Best Practices in Technology-Mediated Learning in American Business Education

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ABSTRACT
Many business schools are re-examining management education, and many view advanced information technology as an enabler of innovative and effective learning. How best to approach technology-mediated learning is unclear. To assist institutions to implement technology-mediated education programs and avoid reinventing the wheel, this study examined effective and thoughtful technology-mediated learning initiatives through benchmarking. Results from this study indicate that high levels of institutional resources and commitment are required to effectively implement technology-mediated learning programs.

Keywords
Benchmarking, Business education, Distance learning

Introduction
Changes in the business landscape are affecting employee skill requirements, as well as the tools and techniques used in education. These changes are characterized by shifts in market demands, technology, and growing competition from both traditional and nontraditional sources. Because an employee’s skill, innovation, and expertise form the cornerstone of profitability and economic growth, demand for both a highly educated workforce and the continual development of employee skills has increased.

In 2000 the U.S. Department of Education reported that only 17 percent of American adults age 25 or older held a bachelor’s degree. As a result, nontraditional students are entering post-secondary schools to meet employer demands. In addition, more traditional students are participating in post-secondary education as well. The percentage of high school graduates who enrolled in higher education increased from 57 percent in 1990 to 60 percent in 1999 (U.S. Department of Education, 2000).

In addition to the increasing demand for post-secondary education from Americans, an increase in demand from the global market for higher education at American institutions is anticipated. American institutions of higher education—particularly business schools—are widely viewed as among the finest in the world. According to the U.S. Department of Education, more than 450,000 foreign students studied in the U.S. during the 1995-1996 academic year. It is estimated that for each foreign student currently studying in this country, three other foreigners would study here if they were given adequate resources or access.

Domestic and global demand for post-secondary education will attract new forms of competition from both traditional and nontraditional sources. Many traditional, campus-based business schools are embracing information technology to enhance the effectiveness and reach of their degree programs.

Technology in Education
Information technology is dramatically changing the way organizations are structured, managed, and operated, and the ability to use computer networks is a basic requirement for participation in the IT-focused economy. Professionals seeking recertification and workers seeking skill refreshing or retraining were targeted more by institutions that offered distance education courses in fall 1995 than were other types of individuals (U.S. Department of Education, 1997).

The influx of students and the intensified demands of the job market require new strategies and practices for education. In response, business schools and institutions of higher education in general are re-examining the nature and form of their programs and considering various forms of technology-mediated learning. In this
context, advanced information and communication technology is increasingly viewed as a key resource in enabling innovative and enhanced learning experiences in management education. Some business schools consider technology-mediated educational programs as a differentiator and means of gaining competitive advantage.

However, the approach to change is unclear, and many factors need to be considered. For example, what is the role of information technology in business education? How can barriers to change be reduced? The objective of this study was to understand and capture best practices to avoid reinventing the wheel and reduce the learning curve for institutions of higher education that may be considering or implementing TML initiatives.

**Methodology**

The purpose of this study was to identify and examine successful and exemplary practices (hereafter referred to as best practice) technology-mediated learning (TML) in business and management education. Technology-mediated learning refers to a learning experience that is significantly moderated through the use of information technology. Technology, in this context, may play a variety of roles including: redrawing the physical boundaries of the classroom, substantially enhancing access to learning content and resources, and enhancing the instructor’s access to feedback concerning absorption of material (Alavi & Gallupe, 2000).

The areas of focus included strategic and organizational issues, technology and the learning process, technology and the teaching process, and TML assessment and performance evaluation. The best-practice criteria are listed in Table 1.

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<thead>
<tr>
<th><strong>Strategic/Organizational Issues</strong></th>
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<td>Explicit, articulated objectives for use of technology in management education at various organizational levels</td>
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<td>Technology-mediated learning is a direction and sustainable practice of the organization</td>
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<td>Adequate financial support for TML</td>
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<td>Adequate institutional guidelines and policies to support TML</td>
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<td>Formal process for visioning, planning, implementing, and deploying TML</td>
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<td>Explicit process for motivating, developing, and supporting faculty and staff to engage in TML activities</td>
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<th><strong>Technology and the Learning Process</strong></th>
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<td>Models and alignment of technology and the learning process</td>
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<td>Role of technology in relation to classroom learning experience</td>
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<td>Impact of the process of TML on students</td>
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<tr>
<th><strong>Technology and the Teaching Process</strong></th>
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<tr>
<td>Instructional objectives for the use of technology in courses/programs</td>
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<td>Impact on individual faculty member (change in teaching behavior, faculty satisfaction)</td>
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<td>Reward structure for faculty use of technology</td>
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<td>Resources for support of individual faculty in use of technology in teaching</td>
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<th><strong>Assessment and Performance Evaluation</strong></th>
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<tr>
<td>Level of success in achieving objectives of TML</td>
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<td>Formal performance measures used</td>
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<td>Demonstrated positive impact on student learning</td>
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<td>Formal evaluation of costs/benefits of TML</td>
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*Table 1. Technology-mediated learning: Criteria for best-practice*

The study approach was benchmarking, which is a methodology designed to capture best practices and facilitate their transfer among organizations. Through secondary research and contacting prominent TML researchers, practitioners and program administrators, the study team identified 78 candidate organizations from academic institutions and business, government, and healthcare organizations which were asked to complete a screening survey. More than 40 percent of the candidate organizations completed the screening survey. Based on the responses to the screening survey, six organizations were identified as best-practice organizations based on the criteria. These selected organizations participated in extensive on-site interviews, which were used to gather qualitative and quantitative data from these organizations. At the completion of the interviews, audiotapes of the interviews were transcribed and detailed profiles of the TML initiatives at the six best-practice organizations...
were developed using data from multiple sources (site interviews and study team observations, screening surveys, and TML program documents).

**Results**

The selection process involved evaluating the responses from all 33 organizations that completed the screening survey. The six organizations that best met the criteria were Duke University Fuqua School of Business, Ernst & Young Global Learning Solutions, Ohio University MBA Without Boundaries Program, University of California, Los Angeles—Anderson Graduate School of Management, University of Phoenix Online Campus, and Wake Forest University. Table 2 displays the key attributes of the six best-practice organizations, and the objectives and scope of their TML initiatives.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Type</th>
<th>Objective of TML Initiative</th>
<th>Scope of the TML Initiative</th>
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<tbody>
<tr>
<td>Duke University-Fuqua Business School</td>
<td>Nonprofit, private university</td>
<td>Expand student base, Improve learning &amp; teaching, Improve competitive positioning</td>
<td>Executive and day MBA programs, non-degree executive programs</td>
</tr>
<tr>
<td>Ernest &amp; Young LLP Global Learning Solutions</td>
<td>For-profit consulting company</td>
<td>Increase revenue, Increase access, Improve services, Develop new products/services</td>
<td>All levels of employee training</td>
</tr>
<tr>
<td>Ohio University- MBA Without Boundary</td>
<td>Nonprofit, public university</td>
<td>Expand student base, Enhance brand image, Increase revenue, Improve learning</td>
<td>MBA Without Boundaries executive program</td>
</tr>
<tr>
<td>UCLA- Anderson Graduate School of Management</td>
<td>Nonprofit, public university</td>
<td>Enhance brand image, Improve student satisfaction, Improve competitive position, Improve services</td>
<td>Day and executive MBA programs</td>
</tr>
<tr>
<td>University of Phoenix – University of Phoenix Online Campus</td>
<td>For-profit, publicly traded company</td>
<td>Expand student base, Enhance brand image, Increase revenue, Reduce operating cost, Improve competitive position, Develop new products/services</td>
<td>Graduate, undergraduate, and certificate programs</td>
</tr>
<tr>
<td>Wake Forest University</td>
<td>Nonprofit, private university</td>
<td>Enhance brand image, Enhance student retention, Improve student satisfaction, Increase revenue, Improve learning</td>
<td>Undergraduate and graduate programs on the entire campus</td>
</tr>
</tbody>
</table>

*Table 2. An overview of the best-practice TML initiatives*

From the case studies and 33 screening surveys, 17 key findings emerged in the four criteria categories of the study scope. Due to space limitations, only the nine findings related to technology and the learning process and technology and the teaching process are reported.

**Technology and the Learning Process**

**Cognitive and Behavioral Adjustments for Students**

Just as instructors need to develop new skills for teaching in technology-mediated learning environments, students also need to develop new skills to facilitate learning in these environments. Relative to most traditional classrooms, TML environments are more student-focused than instructor-focused. Thus, the role of the student tends to be more as an active participant rather than as a passive spectator.
TML initiatives involve high levels of interaction, student participation, and information processing. Therefore, the student must make cognitive and behavioral adjustments, as well as be trained on the new forms of learning activities in a virtual environment, which include:

- being an effective participant in online discussion groups;
- giving and receiving feedback;
- sorting through various forms of information;
- processing, interpreting, and synthesizing online information; and
- collaborating and effective teamwork.

According to Carr (2000), when students participate in face-to-face discussions, they automatically adhere to conventional rules of discourse. However, when it comes to communicating electronically, novice students often fail to follow the unwritten guidelines of taking turns and “repair” (refreshing a participant’s short-term memory by repeating a relevant point). It takes approximately three months before students become sensitive to the issues surrounding online communication (Carr, 2000).

Hardware and Software Applications

Although best-practice organizations use much of the same technologies, they did not use a specific single hardware or software application. Many organizations initially developed their own software because the market lacked the appropriate applications. However, as off-the-shelf hardware and software became available, these same organizations embraced standardized applications provided by third-party vendors.

Figures 1 and 2 show the five most frequently used TML tools and their frequency of use among the responding education, business, government, and healthcare organizations.

![Top Five Types of Technology Used (Education)](image)

As shown in Figure 1, the higher education institutions indicated that library databases had the highest frequency of use while the business, government, and healthcare respondents indicated that completely asynchronous, Web-based courses had the highest frequency of use (Figure 2).
No two of the successful TML initiatives involved in this study were identical. Most combined various synchronous and asynchronous elements. The four learning modes (i.e., settings or contexts) observed in TML initiatives were:
1. same place/same time,
2. different place/same time,
3. same place/different time, and
4. different place/different time.

Table 3 provides some examples of these various modes observed at the best-practice organizations.

<table>
<thead>
<tr>
<th>Place</th>
<th>Same</th>
<th>Time</th>
<th>Different</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wired lecture hall</td>
<td>Computer lab</td>
<td>Video conferencing</td>
<td>Web-based delivery</td>
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</table>

With the exception of the University of Phoenix Online Campus, which exclusively uses an asynchronous mode of TML, the remaining five best-practice organizations use a mixed-modality approach in their TML initiatives.

As technology improves and organizations accumulate experience with TML, the mixed-modality approach to TML will become common. For example, organizations that increasingly use the same place/same time mode are recognizing the different place/different time mode and are bringing the distance learning component into their TML initiative.

Explicit, Ongoing Support Mechanisms for Students

Many best-practice organizations provided three types of student support: pre-program, during program, and post-program. As a component of the overall TML training and support, a few best-practice organizations provided library and information searches and management services. All best-practice organizations provided extensive support, primarily in the forms of technical training, computer-equipment support, and help-desk support.
Technical training involved hands-on software training and CD-ROM-based or online tutorial for self-study. The primary objective of the training programs was to ensure a minimum level of competency. However, some training programs were tailored to the skill level of each student.

Technology and the Teaching Process

Faculty Training and Support

Because teaching in a technology-mediated environment requires different skills and approaches than teaching in a traditional classroom, faculty training and support programs must be in place.

The best-practice organizations used a variety of approaches to faculty development and support. Most had undertaken several activities to make instructors comfortable with the new technology in teaching. The most prevalent and explicit support offered involved convenient training and access to technology.

Some institutions also provided pedagogical support to apply technology instructional design. Despite the importance of pedagogical and instructional design support for changing faculty teaching approaches, this form of support has been scant and insufficient in most of the educational organizations interested in TML (Alavi & Gallupe, 2000).

Intellectual Property Issues

As universities expand TML activities and as faculty members increasingly develop online content and TML courses, questions regarding intellectual property and the ownership of courses and material have surfaced.

In this study, we found a variety of methods to account for intellectual property. At UCLA’s Anderson School, individual instructors retain the same ownership rights with online material as they do with textbook material. Whereas the creation of online course materials is in many analogous to the creation of textbooks, in other ways it is not. Unlike the writing of textbooks, the development of online course materials typically involves a significant investment of resources by the institution. As long as internal university resources had not been used in the creation of TML materials, many universities allowed the faculty to retain ownership. In cases where faculty members used university resources in creating intellectual properties in a TML context, intellectual ownership issues were not as clear-cut. At Duke’s Fuqua School, the model is changing to one of joint ownership of profit-making online ventures. Faculty members are beginning to develop core MBA courses that they do not own exclusively and where they share royalties with the institution.

The bottom line is that intellectual property and ownership issues have not been adequately addressed in many TML initiatives (Twigg, 2000). Most universities have not faced the hard challenges yet and admit that they need to look at these issues more closely. The best-practice organizations in this study reflect the current general state of practice in this area.

Disaggregation of the Teaching Process

In the traditional teaching environment, the course instructor decides all issues related to content selection, instructional design, delivery, and assessment. In some TML environments, several individuals perform such roles. For example, faculty members may identify the content, the learning objectives, and competencies that students need to develop, but instructional designers may actually design the instructional events and their sequencing, the packaging of the content, and the exercises. A multimedia developer may translate the course into the TML environment and a fourth person may actually deliver the course.

The disaggregation of the teaching process is less pronounced in public higher education institutions, where a powerful culture traditionally defines the role of faculty members. Course instructors still perform most roles and decide content, delivery, packaging, and pedagogy, with limited assistance for instructional design and technology.
Figure 3 highlights the breakdown in the various teaching roles in the pool of education respondents. For each role, the chart illustrates the percentage of fulfillment by three main types of people: individual faculty, support staff, and external organizations/consultants.

![Fulfillment of TML-Related Faculty Roles](image)

**Incentives to Develop Skills and Use Technology**

Most best-practice organizations expect their faculty to develop skills in teaching with technology. However, some organizations recognize that faculty members need extra time to participate in TML initiatives, particularly inexperienced faculty. Consequently, faculty members were occasionally given extra compensation, time, or specialized forms of support to develop or refine their skills in teaching with technology. The extra compensation tended to be one-time only and not institutionalized.

![Top Five Incentives/Rewards for Faculty Participation in TML Initiatives](image)
The survey respondents were asked what incentives faculty members receive for participating in TML initiatives (Figure 4).

**Mandating Technology in Teaching**

If expectations concerning TML initiatives are not adequately addressed, faculty members may have inaccurate understanding regarding the use of technology in their instruction.

The best-practice organizations rarely mandated instructors to participate in TML initiatives. Faculty members often volunteered to be involved. TML is diffused through peer modeling, encouragement, the voice of students and alumni, and forces in the larger business environment. In MBA programs in particular, student feedback regarding technology is especially strong because students want to align their competencies and skills with the business world.

**Conclusion**

This study offers insights, key trends, and enablers in the area of technology-mediated learning in order to enhance management education programs. The findings provide answers from successful organizations on what role information technology might play in management education and how some implementation barriers can be reduced. Generally, we found that the amount of resources in terms of time, money, and effort to develop and implement effective initiatives is usually underestimated. The educational institutions all felt they invested more in the effort than they originally contemplated. This study’s findings have the potential to help them to better estimate the scope and investment required to launch a successful TML initiative.

**References**


