pharmacy Leading to the Doctor of Pharmacy Degree (1), the CAPE Educational Outcomes(2), and the outcomes established by colleges and schools. Neither can computers take the place of the personal connection between faculty and student that can enrich an education and shape a professional career(3).

In an effort to promote the appropriate use of technology in the education of campus-based and distance students to advance learning, to disseminate information and facilitate acquisition of knowledge, and to advocate contemporary learning environments and practices that allow faculty to share philosophies and instill values, President Victoria F. Roche requested that the 2000/01 AACP Academic Affairs Committee address the following:

- Identify mechanisms and strategies that could be employed by member colleges and schools to maximize the impact of technology-based courseware on the development of critical thinking and problem solving skills, knowledge integration and retention.
- Identify the professional attitudes and behaviors (such as responsibility, integrity, confidence, caring, etc.) that can be effectively inculcated through the use of technology. Suggest techniques and mechanisms for the use of technology to develop or enhance these attitudes and behaviors within the professional curriculum.
- Suggest techniques and strategies member colleges and schools might employ to garner administrative support for leadership in academic technology. How can technology leadership, once established, be used to foster changes in the academic environment that support learning and professional development?
- Advise the academy regarding the establishment of formalized AACP Teaching Learning and Technology Roundtables™.

## BACKGROUND

Rather than recreate text and information available elsewhere, the committee report provides a context and organization for selected sources available on the Internet. As in any dialog, debate, or conversation, a common language and use of terms is critical to understanding. A glossary of technical terms associated with distance education is found at <http://www.uidaho.edu/evo/dist13.html> <http://www.uidaho.edu/evo/dist13.html>. For a brief overview of distance education, including effectiveness, delivery, terminology, and stakeholders, see <http://www.uidaho.edu/evo/dist1.html>.

In an electronic communication to the Teaching, Learning, and Technology (TLT) Group entitled Why Bother? [<http://www.tltgroup.org/gilbert/WhyBother.htm>] (4), TLT Group President Steven W. Gilbert provides a list of reasons why, in spite of "the widening gap between expectations for what can be done to improve teaching and learning with information technology and the resources available to support such efforts," institutions and faculty members should commit to improving teaching and learning through the use of technology. In pharmaceutical education, the importance of a focus on technology is two-fold: (i) technology as a content focus within the curriculum because it is becoming an increasingly important tool in the provision of pharmaceutical care and management of a pharmacy practice; and

(ii) technology as an educational tool to support the teaching and learning process.

- **Technology as a Content Focus:** Gilbert(4) suggests that "essential applications," that is, applications of information technology essential for doing work, is one reason to commit effort and resources to technology. In the context of pharmaceutical education and pharmacy practice, technology is fundamental to prescription processing, patient record management, drug information, provision of patient care, and communications with health care professionals, patients, and caregivers. Use of these technology applications (*i.e.*, software, tools) is a critical skill for students to learn. Other reasons listed by Gilbert applicable to the content focus domain in pharmaceutical education include information literacy (*e.g.*, finding, selecting, and distributing drug information) and career necessity (*e.g.*, use of computers and telecommunications in the practice of pharmacy).
- **Technology as a Teaching/Learning Tool:** The remaining items from Gilbert's list that support a focus on technology as a tool for teaching and learning include new learning capabilities (*e.g.*, in pharmaceutical education, laboratory demonstrations and patient simulations once too costly or too dangerous can now be integrated into the curriculum); meeting varied learning needs, preferences, and media (*e.g.*, capability to enhance text-based information with audio/video materials); difficult or impossible access; higher expectations for student achievement based on use of productivity tools; window to the outside world (*e.g.*, access to experts in a given field not located on campus); competition (*e.g.*, "institutional ability to compete for students, faculty, and grants is dependent to some degree on the apparent level of educational use of information technology"); and better communication/better learning.

The committee members reviewed numerous Websites to develop their report. A partial list of sites is provided here for the reader's exploration.

<http://www.uidaho.edu/evo/dist2.html>  
<http://www.uidaho.edu/evo/dist3.html>  
<http://www.uidaho.edu/evo/dist8.html>  
<http://horizon.unc.edu/TS/default.asp?show=article&id=839>  
<http://www.tltgroup.org/gilbert/millis.htm>  
<http://www.ala.org/acrl/ilintro.html>  
<http://www.ala.org/acrl/ilstandardlo.html>  
<http://www.uidaho.edu/evo/dist12.html>  
<http://www.educause.edu/issues/faculty.html>

For the purposes of this report, computer-based technology is defined as a tool. The academy needs to explore how that tool can be used to support and improve learning. By focusing on student learning, the content and the outcomes we want to achieve will determine the methods we use for teaching and how students learn. This being said, to indiscriminately mandate using computer-based technology in pharmaceutical education would be irresponsible, especially if students are already learning well by other methods; however, the committee supports developing and exploring the use of computers as tools for learning and disseminating ideas and methods for instructional applications of computers that prove to be educationally and cost effective.

Faced with what became a tremendous scope of work presented by the four charges, the committee chose to focus its efforts on leadership issues and the concept of Teaching, Learning, and Technology Roundtables™. Recognizing the importance of the first two charges, however, the committee offers the following recommendation:

**Recommendation 1:** Through the focused efforts of members in the Electronic-Based Instructional Resources Special Interest Group (EBIR SIG), or a future Academic Affairs Committee, create a resource document to guide the appropriate integration of technology into the pharmacy curriculum as an instructional delivery tool for the

purpose of facilitating student achievement of specific curricular outcomes.

## **STRATEGIES TO GARNER ADMINISTRATIVE SUPPORT FOR LEADERSHIP IN ACADEMIC TECHNOLOGY**

College and university administrators can profoundly affect how educational technology is accepted and used by faculty and students. In worst-case scenarios, administrators may actively put stumbling blocks in the way of those who are searching for new approaches to improve teaching and learning or, ironically, require all faculty to use technology without considering ramifications of mandating specific technologies in diverse educational contexts. Conversely, administrators who focus on desired educational outcomes of the students and the environment in which faculty and students must function are well on the way to creating a situation where innovation that includes technology-based learning can flourish. Even though faculty and students are the end users of educational technology, administrators have a critical role in developing a vision for and implementing a plan to foster changes in the academic environment that support learning and professional development.

Standard No. 2. of the American Council on Pharmaceutical Education's Standards and Guidelines for Accreditation of Professional Degree Programs in Pharmacy(1) states that a college or school of pharmacy "should have a plan and deploy a systematic planning process to facilitate and continuously improve achievement of the College's or School's mission, goals and objectives." Any administrator who desires to enhance teaching and learning using technology should have the outcomes of that plan clearly in mind and use those expected outcomes as the basis for strategic thinking. Whether the plan proves successful may depend, in part, on administrative responses to three questions(5,6):

- Can the institution make education a priority?
- Can the institution create and share new information with its constituents?
- Can the institution provide access to resources?

### **Making Education a Priority**

Many universities proclaim the triune mission of education, research, and service to the outside world, but those of us who have struggled through the promotion and tenure process from within the halls of academia often become painfully aware that the true, unspoken, priority at many institutions places education at the end of the list and research at the top. The savvy faculty member quickly learns that research dollars and high-profile publications are the surest way to get a foothold up the tenure and promotion ladder. So, can the equally savvy administrator provide leadership that will foster change that supports learning and professional development through technology? Probably not, unless that administrator is willing and able to modify the rewards system in order to bring about a change in faculty culture that makes education a priority that is equal to research(7). Such a paradigm shift would also have to include a commitment to developing faculty as teachers and students as wise consumers of their education. Foundational to this paradigm shift is recognition of the scholarly value of technology use and development with respect to instruction and appropriate academic rewards for educational innovation. At the very least, the academy must develop a framework for documenting faculty activity and ways that enable them to succeed as educators and not fail because they are educators who choose to use technology.

Not everyone is a naturally effective teacher, but outside of a college of education, how many faculty formally learn how to become effective teachers? Administrators need to continuously make opportunities for faculty development available even if some faculty do not take advantage of them. Many opportunities to educate faculty and administrators may already exist at the campus level through a center for teaching excellence, but one should be aware of the limitations of courses that emphasize such topics as learning how to assemble a slide presentation in PowerPoint® or how to use a document scanner.

Although useful skills, training that focuses on the "how to's" of a particular software package or on "which button to press" fail to shed light on greater principles of cognition that can empower faculty to become creative educators. If faculty are given the tools to help them think in new ways about teaching and learning, not only will they be able to use existing resources more effectively, they will also be able to develop innovative tools and educational methods(8-9).

Any discussion about effective teaching must be balanced with a discussion about effective learning. The motivations and learning requirements of the student in a first professional degree program are very different from the adult learner who is already in practice and knows exactly what he or she needs or wants to learn. Not only do we need to guide professional degree students to focus on how they get an answer rather than what answer they got, we also must educate them as to what constitutes quality teaching from faculty. This may be a frightening prospect to faculty who see themselves, rather than students, as central to the educational process.

Some schools are experimenting with "standardized students" where a cadre of learners are taught how to evaluate the quality of their instructors' methods and how to give useful feedback to faculty on the quality of their teaching. Another approach to helping students learn about quality teaching is for students to formally learn how to become teachers themselves. By providing students with knowledge of teaching methods and opportunities to practice that knowledge, we would be making an investment in pharmacy faculty of the future. If colleges and schools of pharmacy were to develop an education track that runs parallel to clinical and research tracks, the profession of pharmacy would have the means to begin addressing faculty shortages and would be taking a truly innovative step among the academic disciplines.

### **Creating and Sharing New Information**

Faculty and student development are specific ways to address the general need for information sharing among participants using educational technology. Similarly, administrators must make the effort to educate themselves and surround themselves with knowledgeable people in order to make better decisions. A wealth of information already exists on technologies and educational techniques that can be successfully applied or adapted to pharmaceutical education, but where does one find it and how does one share it?

Educators need to locate reliable sources of information and engage in a dialog about using technology to enhance teaching and learning. As we gather and apply data, we need to research the effectiveness of what we apply in our teaching in order to add to our overall understanding of teaching and learning. Efforts must be made to seek out faculty and institutions that have developed educational technology resources and share that information through clearinghouses or directories. There is little point to reinventing information, so when usable directories already exist, educators should be encouraged to use and contribute to them. One such multimedia educational resource directory for on-line teaching called "Merlot" (<http://www.merlot.org>) claims to house nearly 4000 learning objects from a variety of disciplines.

Faculty and administrators can benefit from a steady stream of information in jargon-free language about what is going on in technology so that classroom and policy decisions can be made from an informed position. Educators need to discuss what they are doing with technology, not just on a single campus but also across all pharmacy campuses (see discussion of Teaching, Learning, and Technology Roundtables™ below). E-mail listserves are a common method for disseminating information and can be used to discuss general theories in education and educational technology or to discuss the availability of technologies, the value of individual courseware packages, and the proper methods for implementing technology-based instruction.

Pharmacy educators would also benefit from the intellectual cross-fertilization that occurs from joining larger organizations beyond the pharmacy community and even completely outside of the healthcare arena. Organizations such as EDUCAUSE (<http://www.educause.edu>) bring together faculty members from all disciplines who share a common interest in educational technology.

Administrators should encourage faculty to become active in educational organizations and make it possible for them to attend conferences through travel support.

Interdisciplinary information sharing can also be accomplished on a campus level through brown-bag discussions, technology fairs, and faculty-and student-project showcases. On-campus grants have also been used as an incentive to stimulate faculty to consider creative ways to use technology in their teaching. Using technology in teaching does not necessarily mean that instructors are expected to program courseware (educational software), however, we should encourage pharmacy faculty to contribute their professional expertise to the development of courseware, especially in areas that are not traditionally taught in the classroom either because of insufficient resources, health and safety issues, or a shortage of expertise. Again, this contribution and research on the effectiveness of technology-based learning should be recognized as scholarship in the promotion and tenure process(7).

Currently, if technology appears to overcome the shortcomings currently faced in the classroom, it is assumed that it works. However, as faculty integrate technology-based learning into the classroom, criteria or indicators are needed that will measure learning outcomes facilitated by technology. Specifically, research is needed on the impact of technology on student outcomes to better understand whether technology enhances student learning, whether technology enables things that we were unable to do before, or simply whether technology is cost effective compared to other instructional delivery methods. Reliable methods for measuring the effectiveness of technology-based learning must be identified from the educational literature and developed as needed. For the purpose of discussion and building foundational knowledge in all disciplines, the outcomes research that grows from using technology in pharmaceutical education needs to be shared with the broader audience of educators and not limited to pharmacy(10).

#### Providing Access to Resources

The creation of new and innovative teaching methods that involve technology is often hampered by resource limitations that prevent the most well-intended faculty member from creating any more than just a few hours of course instruction in digital format. To be maximally effective in fostering the introduction of technology within the typical curriculum, the administration must create a reward system that acknowledges the faculty members' contribution to the mission of the institution. On a more pragmatic level, the administration must secure the resources necessary to foster the creation of high quality instructional materials and an infrastructure that supports its use. This may include the creation of faculty positions for instructional developers, staff positions for graphic artists and Web masters, and an atmosphere that fosters technological innovation. Commitment without resources is insufficient to foster change. In some cases, the academic leader(s) must actively seek alternative revenue streams through the active re-purposing of instructional content. Many colleges and universities are discovering that the high development costs associated with instructional technology must be allocated over as many different markets as possible to maximize the quality of instructional content while minimizing the individual unit costs. In some cases, this may take the form of cooperative ventures with other campus units or universities or, perhaps the creation of for-profit entities, that can rapidly respond to educational opportunities in the private sector. Administrators must also make a personal commitment to become better informed about emerging technology trends, changing accreditation standards, and way to better prepare faculty, staff, and students to efficiently and effectively use technology.

Barriers to electronic information access will soon become a limit to learning; consequently all colleges and schools will need some fundamental technological infrastructure. The administrator must also be aware of students who are not able to afford a computer and may need to ensure that they have a mechanism for getting access to the information that they need. When one compares the difficulties involved in changing attitudes to bring about a revolution in how we

think about education, then acquiring resources seems relatively easy; but getting adequate funding to build an on-line curriculum may also prove to be a challenge that requires changing attitudes and convincing others that an investment in a novel educational approach is worthwhile.

Budgeting for technical infrastructure must include short term, reoccurring and replacement costs, as well as funds to pay the individuals responsible for maintenance and instruction of others on how to use the equipment. In addition to needing access to the hardware and software, faculty will also need access to media such as images, video clips, and sounds that they can integrate into their teaching. Knowledge of copyright and fair use laws is important, thus, the administrator needs to facilitate information about using copyrighted material through in-services and provide ways of providing copyright clearance that is seamless to the faculty, such as through a copyright center in the library.

#### TEACHING LEARNING AND TECHNOLOGY ROUNDTABLES (TLTR™)

Teaching, Learning, and Technology Roundtables (TLTR™) are a program of the Teaching, Learning, and Technology (TLT) Group. Functioning on a local basis (*i.e.*, institution specific), "a Teaching, Learning, and Technology Roundtable is a uniquely diverse group representing all those who can and should work together to improve teaching and learning with information technology"(11) <http://www.tltgroup.org/programs/round.html>]. Because a TLTR™ functions locally to advise institutional leaders on steps to improve education through the effective use of technology given local resources and mission, an Association-based TLTR™ would be inappropriate. However, the Committee strongly encourages member institutions participate in their own campus TLTRs™ or support the establishment of one if one does not yet exist. See <http://www.tlt-group.org/programs/rpartins.html> for a list of the over 400 colleges and universities that have launched TLTRs™.

Guidelines to assist in the formation of a local TLTR™ are available at <http://tltgrouporg.readyhosting.com/resources/rltguide.html> and a series of fundamental questions for consideration by the TLTR™ once established to provide a basis for on-going discussion are available at <http://tltgrouporg.readyhosting.com/resources/rfundamental.html>. The six recommended characteristics of a TLTR™ (12) are:

- **Two Categories of Faculty Represented:** users and non-users of information technology in their teaching;
- **Four+ Services/Organizations Represented:** minimum of four key service/support organizations (*e.g.*, library, computing, bookstore, teaching/learning center, faculty development, student affairs, facilities management) within the institution;
- **Chief Academic Officer Engaged;**
- **Student Views Available:** possibly through student representatives on/participation in the TLTR™;
- **Inter-Institutional Informational Exchange and TLTR Coordinator:** a coordinator to communicate on behalf of the institution with the TLT Group and with other TLTRs™;
- **Long-term Institutional Commitment:** anticipated lifespan for a TLTR™ is several years.

A case study from Duquesne University is available on the TLT Group Web site with the following components:

- The text of the charge given to the Duquesne University Educational Technology Committee by Provost Michael P. Weber: <http://tltgrouporg.readyhosting.com/resources/rduqcharge.html>;
- Promotion and tenure criteria to recognize use of educational technology: <http://tltgrouporg.readyhosting.com/resources/rduqten.html>; and
- A PowerPoint presentation on the structure and function of the Duquesne TLTR™: <http://tltgrouporg.readyhosting.com/>

## Flashlight™ and Virtual Teaching, Learning, and Technology Centers [(V)TLTCs™]

Two additional programs are available through the TLT Group that may be of interest and benefit to AACP member institutions: the Flashlight™ program and Virtual Teaching, Learning, and Technology Centers [(V)TLTCs™]. Flashlight™ offers products and consulting services to help educators and their institutions study and improve educational uses of technology. Tools and assistance in designing evaluation procedures have application in institutional program assessment activities, accreditation self study, and program quality improvement activities. Detailed information about Flashlight™ is provided at the following sites:

- <http://tltgroup.org.readyhosting.com/programs/flashlight.html>
- [http://tltgroup.org.readyhosting.com/programs/FL-study\\_topics.html](http://tltgroup.org.readyhosting.com/programs/FL-study_topics.html); and
- <http://www.tltgroup.org/programs/ffaqs.html>.

Virtual Teaching, Learning, and Technology Centers [(V)TLTCs™] offer services and materials to help faculty members and academic support professionals keep up with the changing options available for improving teaching and learning with technology and with changing needs, capabilities, and goals of learners and teachers...Local (V)TLTCs focus on improving teaching and learning with information technology. They provide training and consultation services and related materials for faculty members (and, possibly for staff, administrators, and other support professionals)<sup>(13)</sup>. A “starter-kit” of materials to begin the process of starting a local (V)TLTC™ and accessing resources available from the TLT Group may be accessed at [http://www.tltgroup.org/resources/StarterKit\\_TLTC2-24-00swg.htm](http://www.tltgroup.org/resources/StarterKit_TLTC2-24-00swg.htm).

The TLT Group encourages the development of inter-institutional (V)TLTCs™ to support the work of local (V)TLTCs™ and stay current with the growing body of knowledge and resources related to the educational uses of technology. Included in the AACP Strategic Plan (adopted July 2000), are the following two goals (with supporting strategies):

### Goal V: Colleges and schools will have professional degree curricula and life-long learning opportunities that prepare students to practice successfully throughout their pharmacy careers.

- AACP will provide education and training on pedagogy and andragogy to faculty members.
- AACP will stimulate and disseminate educational innovations that are applicable to pharmaceutical education.
- AACP will provide forums for faculty to discuss and debate curricular content issues.

### Goal IX: AACP and its member colleges and schools will be proficient in the use of information technology to facilitate achievement of their individual goals.

- AACP will develop optimal strategies to employ information technology to improve communications between AACP and its members and to facilitate communications among AACP institutional and individual members.

Consistent with these goals and strategies, the committee offers the following recommendation:

**Recommendation 2:** AACP should form an inter-institutional Virtual Teaching, Learning, and Technology Center [(V)TLTC™] to support the local, institution-specific activities [TLTRs™, (V)TLTCs™] of member institutions, coordinated through the Electronic-Based Instructional Resources Special Interest Group (EBIR SIG). Opportunities for participants to interact should be provided at each annual meeting as a recurring special session planned by the EBIR SIG.

## CONCLUSION

If an institution is focused on a high-quality education, then technology may be one of the tools to accomplish that. Academic administrators are in a position to make the bold statement that they value student learning as highly as they do research and professional service. Colleges and schools of pharmacy must make an honest, organizational commitment to enhance teaching and learning by whatever means necessary, be they incentives for teaching excellence and peer recognition, professional instructional development, or technology.

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