

# **Integrating Multi-Media Instructional Technology into the Classroom: An Empirical Study of Faculty and Students**

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## **Abstract**

This article presents an empirical study of faculty and students on the integration of multi-media instructional technology in the classroom. The study was originated by a school of business' administration as one phase in the development of a comprehensive multi-media strategy. It focused primarily on the instructor-mode (investing in resources consistent with the faculty's technology experience levels, training needs and course delivery). To address learner-mode, students were surveyed to measure their level of importance associated with instructional technology.

## **Introduction**

Many universities are using instructional technology for promoting learning in many ways (for example, handling courses with large number of students, and accommodating diverse learning styles)[7]. In addition, incoming students have a baseline expectation of multi-media, technology based instruction. This is partially attributed to the impact of the Reauthorized Elementary and Secondary Education Act (ESEA) that contains an Enhancing Education through Technology (Ed-Tech) initiative[8]; thus, incoming college students have certain thresholds or expectations regarding the integration of technology in the

classroom. This is consistent with UCLA's position that the students of today have an information-age mindset. Students learn more by hands on activity and through visual learning [1],[2].

Institutions are addressing this expectation with various technology-enabled classroom designs. For example, Dowling College is constructing 14 state of the art electronic classrooms that are equipped with ceiling projectors, sound systems, VCRs, laserdiscs and slide projectors[5]. All in an effort to help expose students to the technology utilized in the real world of business[14].

Saint Joseph's University has invested \$30 million on "smart" classrooms. They have trademarked the term "teletorium" for their 300 seat high tech auditorium[5].

Salisbury University, in Maryland attempted the "smart classroom" idea on a much smaller scale than those previously mentioned. Adding simple enhancements to include digital projectors, PC and a VCR all enclosed in a podium, all for the cost of approximately \$8,000.00 per classroom[5].

The University of Texas Health Science Center at San Antonio recently spent \$2.2 million to upgrade classrooms with digital

projectors and multimedia systems. Drexel University is building a \$15-million business-learning center that will house technology-enhanced classrooms and lecture halls. Institutions as diverse as Laramie County Community College, Purdue University, the University of Dubuque, Virginia Commonwealth University, and Wake Forest University, among others, have wired up their classrooms[5].

Because technology has become commonplace in many colleges and universities, (almost as commonplace as the chalkboard), dynamic learning environments are flourishing with the growing role of the Internet as the information delivery system integrated within a multimedia environment. To maximize these learning environments, instructional technology, multi-media strategies are critical. Multi-media technology strategies are in two modes: instructor mode and learner mode. To be fully effective, both modes must be using computer-based multi-media. This is what facilitates the transformation of pedagogy[11]. Many institutions focus on the instructor mode by investing in smart classrooms and online course software. At the center of this educational technology is the “smart” podium.

The “smart” podium is a central single interface unit, which enables the instructor to integrate various methods of information technology with ease. “Smart” classrooms, also referred to as electronic or multimedia classrooms are classrooms that utilize this instructional media effectively.

The same educators that, ten years ago, were reluctant to incorporate technology based course delivery are now the innovators and “driving force” for the adoption of this technology (Bisoux, 2003). Thus, many institutions have invested and installed a variety of smart classroom configurations. This faculty or instructor-focus is necessary to enhance pedagogy but is not a full transformation. The learner mode, when successfully accomplished,

indicates the full pedagogical transformation [11].

This article presents a regional, private university business school’s efforts to develop and execute its multi-media technology strategies. It begins with a survey focusing on the instructor-mode, as the initiator of the transformation to gather qualitative and quantitative feedback. Results from the qualitative, open-ended survey led to the development of a Likert-scale quantitative survey that used a modified version of the Lake County school district’s (Adlai E. Stevenson High School<sup>1</sup>) one. Their instrument assessed teachers experience levels with technology and their training needs with various types of multi-media and instructional technology. The learners, the students in this study, were assessed in terms of the importance of multi-media technology in their classroom.

The study presented, in this article, was the foundation for the faculty-level multi media strategy development and execution. Using a model presented by Peled[10], there are various hurdles to overcome and necessary phases for the strategy to be successful. The first was to address concerns from those who feel they won’t “adjust well to the new technological environment” (page 19). Through the qualitative and quantitative assessments, faculty expressed their technology wants, experience levels, and training needs for a wide range of software and hardware (survey is presented in Exhibits I and II). This is one mechanism to identify and quantify the hurdles. Peled’s next step addresses consistency across administrative levels. For the school, in this study, the multi-media technology strategic need was aligned with the school administration and the university’s computing center (contributing more support to the school). A third important step is to pilot the technology. Hence, the smart classroom equipment was piloted in 25% of the school’s classrooms (four out of sixteen). Assignment of the smart classrooms was random. The faculty technology assessment found that 44.4% of the faculty teaches in a classroom that has the smart

podium. For those with smart podium classrooms, 17.6% never used the equipment, 35.3% use it less than 50% of the time while 47.1% of faculty use it 50% or more of the time. Therefore, the ultimate goal of the study was to develop the appropriate strategies for integrating technology into the classroom. This study was an important component of a long term pedagogical transformation that was contingent on support and buy-in from the faculty (instructor-mode) as well as understanding the degree to which the students (learner-mode) felt it was important.

### Method

To address the instructor and learner modes, two types of survey data were collected. For the instructor-mode, data were collected with a four-part survey that was primarily composed of close-ended questions and a general, open-ended comments section. The voluntary and anonymous survey was returned by 53.3% of the faculty (N=28). Respondents were asked to rate their experience levels and need for training in the areas of software, blackboard, banner, statistical/research packages, and products/services. To measure the demand for smart podiums and their future expansion, faculty were asked about their availability/exposure, use of in-classroom equipment as well as its importance. Two questions addressed the collaboration between the University and School's ITS departments in order to measure the perception of alignment between the two organizations.

For the learner mode of this multi-media strategic approach, the exposure, usage and importance ratings were measured using the same survey questions as the instructor-based survey. Undergraduate students in the required MIS, core course were surveyed. This sample represents all business school majors (N = 29).

### Results

The analysis, using SPSS 11.01 for Windows, measured the faculty experience levels with various software instructional technologies (as part of the instructor-mode strategy) and their training needs. In general, faculty rated their experience with the university's online course management system (Blackboard) at the beginner to intermediate level. As noted in Table 1, faculty have more experience with the email and posting features than any other of the blackboard features posed in the survey. Interestingly, the posting and threaded discussion board features had the highest levels of training needs expressed. Those who are currently not using the features were more likely to rate training as important or very important.

Faculty's exposure and usage of smart podium/classrooms and the importance to curriculum delivery were also measured. The percentage of distribution for the importance item was: 17.9% of the respondents thought the smart podium was not at all important, 42.9% were neutral while 39.3% thought it was very important. An initial reaction to this distribution would be that the smart podiums are not considered strong components in the instructor-mode of multi-media technologies. This result is mitigated by examining the responses by those who have smart podium classrooms versus those that do not. For faculty that have the equipment available in their classroom(s), 75% cite it as very important; while only 6.0% of those who have not been exposed to the equipment state that it is very important; 67% were neutral and 27% stated it was not at all important (chi square = 13.37; df = 2;  $p \leq .01$ ). An examination of usage levels, for faculty in smart podium classrooms, indicated no significant difference; although for those using it less than half of the time, two-thirds felt it was very important. In contrast, only half of the heavier users (greater than 50% of the time) rated it as very important.

Table 1

<b>Blackboard Feature</b>	<b>Experience Level</b>	<b>Training Needs (Important and Very Important)</b>
E-mail to groups	42.9% do not use; 7.1% beginner; 39.3% intermediate; 10.7% advanced	26.2%
Digital Drop Box	65.4% do not use; 15.4% each beginner, intermediate; 3.8% advanced	27%
Tests	76.9% don't use; 19.2% beginner; 3.8% intermediate	22%
Virtual Classroom	84.6% don't use; 11.5 beginner; 3.8 intermediate	22%
Postings	38.5% don't use; 15.4% beginner; 26.9% intermediate; 19.2% advanced	36%
Threads/Discussion Boards	65.4% don't use; 23.1% beginner; 7.7% intermediate; 3.8% advanced	35%

For the learner-mode of the strategy, a similar analysis was conducted on smart podium classrooms and their importance. Seventy five percent of the students who had experienced the smart-podium, multi-media technology rated it as very important while 93.3% who had not been in a podium classroom had weaker ratings (neutral, 66.7%; not at all important, 26.7%). As the strategy to be developed would include both the instructor and learner modes, it was critical to measure the difference between the two groups' importance for this multi-media, instructional technology. A t-test comparing the faculty and student importance ratings was conducted. There was no significant difference between the two groups (faculty mean was 2.24; student mean was 2.35) indicating an equivalent level of importance for each group. These results were very encouraging as the school and university administrations evaluated the monetary investment with the potential, positive outcomes on both the instructor- and learner-mode.

### **Discussion**

This study was conducted in order to understand the components of a multi-media strategy for an urban, private university's school of business. As Bisoux[3] states, schools of business need to have state-of-the-art classroom technologies in order to remain competitive. This applies to students learning in a similar, technological environment, as they will be employed. The approach also serves as a

recruitment tool and builds the school's brand as innovative and high-tech (often an effective fund raising tool). With these significant factors, the business school in this study wanted to ensure that its strategy would be effective with its faculty and students. The survey approach allowed the school to develop and implement a strategy based on quantitative input from two critical groups necessary for it to be successful.

Based on the results of the study, a phased-in multi-media strategy has been developed. A financial analysis is being conducted to determine how many classrooms can be equipped with the smart podium equipment (capitalizing on the exposure to the technology is a strong driver of the instructor's importance ratings). In addition, the administration recognizes that there is a shared level of importance for the technology-enabled classroom between the instructor and student. This agreement provides the school with encouragement that increased multi-media in the classroom will facilitate the pedagogical transformation. It also sends a message to the faculty that their input[9] was critical to the strategic direction.

### **Limitations of this Research**

The primary limitation to this study was the sample size. As a small, private institution in an urban setting, the business school has a proportionally sized faculty (N=36). This was somewhat compensated for by the high response

rate. In addition, more input from the learner-mode would provide more input into the full transformation. Upon reaching the full, pedagogical transformation, the school will have brand attributes that it can use in its recruitment, retention, and fund raising initiatives.

### **Suggestions for Further Research**

Although the academic literature has significant articles on multi-media strategy, many are case studies. This study adds to the empirical body of knowledge specifically addressing both modes of a successful, multi-media strategy focusing on pedagogical transformation. It is suggested that further research be conducted in this area to build a methodology as one key component into the strategy development.

### **Endnotes**

Available online: <http://www3.district125.k12.il.us/cchausis/assess/assess.html>

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### **Biographical Information**

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Exhibit I  
Survey Descriptives

**Experience Level**

**Training Needs**

Mean	Median	Standard Deviation	<b><u>Software</u></b>	Mean	Median	Standard Deviation
3.1786	3.0	.5480	Word	2.000	1.0	1.4142
1.4815	1.0	.8932	Access	2.3600	3.0	1.2207
2.5000	3.0	.9230	PowerPoint	2.7692	3.0	1.5049
2.7143	3.0	.8100	Excel	2.9200	3.0	1.5253
3.2143	3.0	.5681	E-mail System	2.6250	2.5	1.5551
1.4615	1.0	.8115	FrontPage	1.9130	1.0	1.3455

**Online Course Management**

Mean	Median	Standard Deviation	<b><u>Blackboard</u></b>	Mean	Median	Standard Deviation
2.1786	2.5	1.1239	E-mail to groups	2.4091	2.0	1.5325
1.5769	1.0	.9021	Digital Drop Box	2.5000	2.5	1.4058
1.2692	1.0	.5335	Tests	2.4545	3.0	1.2994
1.1923	1.0	.4915	Virtual Classroom	2.4348	3.0	1.3760
2.2692	2.0	1.1852	Postings-articles, assignments, power points	2.7727	3.0	1.5409
1.5000	1.0	.8124	Threaded/Discussion Board	2.6087	3.0	1.5297

## Exhibit II

### Distribution of Experience Level and Training Importance

#### Software Packages, Hardware and Electronic Support Services

<b>Software Package</b>	<b>Experience Level</b>	<b>Importance of Training</b> (% Rating Important or Very Important)
Word	92.9% intermediate and advanced	16%
Access	70.4% do not use; 18.5% beginner; 3.7% intermediate; 7.4% advanced	21%
Power Point	25% beginner; 46.4% intermediate; 10.7% advanced	31%
Excel	28.6% beginner; 50% intermediate; 14.3% advanced	36%
Email	7.1% beginner; 64.3% intermediate; 28.6% advanced	33%
Front Page	69.2% do not use; 19.2% beginner; 7.7% intermediate; 3.8% advanced	13%

<b>Product/Service</b>	<b>Experience Level</b>	<b>Training Needs</b> (Important and Very Important)
Scanners	45.5% don't use; 27.3% beginner; 13.6% each for intermediate, advanced	42.8%
Printers	4.5% don't use; 27.3% beginner; 50% intermediate; 18.2% advanced	31.8%
Write CDs	47.8% don't use; 21.7% beginner; 17.4% intermediate; 13% advanced	34.7%
Read CDs	25% don't use; 30% beginner; 25% each for intermediate, advanced	40%
Internet usage in class	25% don't use; 33.3% beginner; 20.8% each for intermediate, advanced	29.2%
Online Library Services	12.5% don't use; 29.2% beginner; 37.5% intermediate; 20.8% advanced	52.2%