# COMPUTER-BASED CLASSROOMS IN BUSINESS SCHOOLS: FACTORS IMPACTING STUDENT PREFERENCES

Thomas W. Gainey, University of West Georgia
tgainey@westga.edu

Jon Anderson, University of West Georgia
janderso@westga.edu

Jeff Rooks, University of West Georgia
jrooks@westga.edu

## ABSTRACT

Universities face increased pressures to both reduce costs and, at the same time, serve more students. Using on-line or virtual education is often viewed as a mechanism to serve these competing interests. Indeed, the number of on-line courses has increased significantly over the past decade. And, while most students actively use the Internet to both collect information and engage in social interaction, the results of this study suggest that they actually prefer the traditional classroom setting for most of their coursework.

## INTRODUCTION

Advances in technology have significantly impacted the manner in which courses are delivered to students. In fact, many universities have made on-line learning an important element of their strategic plans. On-line learning allows institutions to reach a much larger pool of students, offers these students a more flexible alternative for pursing degrees, and can be provided without the costs associated with building space and energy costs (Piskurich, 2006). Given the declining budgets in many universities, the pressure is often great to reduce costs and, at the same time, serve more students. Computer-based learning is often considered a practical approach to reducing these pressures.

The ability to provide courses on-line has been greatly enhanced over the past decade by advances in technology and the declining cost of this technology. A majority of students now have their own personal computers and, in many cases, are no longer confined to accessing the Internet from their home, office, or classroom. Indeed, wireless technologies allow students and instructors access to course materials wherever they may be located.

Given the pressure to offer more computer-based courses, many universities have established incentives to get faculty more involved. Financial incentives to attend various technology training sessions and course releases to then build on-line instruction are common. And, universities are benefiting greatly from the increase in these virtual courses. In addition to serving more students at lower costs, many institutions elect to charge students a premium fee to take on-line courses. These fees are then used to provide necessary technology, training, and personnel to establish computer-based classrooms, and, in some cases, excess fees are then used to cover other budget shortfalls.

A key assumption made by university administrators in encouraging this move to more on-line learning is that student demand for these courses will be strong. On the surface, this belief seems reasonable. One need only observe the extent to which students engage in virtual social networks, exchange text messages, and surf Internet sites to conclude that most students are comfortable with technology and use it often to communicate with others. However, based on comments we have heard from students, we question whether or not computer-based learning provides the college experience that students expect. Thus, this study examines the assumption that students prefer computer-based learning over the more traditional approach.

**THE CHANGING NATURE OF THE CLASSROOM**

With the development of video film over 80 years ago, technology was introduced into the classroom (Mackay & Stockport, 2006). Over the years, instructors have continued to introduce emerging technologies such as television, DVDs, satellite feeds, and computer systems to supplement traditional classroom instruction. However, even with advances in technology and the Internet, the traditional classroom setting has remained the dominant means of delivering courses to students in higher education. Rosenberg (2001) suggests that the inability of students to interact with these technologies may be a primary reason that they have been unable to replace more traditional instruction. But, as technologies become more interactive and as university officials continue to encourage more e-learning, it seems reasonable that the computer-based classroom may one day replace the traditional classroom as the preferred approach. In fact, it is estimated that enrollments in totally on-line courses is increasing 12-14 percent per year (Allen & Seaman, 2008). And, projections from a recent Ambient Insight report suggest that by 2014, 3.55 million students in the United States will take all of their classes on-line and that an additional 18.65 students will take at least some of their classes on-line (Nagal, 2009).

The most basic approach to creating a computer-based classroom is for instructors to simply present materials that they normally cover in class to students over some type of web-based platform (e.g, Blackboard). Students review PowerPoint overheads, read lecture notes, watch short videos, and complete exercises. They then use automated systems to submit work and take exams. While there are opportunities to communicate with instructors and other students via chat rooms and e-mail, most of these on-line courses are self-paced and provide only minimal interaction. A majority of computer-based courses follow this basic, on-line approach. But, others are taking a much more interactive approach by constructing virtual classrooms.

Next generation virtual classrooms take the form of a computer-based simulated environment. Using Internet-based virtual worlds such as *Second Life*, instructors can construct classrooms.

Students, taking the form of avatars, then enter these simulated classrooms and interact with others. Unlike the on-line courses that primarily present information and then automatically grade and post assignments, these virtual classrooms provide real-time simulations and significantly more interaction. For example, virtual environments can be constructed to mirror college classrooms, student centers, and laboratories. Students and instructors, as avatars, can move around these environments and enter the virtual rooms at regularly scheduled times. Real-time communication can then take place using text, graphical icons, chat, and gestures (Wang & Braman, 2009). While some faculty are skeptical of these digital classrooms (Foster, 2007), it is estimated that hundreds of educational institutions now own or rent land in Second Life (Linden Research, 2009).

Given the emergence of computer-based alternatives for conducting college classes and the limited research that has been conducted in this area, this study took an exploratory approach and examined a broad range of factors that were believed to offer some insight into student preferences. First, the study examined the extent to which students felt comfortable with Internet applications. It was expected that the more students who used the Internet on a regular basis, the more they would be favorably disposed to computer-based learning.

Second, the study examined how the type of course might impact student preferences. It was believed that courses primarily designed to simply provide information and that offered minimal student participation would likely be perceived as good candidates for computer-based learning.

Finally, the study examined individual differences among students. In terms of academic-related factors, it looked at both the students' major area of study and students' preferred learning style. It believed that certain majors, where more objective material is presented on a regular basis (e.g., Accounting), might be more suited to computer-based instruction. It was also thought that the learning style (visual vs. verbal vs. kinesthetic) of the student might be particularly influential in how they perceived computer-based learning.

The study also looked at how individuals with competing demands on their time might perceive computer-based classrooms. Specifically, those students with longer commutes to school and those who were employed would be more likely to prefer on-line alternatives. In fact, it was believed that those students with longer commutes would be especially interested in on-line alternatives because it would save not only drive time, but also the costs associated with operating an automobile.

The study then attempted to gain some insight into the impact of computer-based learning on social interaction among the students. It did this by looking at one's age and relationship status. It was believed that younger students, who had grown up in the MySpace/Facebook era, may be more comfortable with on-line interaction and see computer-based learning as simply an extension of their normal social activities. Additionally, it was believed that individuals who were not in a committed relationship might prefer more traditional classroom settings. Given that many students meet their future spouse while in college, the social interactions afforded by face-to-face classes would be an important part of the "college experience."

## METHODOLOGY

One hundred and ninety junior and senior undergraduate students in a university business school participated in this study for extra credit. Two surveys were administered to the students. The first survey asked questions related to demographics, learning styles, and Internet use. The second survey asked about student preferences regarding the delivery of courses. Prior to administering the second survey, students viewed a brief PowerPoint presentation that described, in very general terms, differences between traditional classroom instruction, on-line classes, and virtual classrooms.

Of the 190 students participating in this study, 51% were management majors, 12% were marketing majors, 9% were accounting majors, 6% were finance majors, and the remaining students were in disciplines such as Management of Information Systems (MIS), economics, and real estate. The average age of the respondents was 22 years and they reported working just over 17 hours per week. Over 84% of the students lived off campus and reported, on average, commuting 11 miles each way.

The primary purpose of this study was to begin to explore how students feel about computer-based learning and to indentify some of the factors that might influence their perceptions. While a correspondence analysis on the data was not conducted, given the relatively modest sample size of the study and the number of categories involved in some of the tables, there was insufficient power to find significant statistical differences for most of the factors examined. Thus, with the exception of the types of courses, where one was able to use all 190 responses for each category, only descriptive statistics and general trends are reported in the results below.

## RESULTS

### Internet Proficiency

Using items from the Internet Addiction Test (IAT) (Widyanto & McMurran, 2004), the extent to which our respondents used the Internet on a regular basis was first determined. Table 1 shows the percentage of respondents that replied either frequently, often, or always to four items from the IAT.

### TABLE 1. INTERNET ADDICTION ITEMS

|  |  |
| --- | --- |
| How often do you find that you stay on-line longer than you intended? | 68% |
| How often do you check your e-mail before something else that you need to do? | 60% |
| How often do you lose sleep due to late-night log-ins? | 22% |
| How often do you choose to spend more time on-line over going out with others? | 6% |

These responses show that over two-thirds of the students admitted that they use the Internet more than they should. However, based on the responses, their Internet use does not appear to

significantly interfere with sleep or social interactions. Additionally, 91% of respondents indicated that they had a Facebook account and 52% noted that they also had a MySpace account.

Even though our sample appeared to be computer savvy and comfortable with Internet applications, overall results showed that the traditional approach to delivering classroom instruction was preferred by most students. Specifically, when asked which method of delivery was most preferred, 74% selected the traditional approach, 21% chose the on-line approach, and only 5% indicated that they would prefer the virtual classroom. Given the novelty of the interactive, virtual classroom and the ability to create and customize avatars, it was a surprise that more students did not select this option as the preferred method. When questioned about the avatars, 72% admitted that they found the avatars *interesting* and 51% indicated that they found the avatars *entertaining*, but 35% noted that they were also somewhat *creepy*.

While the traditional classroom was the clear preference of the respondent group, most students did express a desire to take at least some of their coursework in a computer-based environment.

**Course Preferences**

In the survey, students were asked to select the method of delivery that they would be more comfortable with for eight different categories of courses. Students could select traditional, on-line, or virtual classroom instruction. A correspondence analysis of the data revealed a significant difference (Chi-square – 218.66, $p < .001$) in the responses. Table 2 provides the results.

Study respondents clearly prefer taking Math courses in a traditional classroom. Given the objective nature of this material, one might consider this an ideal fit for computer-based learning. However, many students seem to struggle with math courses, and they may feel that face-to-face communication with the instructor is critical to success.

There also was a clear preference to take major business courses in a traditional setting. In fact, students expressed a desire to take almost 80 percent of their major courses in a traditional classroom. Given these findings, business schools that are significantly increasing the number of computer-based courses should make certain that they do not progress so quickly that their students become dissatisfied.

Students were much more interested in taking their humanities and social sciences either on-line or in a virtual classroom. Given that respondents in this study were business students, one might question if these results can be generalized to other students groups.

**TABLE 2. PREFERENCES BY CLASS TYPE**

|  | *Traditional* | *On-Line* | *Virtual* |
|---|---|---|---|
| Math | 88% [a] | 8% | 3% |
| Major Business Courses | 79% [a] | 11% | 7% |
| Sciences | 74% [a] | 14% | 12% |
| English | 68% [a] | 19% | 12% |
| Oral Communication | 67% [a] | 18% | 15% |
| Introductory Business Courses | 65% [a] | 24% | 10% |
| Humanities/Fine Arts | 38% [b] | 43% | 19% |
| Social Sciences | 37% [b] | 47% | 15% |

*Note: Percentages with the same letter are not significantly different.*

**Individual Factors**

In the survey, students were asked to select the percentage of each type of learning environment (traditional, on-line, or virtual) that they would prefer during their college education. The study then examined these responses across a number of individual factors to try to determine areas that were potentially important in influencing student perceptions.

*Academic Major*

Table 3 shows that there were some differences between academic majors. Most notably, marketing students showed a clear preference for more traditional classes. Given that more extroverted students often gravitate toward careers in sales management, it seems reasonable to assume that they may desire more interaction and face-to-face meetings with their professors and classmates.

On the other hand, finance and MIS majors did not express as much of a desire for traditional classes as the other majors. It is not surprising that MIS majors would feel comfortable with computer-based classrooms. In fact, MIS majors actually lead the other groups in their desire to have virtual classrooms. However, initially there was uncertainty why finance majors responded as they did. Results actually show that finance majors expressed more of a desire for the on-line classroom setting than any of the other academic majors. In retrospect, it is believed that the student responses may have been influenced by the on-line skills of the finance faculty. Many of the finance faculty have several years of experience in on-line learning and have developed very interesting and effective on-line courses. Thus, it is possible that the faculty served as a moderating influence on the student responses.

**TABLE 3. PREFERENCES BY ACADEMIC MAJOR**

|  | *N* | *Traditional* | *On-Line* | *Virtual* |
|---|---|---|---|---|
| Marketing | 22 | 68% | 25% | 7% |
| Other | 12 | 68% | 23% | 9% |
| Accounting | 17 | 62% | 27% | 11% |
| Double Major | 25 | 61% | 28% | 11% |
| Management | 95 | 59% | 27% | 14% |
| Finance | 11 | 55% | 32% | 13% |
| MIS | 3 | 55% | 28% | 17% |

## Learning Styles

In this survey, students were asked to identify themselves as either visual, verbal, or kinesthetic learners. Visual learners benefit most from pictures, charts, written notes, and diagrams. Verbal learners seem to retain information better when they can hear information being presented, relying on voice inflections and body language to communicate the intended message. Kinesthetic learners do their best when they have hands-on experiences (Drago & Wagner, 2004). Methods such as role playing, simulation, and laboratory settings work best with this group.

As shown in Table 4, those students who identified themselves as verbal learners preferred to take almost 75 percent of their courses in a traditional setting where they could both hear and see the instructor. And, those who learned best through seeing the information were most favorably disposed to on-line courses. Given that most of the information communicated through on-line courses is available in written form, visual learners may be predisposed to successfully complete coursework provided in computer-based environments.

**TABLE 4. PREFERENCES BY LEARNING STYLES**

|  | *N* | *Traditional* | *On-Line* | *Virtual* |
|---|---|---|---|---|
| Kinesthetic | 27 | 63% | 27% | 10% |
| Verbal | 19 | 74% | 18% | 7% |
| Visual | 88 | 58% | 29% | 14% |
| Not Sure | 32 | 61% | 28% | 12% |

## Commute Time

Table 5 shows that for students actually commuting, those with the longer drive seemed to prefer more computer-based learning. Unexpectedly, however, students living on campus were also inclined to take more computer-based classes. In fact, this group reported that they would take 15% of their courses in a virtual classroom. The rationale behind these results is unclear. However, it is possible that students living on campus may believe that any problems encountered using computer-based classrooms could be more easily resolved since they could simply walk across campus and meet with instructors during office hours.

TABLE 5. PREFERENCES BY COMMUTE TIME

| | N | Traditional | On-Line | Virtual |
|---|---|---|---|---|
| Live On Campus | 36 | 57% | 28% | 15% |
| Commute < 10 Miles | 113 | 63% | 25% | 12% |
| Commute 10-24 Miles | 14 | 63% | 31% | 6% |
| Commute 25 Miles or More | 33 | 56% | 30% | 14% |

*Hours Worked*

While there was little difference across respondents who either did not work or who worked part-time, the flexibility offered by most computer-based courses was appealing to full-time workers. Table 6 shows that those working full-time expressed a desire to take less than half of their courses in a traditional classroom setting.

**TABLE 6. PREFERENCES BY HOURS WORKED**

| | N | Traditional | On-Line | Virtual |
|---|---|---|---|---|
| No Work | 58 | 64% | 24% | 12% |
| < 20 hours/week | 50 | 59% | 29% | 12% |
| 20-39 hours/week | 67 | 62% | 28% | 10% |
| 40 or more hours/week | 15 | 48% | 31% | 21% |

*Age*

Surprisingly, the younger respondents in our survey preferred more traditional classes than the older respondents. Given that younger students have been exposed to computer-based applications for most of their lives, it was assumed that they would feel more comfortable with on-line and virtual learning. Yet, as shown in Table 7, the 19-20 year old students preferred to take about two-thirds of their courses in a traditional classroom setting. It is possible that the self-paced nature of many computer-based systems may be daunting for younger students who may not yet feel comfortable managing college coursework.

**TABLE 7. PREFERENCES BY AGE**

| | N | Traditional | On-Line | Virtual |
|---|---|---|---|---|
| 19-20 years old | 45 | 66% | 26% | 8% |
| 21-22 years old | 94 | 59% | 27% | 14% |
| More than 22 years old | 48 | 58% | 28% | 14% |

*Relationship Status*

As anticipated, respondents who reported that they were in a committed relationship were inclined to take more computer-based courses. However, given the opportunities to meet individuals in the traditional classroom setting, it was anticipated that the difference would be larger than the percentages contained in Table 8. It is possible that the respondents felt that they

had a sufficient number of other social outlets so that those created in the traditional classroom were not that meaningful.

TABLE 8. PREFERENCES BY RELATIONSHIP STATUS

|  | N | Traditional | On-Line | Virtual |
|---|---|---|---|---|
| Not In A Relationship | 103 | 62% | 25% | 12% |
| In A Relationship | 85 | 58% | 29% | 12% |

**CONCLUSION**

Given advances in technology, and the affordability and availability of personal computer systems, computer-based learning offers a viable alternative for the delivery of courses. And, considering the current, weak economy and the resulting budget cuts, many universities are gravitating toward more of these on-line learning environments. Potentially, computer-based courses can serve more students at a reduced cost.

Unfortunately, administrators may incorrectly assume that student demand for these on-line courses will be strong. And, given the extent to which students surf the Internet, use e-mail, and participate in on-line social networks, there is a reasonable basis for this assumption. However, based on the results of this study, almost 75 percent of the business students surveyed were much more inclined to take traditional classes. Student preferences for the traditional classroom setting were significantly higher in math courses and major business courses. And, while not statistically significant, trends in the data also suggested that one's preference for computer-based courses is potentially influenced by such factors as a student's major area of study, learning style, hours worked per week, relationship status, commute time, and age.

Undoubtedly, computer-based classrooms have the potential to open up a much larger pool of potential students for universities. Additionally, universities that fail to provide on-line learning opportunities may find themselves at a competitive disadvantage. However, our findings suggest that administrators should proceed with some caution and closely monitor student evaluations of computer-based courses. Based on our findings, the proper balance of traditional verses computer-based classes will likely depend on both the types of courses offered and individual characteristics of the student population.

**Suggestions for Future Research**

There are additional research opportunities related to the increased use of computer-based classrooms. First, it might be interesting to examine the impact that faculty experience with online instruction has on student perceptions. This body of research has shown a trend where both MIS and finance majors were more favorably inclined to take computer-based classes. And, coincidentally, at the university where the students were surveyed, the faculty in these disciplines had the most experience with on-line classes. It is also possible that certain faculty gravitate toward computer-based learning. And, examining the factors that determine faculty success with computer-based learning might be beneficial in improving the quality of these courses.

Second, given the students' overall desire for traditional courses, future research should attempt to determine additional factors that might be impacting these preferences. It is possible that students may perceive that virtual classes simply do not provide the social interactions and mentoring opportunities that they believe should be part of the "college experience."

Finally, it might be interesting to examine how learning outcomes are impacted by more computer-based instruction. In many universities, learning outcomes are assessed by in-class exercises, oral presentations, and group activities. And, because assessment is carefully examined during accreditation visits, universities must ensure that a common, consistent means of assessment is used across both traditional and computer-based classes. Thus, it might be useful to investigate potential assessment issues raised by computer-based learning.

## Limitations

It is important to mention several limitations associated with this study. First, all respondents were from the same university. Thus, the extent to which the results can be generalized to other student populations is questionable. It is possible that factors such as the location and size of the university could impact the results.
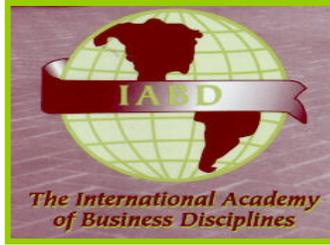
Second, while we were able to report descriptive statistics and show trends in the data, given the modest sample size and the number of categories involved in some of the factors examined, there was insufficient power to find significant statistical differences for many of the individual factors.

Third, the average age of this sample was 22 years and only about 25% of the sample was older than 22. As one gets older and has to find ways to better balance family obligations with other responsibilities, it seems reasonable that perceptions regarding the flexibility afforded by computer-based classrooms may change. Thus, it is possible that these results cannot be generalized to universities with more non-traditional student populations.

## REFERENCES

Allen, I. E., & Seaman, J. (2008). Staying the Course: Online Education in the United States. Needham, MA: Sloan Consortium.

Drago, W. A., & Wagner, R. J. (2004). Vark Preferred Learning Styles and Online Education. *Management Research News, 27*(7), 1.

Foster, A. L. (2007). Professor Avatar: In the Digital Universe of Second Life, Classroom Instruction Also Takes on a New Personality. *Chronicle of Higher Education, 54*(4), 24.

Linden Research. (2009). *Virtual Environments Enable New Models of Learning*. Retrieved from http://secondlifegrid.net/slfe/education-use-virtual-world

Mackay, S., & Stockport, G. J. (2006). Blended Learning, Classroom, and E-Learning. *The Business Review*, *5*(1), 82-88.

Nagal, D. (2009).  Most College Students to Take Classes Online by 2014. Retrieved from http://campustechnology.com/Articles/2009/10/28/Most-College-Students-To-Take Classes-on-Line-by-2014.aspx.

Piskurich, G. M. (2006). e-Learning Fast, Cheap, and Good. *Performance Improvement*, *45*(1), 18-25.

Rosenberg, M. J. (2001). E-Learning – Strategies for Delivering Knowledge in the Digital Age. New York: McGraw Hill.

Wang, Y., & Braman, J. (2009). Extending the Classroom Through Second Life. *Journal of Information Systems Education*, *20*(2), 235-248.

Widyanto, L., & McMurran, M. (2004). The Psychometric Properties of the Internet Addiction Test. *CyberPsychology & Behavior, 7*(4), 443-450.