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MEETING THE CHALLENGE:

ACHIEVING INFORMATION TECHNOLOGY FLUENCY AT THE UNIVERSITY OF MEMPHIS

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INTRODUCTION

Reflecting on the rapidly changing nature of Information Technology (IT), Dr. James Penrod, Vice President for Information Systems and CIO at the University of Memphis, recently wrote:

> IT is different than it used to be! Those who support IT and those who use IT need to think differently about the technology. PCs changed the IT landscape in the 80's and networks, servers, browsers and portals are changing it yet again, and again, and . . . again (*Technology*, Fall 2001, p. 1)

Students, faculty, and staff at the University of Memphis are part of this change. Consider a few facts from this University:

- Internet1 traffic increased 117% during the last year (to 26 million megabytes) and Internet2 development is well underway;
- Four additional TigerLAN labs have been introduced since FY2000, bringing the total number of such labs to 69;
- Five (5) new "smart" lecture/classrooms were added during the last year, bringing the total to 31; these classrooms enhance the capacity of instructors to utilize IT in the classroom;
- An increasing number of courses are incorporating various components of IT to enhance student learning, including computer and web-based instruction, on-line applications, video conferencing, and other techniques. For example, during Fall 2001, there were

roughly 300 active courses in our "course management systems" that were either exclusively on-line or used substantial on-line components; more than 2,000 students were enrolled in these courses;

- One hundred thirty nine (139) new high-end computers were recently installed in the Smith Super Lab and the McWherter Library lab;

- The University of Memphis will host a major conference in March 2002 ("Global Cities: Promise and Peril") that focuses, in part, on "Information Technology in the Global City;"

- An increasing number of collaborative research projects, across disciplines, are using IT to uncover significant findings;
- Several innovative research and teaching projects are studying the effect of IT on globalization and on economic development and health in the developing world.

Expanding on the last two points, it is clear that IT is a powerful tool that can enhance research, broaden collaboration, and develop (and pool) a wide array of resources. This point was elegantly stated in the University of Michigan's "President's Information Revolution Commission Report":

> Research and scholarship are increasingly interdisciplinary, collaborative efforts. The Internet and new information and communication technologies are enhancing – and transforming – research and scholarship, enabling users scattered throughout the world to share facilities, instruments, immense collections of multimedia information and tools for analysis and synthesis. These technology-mediated environments, often called *collaboratories* or *knowledge networks*, not only allow scholars and scientists to work together more effectively, across distance and discipline, but also offer whole new approaches to investigating and analyzing concepts and phenomena (*Executive Summary*, p. 2 [2001]).

Despite the promise of IT, the University of Memphis and other universities often fail to reach their potential in this area because many faculty and students are not "fluent" in IT (see below for definitions). In fact, students and faculty have a wide range of abilities with respect to facility with IT. A small group *is* "fluent," a larger group is "literate" and can apply IT in certain situations, and a small group has little knowledge of IT or how to use it at all. Although we do not have precise data on what proportion of students and faculty fall into each category (and we could establish additional categories as well), we must remain cognizant of the different levels of expertise exhibited by faculty and students when making recommendations.

The purpose of this Task Force – the University of Memphis Information Technology Fluency

Task Force – is to recommend a comprehensive strategy that will facilitate IT fluency for students and faculty. (A separate committee is focusing on "staff fluency.") It is imperative that students and faculty are not merely "IT literate," but, in fact, that they are "IT fluent." This Task Force has met for several months and is making its recommendations directly to Dr. Ralph Faudree, Provost of the University, and Dr. James Penrod, Vice President for Information Systems and CIO.

It should be noted at the outset that our recommendations about how to promote fluency among students are directed primarily at **undergraduate** students. Although we believe that graduate students should achieve IT fluency, we defer to their specific graduate programs in terms of recommending how to develop fluency in a way that complements their course of study.

In addition to the efforts of universities and colleges to facilitate IT fluency, the federal government and businesses are also pushing new initiatives. In 2001, the President's Information Technology Advisory Committee submitted a report to President Bush titled "Using Information Technology to Transform the Way We Learn." It stated:

> The overarching recommendation is that the Federal government set as a national priority the effective integration of information technology with education and training . . . [including the development of] **requirements for learning and teaching information technology fluency.** (Introductory letter to *Using Information Technology to Transform the Way We Learn*, pp. 1-2 [emphasis added]; to examine the website for the National Coordination Office for Information Technology Research & Development, see www.itrd.gov)

DEFINING "FLUENCY WITH INFORMATION TECHNOLOGY" (FIT)

In 1997, the Computer Science and Telecommunications Board of the National Research Council (NRC) initiated a study of "information technology literacy." It appointed a "Committee on Information Technology Literacy" that worked on this topic for two years and ultimately published its findings in the form of a widely used and cited book: *Being Fluent with Information Technology* (National Academy Press, 1999).

The Committee's basic premise is that simple "computer literacy" is not sufficient in today's rapidly changing world:

> [The] requirement of a deeper understanding than is implied by the rudimentary term 'computer literacy' motivated the committee to adopt 'fluency' as a term connoting a higher level of competency. People fluent with information technology (FIT persons) are able to express themselves creatively, to reformulate knowledge, and to synthesize new information. Fluency with information technology (i.e., what this report calls FITness)

> entails a process of lifelong learning in which individuals continually apply what they know to adapt to change and acquire more knowledge to be more effective at applying information technology to their work and personal lives (*Being Fluent with Information Technology*, p. 2).

Fluency was defined as having "three kinds of knowledge: contemporary skills, foundational concepts, and intellectual capabilities" (p. 2). The U of M IT Fluency Task Force endorses this approach and further comments on the three areas below.

Contemporary skills

This refers to the basic skills required of a FIT person. Such a person would have the ability to utilize hardware and software to process information. The U of M IT Fluency Task Force concludes that FITness requires mastery of the following skills, some of which are mentioned (in one form or another) in the book *Being Fluent with Information Technology* (especially pp. 2-5). A FIT person (whether student or faculty member) can:

- Set up a personal computer;
- Use the Internet to locate information;
- Word process efficiently;
- Access electronic data bases;
- Install software;
- Install and maintain virus protection;
- Use technology to prepare presentations (e.g., PowerPoint);
- Understand and use courseware;
- Use email (including the ability to set-up "client");
- Understand the interoperability of common programs;
- Understand basic computer and Internet security;
- Connect to the Internet (including dial up; Lan/ISP/Passwords/Proxies);
- Understand and use Windows/Mac-OS, including the ability to open programs and documents, use help systems, shut down the system, copy files, and use basic utilities;
- Utilize "web for faculty" (University of Memphis faculty);
- Utilize "web for students" (University of Memphis students);
- Navigate information structures.

Foundational Concepts

The NRC's Committee on Information Technology Literacy stated: "Foundational concepts, the basic principles and ideas of computers, networks, and information, underpin technology. Concepts explain the how and why of information technology, and they give insight into its

opportunities and limitations" (*Being Fluent with Information Technology*, p. 3). FIT individuals understand current technologies and possess the ability to understand and manage changing technologies as they emerge.

The U of M IT Fluency Task Force concludes that FITness requires mastery of the following concepts, some of which are mentioned (in one form or another) in *Being Fluent with Information Technology* (especially pp. 2-5). A FIT person understands:

- Computers, information systems, and networks;
- Creation and dissemination of information, including information in digital form;
- Modeling and abstraction as it applies to IT;
- Impact of IT on global society;
- History of how IT has affected society;
- Convergence and universality of IT;
- Limitations of IT;
- Ethical issues surrounding IT;
- Legal issues related to the growth in IT.

Intellectual Capabilities

The NRC's Committee on Information Technology Literacy stated: "The intellectual capabilities of FITness refer to one's ability to apply information technology in complex and sustained situations and to understand the consequences of doing so. These capabilities transcend particular hardware and software applications" (*Being Fluent with Information Technology*, p. 17). In many ways, intellectual capabilities are the most important feature related to fluency in information technology and, at the same time, they are the least related to "only" information technology. The intellectual capabilities mentioned below are **critical skills** and should be stressed in many different applications across disciplines, regardless of their specific relationship to IT.

The U of M IT Fluency Task Force concludes that FITness requires mastery of the following intellectual capabilities, most of which are mentioned (in one form or another) *in Being Fluent with Information Technology* (especially pp. 2-5). A FIT individual has the following intellectual capabilities, to:

- Engage in sustained reasoning;
- Organize and evaluate various types of information;
- Manage complexity and change in a rapidly changing environment;
- Think about IT abstractly;
- Understand algorithmic thinking as utilized in IT;

- Collaborate across disciplines and geographic locations;
- Communicate to audiences outside of IT specialists;
- Test outcomes and solutions.

MECHANISMS TO ACHIEVE STUDENT FITness

Although the skills, foundational concepts, and intellectual capabilities are largely the same for students and faculty, the **mechanisms** to achieve these aspects of FITness vary according to whether the individual is a student or a faculty member. Below, we examine mechanisms first for students, and then for faculty.

Across-the-Curriculum Approach

It is very clear that student FITness will be achieved only with a university-wide, across- the-curriculum approach. The University of Michigan's "President's Information Revolution Commission Report" stated:

> A university-wide, across-the-curriculum approach is needed, providing faculty with the support they need and offering all students opportunities to use the state-of-the-art technology in education-enhancing ways while at the same time learning to think critically about the implications of the information revolution for the discipline they are studying as well as for the larger world. In our 'ecology of experiments,' we must continually share what we learn from these efforts across the curriculum, and build upon the best practices that emerge (*Executive Summary*, p. 3).

A similar conclusion was reached by Calvin College, a small liberal arts institution in Grand Rapids, Michigan. Calvin recently issued a report titled "Building Information Technology Fluency into a Liberal Arts Core." The committee studying this issue concluded that the College needs a core information technology course as a start, followed by additional courses throughout the students' careers:

> Our proposal centers on developing an innovative information technology course as a strategic part of a liberal arts curriculum to be taken by all first year students. It will form a 'hub' with 'spokes' that fan out through other core courses that address technology explicitly, courses that use information technology as part of the educational process, and courses in the disciplinary majors. Thus, a small foundational course taken early in the college career is a stepping stone for further learning about information technology in a practical setting *("Building Information Technology Fluency into a Liberal Arts Core," Calvin College*, p. 1).

The U of M IT Fluency Task Force strongly endorses an "across- the-curriculum" approach. More specifically, **we recommend that University of Memphis students complete an Information Technology Fluency course (comprised of three parts – see below) early in their careers, followed by at least one upper-level substantive course later in their careers**. We discuss these two aspects below.

A Basic FITness Course in Three Modules

In order to fulfill their "Computer Literacy" requirements, about 50% of current University of Memphis students complete COMP 1200, a course designed to enhance computer literacy. Although this course teaches some of the "contemporary skills" required for IT fluency, it does not cover the other aspects of IT fluency in sufficient detail. This is not a criticism of COMP 1200. It is simply recognition that IT fluency is more than simple computer literacy or computer competency.

A good model for the University of Memphis is provided by the University of Washington (Seattle), which pioneered a course in "Fluency with Information Technology" in 1999. Today, it is jointly offered by the Department of Computer Science and Engineering (CSE) and the Information School (INFO). The course description is as follows:

> CSE100/INFO100 is an introductory class that implements the recommendations of the National Research Council's study Being Fluent with Information Technology [National Academy Press, 1999]. The report describes the knowledge and experience a person should possess to be fluent in information technology, where fluency is a more ambitious goal than computer literacy.
>
> **Literacy vs. Fluency**. Computer literacy has traditionally meant proficiency with a few contemporary computer applications such as email, word processing and the like. Though such literacy instruction enables students to use computers directly, it does not have the staying power to accommodate the rapid changes in Information Technology.
>
> To use computers effectively over time, people must become lifelong learners, continually expanding their knowledge and upgrading their skills. The NRC report adopts the term "fluency" for this more fundamental understanding of IT. The term connotes the ability to synthesize, to express oneself creatively, and to manipulate the medium to achieve ones' goals. (For more information on this course, including "The Fluency Vision," "Syllabus," "Lectures," "Readings," and other materials, please see www.cs.washington.edu/100)

The course – advertised as: "This may be the coolest class you ever take at UW" – is specifically designed to teach the contemporary skills, foundational concepts, and intellectual

capabilities that comprise overall IT fluency. Students cover a large amount of material in this no-nonsense course that meets every day of the week (three lectures and two lab sessions) during the quarter. The course entails readings, computer lab assignments, four computer projects (the heart of the course), four quizzes, and a final examination. As noted by the syllabus, this is no course for slackers: "You may turn in one project 1-day late without penalty. No other late projects will be accepted. To use this late policy, you must notify your TA in advance by email."

The U of M IT Fluency Task Force recommends that the University of Memphis' "Computer Literacy" requirement be changed to a "Computer and Information Technology Fluency" requirement. "Computer Literacy" is dated and constitutes only one component of IT Fluency. As part of a new requirement, U of M students would complete a core IT Fluency course with three modules: "contemporary skills," "intellectual capabilities," and "foundational concepts." The course might be titled "Computer and IT Fluency." We further recommend that students be allowed to satisfy this requirement with other courses from various colleges and schools of the University only if it is clear that the courses are at least as rigorous and comprehensive as the proposed course.

A new "Computer and IT Fluency" course could be organized in one of two ways:

- Following the University of Washington model, it could be a **single course** that covers the three main areas of IT fluency. It might be an **extensively revised** version of COMP 1200 or, again, along the lines of the University of Washington model, it could be a collaborative course between two (or more) units interested in computer and information fluency. For instance, as part of the University of Memphis' emphasis on interdisciplinary work, the University might consider soliciting proposals for an interdisciplinary course that teaches computer and IT fluency. The "winning" units might receive additional resources to help develop the course (see more below) and they could share the credit hours generated through the course.

- A more flexible approach would be to recognize **formally** the three modules covered by a new Computer and IT Fluency course. Under this organization, **each module** would last for approximately five weeks during the semester and would be worth one credit hour (total of 3 credit hours for completing all modules). Prior to the course, students would be allowed to "test out" of any module, but they could take the test only once for each module. In practical terms, although a small number of students may be able to pass out of the "skills" module, it is less likely that they could pass out of the other modules, which would involve "higher level" skills such as reasoning, interpretation of data, managing change, etc.

The "down sides" to this organization are that it may be difficult to (a) maintain course

continuity if students are coming and going during the semester and (b) separate the course neatly into three self-contained units. For example, some concepts and intellectual capabilities would ordinarily be introduced during the skills component of the course.

Regardless of the approach adopted for a new course, there are several important considerations upon which to focus, including the need to:

- Decide where to "house" the Computer and IT Fluency course. Again, as noted above, we suggest that an interdisciplinary approach be given careful consideration. A key would be to insure that the fluency components are taught in classrooms with sufficient IT to serve the needs of the course;

- Offer the Computer and IT Fluency course on-line, assuming it becomes a requirement for all University of Memphis students. Departments or other units that offer this course must therefore demonstrate the capacity to develop on-line courses. Resources for such development should be offered as part of the package to design and execute the course (see below). Although the U of M IT Fluency Task Force discussed whether IT fluency courses should be offered exclusively on-line, it eventually concluded that a "conventional" course setting has substantial merit for many students. Of course, any Computer and IT Fluency course will entail a substantial amount of on-line work.

- Understand that students possess different levels of IT knowledge and, therefore, the University of Memphis should maintain a flexible approach in allowing students to earn credit for the Computer and IT Fluency course. Under course organization #1 above (i.e., single course with three parts), students should be allowed to "test out" of the entire course. Under course organization #2 (i.e., single course with three well-defined modules), students should be given the opportunity to "test out" of any module that they feel they have mastered. **Also, colleges and schools within the University could establish their own Computer and IT Fluency requirements, but, as noted earlier, they must be at least as rigorous as those proposed for the larger University. Indeed, some colleges within the University already have outstanding "fluency courses," and we commend faculty members and administrators for being "ahead of the curve" in this regard. Our objective is to facilitate greater fluency throughout the campus, particularly in those fields that lag behind in terms of developing IT-related courses and resources.**

- As we know, the University of Memphis has a large number of transfer students who have completed various "computer literacy" and additional IT-related courses at other colleges and universities. Currently, the "Computer Literacy" requirements of the U of M can be fulfilled "by satisfying the Computer Literacy Competency requirements at another TBR

institution." Although this issue has political implications, we recommend that (1) computer and IT fluency courses completed outside of the U of M be given close scrutiny before students are given credit, or (2) transfer students be required to take a test related to one or more modules of the core Computer and IT Fluency course;

- Encourage students to take the Computer and Information Fluency course as early as possible in their University of Memphis careers. One concrete incentive to do so would be to offer an extended summer orientation session for new students and other interested parties. Over the course of perhaps a week, the University of Memphis could offer a "boot camp orientation" designed to develop the "contemporary skills" required for IT fluency. New students completing the course would stand a very good chance of testing out of one module of the Computer and IT Fluency course (assuming course organization #2 is adopted). Beyond giving new students a "jump start" in improving their FITness, this orientation program could involve faculty, staff, and even members of the community who wish to improve their level of IT fluency. The University of Memphis might well establish several partnerships with community businesses or other organizations that would enable their work forces to join these orientation sessions. This could bring additional resources to the University of Memphis and help establish our institution as a community (or even regional or national) leader in educating students, faculty, and others regarding the importance of IT fluency. The new FedEx Technology Institute could play a pivotal role in this type of arrangement.

Upper-Level FITness Courses

Following our across-the-curriculum approach to FITness, we also recommend that University of Memphis students complete at least one upper-level "FITness course" in their major. This could again be part of a new "Computer and IT Fluency" requirement of the University. Departments throughout the University of Memphis would be asked to develop upper-level courses that incorporate the contemporary skills, foundational concepts, and intellectual capabilities required for FITness. A committee would review these courses to insure that they are, in fact, "fluent courses." These could be entirely new courses or, more likely at least in the short run, they could be current courses "upgraded" to fluent status. For instance, the Department of Sociology requires all of its students to complete a Senior Thesis course before they graduate. Recently, the course has developed into a FITness course. Students use a new CD-ROM developed by the Department of Sociology that teaches students how to (1) understand and use data analysis programs related to the social sciences ("contemporary skills"), (2) model, create, and disseminate information generated through data analysis ("foundational concepts"), and (3) organize, explain, and communicate complex findings ("intellectual capabilities").

This upper-level FITness requirement would not add additional hours to a student's

undergraduate career because it could be satisfied by completing courses that count toward the major.

Departmental capacity to develop FITness courses varies widely depending on the level of FITness among departmental faculty. Some departments already have courses that would qualify as FITness courses, and other departments have faculty who could "upgrade" current courses without much difficulty and, if they had additional time and resources, develop innovative new courses. **This raises an important point: IT fluency among students and faculty can only be achieved if academic departments make it a priority. The administration can "mandate" a new emphasis on computer and IT fluency, but it will only be successful if academic departments embrace it and develop it**.

Departments will need incentives to offer more upper-level courses that teach FITness, including:

- Additional resources should be allocated to departmental faculty who are willing to (a) upgrade existing courses to fluent status, (b) create exciting new courses that utilize IT, and (c) develop interdisciplinary courses that incorporate FIT principles. An example of an interesting interdisciplinary course is offered by the University of Washington's Center for Internet Studies – "Introduction to Global Internet Political Economy" (www.Washington.edu/courses/winter02/sis410)

- Administrative encouragement of departmental chairs to support faculty who wish to create IT-related courses (or to upgrade current courses to include IT). For example, chairs could give a course reduction to these faculty members, and/or they could reward them in annual evaluations and possibly in tenure and promotion evaluations (if the University will reward them in tenure and promotion evaluations);

- The necessity of attracting and graduating majors who are looking for courses in Computer and IT Fluency.

In addition to offering "conventional" FITness courses, departments should remain flexible in terms of defining how students can satisfy our proposed requirement that they complete at least one upper-level FITness course. For example, an honors project, a faculty-sponsored research project, or some other course of study that entails extensive use of IT might well satisfy this requirement.

Time Table for Implementing the New Curriculum

We recommend that the University of Memphis move forward as quickly as possible to infuse IT fluency throughout its curriculum. The top priority, in our view, is to establish the basic Computer and IT Fluency course, including how it will fit into a new "Computer and IT Fluency"

requirement. We suggest that this course be in operation by Fall Semester, 2003. The remainder of the curriculum changes (i.e., the introduction of upper-level FIT courses) should be introduced by the following semester (Spring Semester, 2004).

Costs Associated with Implementing the New Curriculum

The primary costs would entail compensating faculty for developing a new Computer and IT Fluency course (including its on-line components) and for upgrading current upper-level courses to "fluent status" or creating entirely new FITness courses. Because the top priority is the creation of a new core course (or, at minimum, an extensively revised COMP 1200), we suggest that adequate resources be directed to faculty who are interested in developing such a course. Resources for upper-level FITness courses should follow the development of the core Computer and IT Fluency course.

In addition to the costs associated with course development, another cost could involve an expanded summer orientation session for new students. If a "boot camp" orientation is pursued, then we will need additional resources to compensate instructors and lab personnel, as well as to develop and print materials. Of course, some of these expenses could be defrayed if the orientations were expanded to include partnerships with community groups and businesses. Outside groups would be expected to make a contribution to the partnership, for example, paying tuition for their participants, providing an instructor, etc.

New orientation programs and new courses for the regular U of M curriculum are going to require more "smart classrooms" and computer labs. The U of M has made excellent progress in these areas in recent years, and such development must continue as greater emphasis is placed on faculty and student FITness.

Beyond "Basic FITness:" Intermediate and Advanced Fluency

Thus far our comments have been directed toward the achievement of "basic fitness," that is, the completion of a core FITness course and an upper-division FITness course. However, it is also important to think about higher levels of fluency, what we might term "intermediate" or "advanced" FITness. There are several ways to accomplish more advanced levels of IT fluency. Students could:

- Complete the basic FITness sequence and one or more additional FITness courses at the upper level. Departments should strongly encourage students to go beyond the minimum FITness requirements of the University by offering a variety of interesting and useful fluency courses each year;

- Complete honors projects, internships, or other courses of study (e.g., a Senior Thesis) that utilize IT in a substantial and meaningful way. These options would likely entail faculty mentors working with students on relevant IT projects. Again, departments need to provide an environment that facilitates such opportunities for students.

- Complete a project in the FedEx Technology Institute. The Institute might provide students who have completed the basic FITness sequence with opportunities to become involved in projects of interest to both the student and the Institute. Satisfactory completion of a project under the guidance of a mentor or project leader might result in a "FITness Certificate." At the same time, departments that offer a variety of FITness courses and other IT opportunities (e.g., honors projects) could also offer some type of "FITness Certificate" that is grounded in the discipline.

Intermediate and advanced levels of IT fluency can be accomplished through a variety of avenues. Departments are, again, crucial in this regard. They can offer courses and other opportunities for students to become increasingly fluent with IT while learning more about their disciplines. Departments can also determine what constitutes "intermediate" and "advanced" FITness within the confines of their discipline.

At the same time it is important to have a campus-wide unit, such as the FedEx Technology Institute, that can provide additional opportunities for students to achieve higher levels of FITness. Any number of scenarios could develop. Students might work on projects that combine their major course of study with a topic of interest to the Institute; or they might work on a project independent of their major course of study; or they might work to obtain a FedEx Technology Institute "FITness Certificate" after they have obtained a similar certificate from their department, etc.

The FedEx Institute can play an important role for students majoring in departments that have a variety of FITness opportunities as well as for students majoring in departments that do not. The former group will seek out new challenges and opportunities provided by the Institute, whereas the latter will **need** a place to begin pursuing topics that require higher levels of IT fluency.

Breadth and Depth in the Curriculum

Acceptance of our recommendations would insure a revised curriculum that would offer two things to each undergraduate student. First, students would have broad, across-the-curriculum opportunities to develop basic FITness. A core FITness course, combined with at least one upper-level course in the student's discipline, would provide her or him with a basic level of IT fluency. Second, students would have more and more opportunities to develop an in-depth knowledge of IT and how it operates in the world today. As faculty members develop greater IT

fluency (see next section) and departments stress the importance of FITness, an increasing number of courses using IT will be incorporated into the curriculum. Moreover, students will have more opportunities to learn about the utility of IT through the completion of faculty-guided class projects, research projects, and community-oriented projects. We believe that all students should be **required** to achieve a basic level of FITness and they should be **encouraged** to develop higher levels of IT fluency.

MECHANISMS TO ACHIEVE FACULTY FITNESS

Overall, faculty FITness is more challenging to achieve than student FITness, primarily because it is more difficult to "require" participation by faculty in various training courses and programs. The U of M IT Fluency Task Force strongly prefers to use more "carrots" than "sticks" to facilitate faculty FITness. We want to encourage faculty FITness by providing faculty members with a variety of avenues for achieving this objective. **We also recognize that it will be difficult to attain student FITness without faculty FITness**.

We have the following recommendations for achieving faculty FITness:

- Create an inventory of available IT resources for faculty members and develop a plan to pool these resources together in a central location. This central pool would serve as a "one-stop shop" for faculty members to use as they work to enhance their levels of fluency. Either the library, or the new FedEx Technology Institute building, would be good candidates for this resource center. The resources would provide information relevant to becoming fluent in IT skills, concepts, and intellectual capabilities. Ideally, these resources would also include on-line "courses" or tutorials that would enable faculty to work through material on their own. Easy access to the material used for a new Computer and IT Fluency course for students would also assist faculty in becoming more IT fluent;

- Develop additional training courses and workshops for faculty to enhance IT fluency. These could be "short courses" designed to cover the skills, concepts, and intellectual capabilities related to IT. In order to pool resources and form partnerships with the community, the short courses could be collaborative efforts among the University of Memphis, community computer organizations, and businesses (including Dell);

- Although these **general** courses have obvious value, the best training programs would probably take place at the **departmental** level. Moreover, similar departments (or programs across departments) could collaborate to examine those elements of IT most relevant to their research and teaching needs. We appreciate the fact that faculty are busy and are going to concentrate on workshops that are directly relevant to their research and teaching. Departments that express an interest in faculty FITness by developing relevant

courses, workshops, colloquia, brown bags, and other resources will likely have a relatively FIT faculty;

- Develop innovative programs such as one at the University of Virginia, where FIT graduate-student computer lab assistants are utilized as local “on site” consultants for departmental faculty working on IT-related issues. This arrangement places faculty members in close proximity to experts who are enthusiastic about providing assistance. Graduate students gain valuable experience and also benefit from the monetary support offered through this form of assistantship;

- Give strong consideration to awarding faculty some credit towards tenure and promotion for developing IT-related courses or other resources. Young faculty members are under substantial pressure to publish articles and books, and to publish quickly. At the same time, these faculty members generally have the most interest in and best training to develop IT-related courses and materials. If the University would give faculty some credit for this development in lieu of an article or two, it would reassure faculty that they will be rewarded for taking the time to develop courses and materials related to FITness. But this must be a University-wide decision; departments and even colleges cannot unilaterally decide tenure criteria that go against current University standards.

Incentives for Faculty Participation

A variety of incentives might improve faculty willingness to improve their level of IT fluency, including:

- If faculty members were given more credit toward tenure and promotion for developing IT-related courses and materials, this would be an obvious incentive for some people to improve in this area;

- If departments would show more interest in developing IT-related courses and materials, it would act as an incentive for their faculty to participate in and become more fluent in this respect;

- Pay faculty to upgrade current courses to FIT status or to create new FITness courses. Such payment would be akin to the pay offered to faculty to develop Web-based courses. In order to develop these courses, faculty would have to exhibit a high level of fluency;

- At a more remedial level, perhaps pay faculty to attend courses, workshops, and colloquia designed to enhance IT fluency. The challenge, of course, is to work out a system for determining which events would qualify for a stipend. Would any departmental workshop

qualify? Would a university-wide initiative be required? Again, we recommend that **departments** take as much initiative as possible to reward faculty for achieving IT fluency;

- Develop and pay a "pool of faculty IT experts" who would be available to (a) lead seminars, workshops, and other training sessions for faculty, (b) tutor other faculty members as they pursue IT fluency, and (c) work with faculty members who are incorporating IT into their courses. These factors would act as an incentive for faculty in two ways: they would encourage FIT (or nearly FIT) faculty members to become involved in helping colleagues achieve FITness, and they would assure faculty members who are not FIT that they will have assistance from their colleagues.

Special Challenge of Part-Time Faculty

As we all know, the University of Memphis has a large number of part-time (adjunct) faculty members. Most of these faculty members spend little time on campus outside of teaching their courses (indeed, many part-time faculty have other jobs), and those who teach off campus seldom come to the main University of Memphis campus at all. Moreover, part-time faculty members are not paid well. It is a challenge, a significant challenge, for departments to even find a time for orientation sessions and other meetings that will accommodate part-time faculty schedules. It will also be a challenge to develop a training program that will facilitate FITness for part-time faculty.

We recommend that the basic, core course in Computer and IT Fluency be developed by tenured or tenure-track faculty. Although part-time faculty members may well teach some sections of this new course because of the anticipated demand for it, they must work within the structure developed by regular faculty members and they must receive sufficient training to become FIT themselves. We believe that part-time faculty members can (and will) improve their level of FITness if on-line resources are made available and if seminars, workshops, and other courses are held at convenient times. For instance, departments might consider holding dinner brown bag sessions on IT in order to attract part-time faculty who teach evening courses. Saturday workshops would also be attractive for some part-time faculty members who work during the week but want to improve their FITness.

We also recommend that most upper-level FIT courses be taught by tenured and tenure-track faculty members. But we also think it important that part-time faculty members achieve a high level of FITness so that it can be reflected in their courses. Departments should establish incentives for encouraging part-time faculty FITness, and they should consider requiring part-time faculty members to demonstrate IT fluency or to attend workshops and seminars to improve in this area.

Costs Associated with Developing Faculty FITness

There are a number of costs associated with developing faculty FITness, but they are all worthwhile investments in both faculty members and students at the University of Memphis. We outline the costs below:

- Compensate faculty and staff for developing and organizing FITness materials and for placing them on-line. Some of this could be handled by FIT undergraduate and graduate students;

- Compensate faculty for attending workshops, seminars, colloquia, and courses that provide instruction in developing FITness;

- Compensate a "pool of faculty IT experts" who would be available to instruct, tutor, and other wise assist colleagues in improving their level of FITness and in developing materials that would enhance student FITness. Some of these experts could also provide instruction at a new "boot camp" orientation program for new students and others;

- As noted earlier, compensate faculty for developing a new Computer and IT Fluency course (including its on-line components) and for upgrading current upper-level courses to "fluent status" or creating entirely new FITness courses;

- Compensate highly FIT graduate students for serving as "on site" consultants to assist faculty members achieve FITness. Eventually, perhaps the U of M could have several graduate-student fellowships each year for this purpose;

- Development of a central pool of faculty resources that will require renovated or new space, and perhaps additional staff positions.

SUMMARY AND CONCLUSIONS

High-quality universities must develop a strategic plan for developing FITness among their students and faculty. Students need to achieve FITness in order to understand and manage change, compete for jobs, and function effectively and ethically in this age of computer and information technology. Faculty members need to achieve FITness for these reasons and also because it will directly improve their research and teaching. New technologies, when used correctly and responsibly, can provide faculty and their students with vast quantities of information and the tools to analyze them. But faculty members and students must have a thorough understanding of the skills, concepts, and intellectual capabilities needed to use, interpret, and analyze information generated through IT. It is an exciting challenge and one

which the University of Memphis should embrace with enthusiasm.

In terms of promoting student FITness, we have recommended that the U of M adopt a university-wide, across-the-curriculum approach that will provide students with a comprehensive core FITness course and a later, upper-level FITness course in their discipline. We have also recommended that this become part of a new Computer and IT Fluency requirement of the University. In terms of promoting faculty FITness, we have recommended that a multifaceted approach be adopted that encourages faculty members to learn more about IT and to become fluent in this area. Indeed, faculty FITness is a prerequisite to student FITness. The University of Memphis needs FIT faculty members to help design, implement, teach, and research IT fluency and development. We are confident that upper-level administrators are truly committed to developing programs that facilitate faculty and student FITness. By working together, faculty, administrators, and students can develop programs that will serve as models for other universities, organizations, and businesses interested in developing FITness.