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A Comparision of College and High School Students in an Online IT Foundations Course

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Abstract

As computer science and information systems departments face declining enrollments, we must find ways to attract and retain students. One option is through partnering with high schools to attract students into the IT field. As we work to reach more students, distance learning offers an alternative method to reach many students. However, some argue that satisfaction levels of students taking distance learning courses is lower than that of students taking traditional courses. This study compares the satisfaction levels of high school students and college students taking an almost identical IT Foundations course. Preliminary results suggest that levels of satisfaction for the two groups are similarly high. Several potential areas of improvement in delivery of distance learning courses are also discussed.

Keywords: Distance education, high school students, introductory computing course, satisfaction, motivation, IT foundations

Introduction

Studies have shown that schools at all levels are using distance learning at an increasing rate (Mupinga, 2005). Although some studies have reported lower student satisfaction with distance learning delivery of course material as compared to traditional delivery methods (Phillips & Peters, 1999; Ponzurick, France, & Logar, 2000; Thomerson & Smith, 1996; Vamosi, Pierce, & Slotkin, 2004), other studies have reported no difference in levels of satisfaction (Inman, Kerwin, & Mayes, 1999; Phillips & Peters, 1999). This project builds upon previous research and develops a survey to measure student attitudes regarding the delivery of an online IT Foundations course. We will compare levels of satisfaction, motivation, anxiety, and other variables between college and high school students taking an almost identical introductory computing course.

Background

Previous studies have shown that there is little difference in motivation for taking distance learning courses between community college and high school students (Roblyer, 1999), but we have found no studies that explicitly study and compare satisfaction levels between high school and college students taking a similar course. As universities and community colleges begin to establish partnerships with high schools to deliver college courses (Harvey, 2004), understanding the difference in satisfaction, motivation, and performance between these two groups of students is essential to deliver effective course material at both levels.

Multiple authors have studied the distance learning experience, although few have focused on delivery of IT courses, and even fewer have included high school students in their studies. Katz (2002) reported that college

student satisfaction with learning and motivation to take distance learning courses were positively related to a preference for distance learning. Ponzurick et al. (2000) conducted research on graduate marketing students and found that these students thought distance learning was less effective and less satisfying than a comparable face-to-face course. These results correspond to the analysis reported by Vamosi et al. (2004), who found that students in an accounting principles course had lower satisfaction with distance learning as compared to face-to-face alternatives.

Inman et al. (1999) found that students in community colleges were highly satisfied with distance learning instructors and courses taught using the distance learning option. Correspondingly, Phillips and Peters (1999) found that the satisfaction of distance learning and traditional students were not different.

Of the few authors that have described distance learning experiences with IT-related courses, Gal-Ezer and Lupo (2002) reported on their analysis of student attitudes towards use of the Web in computer science classes in Israel. They found that students with more college experience tended to use the Web more extensively than their less experienced peers. Moreover, the authors found that students who were more likely to use and be successful with Web-based alternatives had a high level of self-study ability.

Carswell et al. (2000) completed a study comparing students in a traditional undergraduate computer science course to those students in a distance learning environment. They found that both groups had similar learning experiences and similar grades.

In this study, we compare satisfaction, motivation, and performance levels of college and high school students taking an almost identical IT Foundations course. To develop the survey, we used a number of previously validated and tested instruments. Previous survey items were grouped into the following categories: satisfaction with course, satisfaction with distance learning, satisfaction with technology, instructor satisfaction, interaction with instructor, interaction with other students, persistence, and prior experience.

Methodology

Survey

We developed the survey based on previous research into satisfaction with distance learning, satisfaction with the instructor, interest in computer science, and motivation to succeed in the classroom. The surveys were identical, with the exception that the high school students commented on their satisfaction with the instructor, the teaching assistant, and the high school teacher on site, who served as a facilitator. The college students only commented on their satisfaction with the instructor, since they did not have a teaching assistant or other teachers for their course. The high school survey consisted of 73 multiple-choice questions, while the college survey contained 61 questions. Students responded to the questions using a Likert scale from 1=”Strongly Agree” to 5=”Strongly Disagree.” Demographic data and open-ended questions were also included as part of the survey.

Participants

Each survey was administered electronically to student volunteers. Of the 27 students in the college course, 21 voluntarily participated, while 84 of 93 students in the high school course agreed to participate. The college students completed the survey in WebCT, while high school students used Blackboard.

The college course was advertised as an online course, both in the printed and online schedule information. Students self-selected to register for the online course, and multiple traditional (face-to-face) sections for the same course were available for them to select. Seven males and 14 female college students completed the survey. Their average cumulative GPA was 3.00. Thirteen different majors were represented, with Psychology majors accounting for five of the students. Since a number of majors across campus require the introductory computing course, having a wide variety of majors in a section is not unexpected. Only four of the students majored in computer science, information systems, or geographic information systems. Final course grades included seven As, eight Bs, five Cs, and one D, for a course average of 3.00. Ethnicity information was unavailable for the college students.

All of the high school students went through a competitive interview process to participate in the program. GPA, mathematics ability, teacher and counselor recommendation, and interest in computing were all factors in selection of students for the program. Forty-nine male and 34 female high school students completed the survey and provided demographic information. There were 28 African-American, seven Asian, 13 Hispanic, and 26 White high school students. Their average cumulative GPA was 3.43. Final course grades included 24 As, 38 Bs, 12 Cs, 4 Ds, and 6 Fs, for a course average of 2.8.

Preliminary Results

Since we had a small number of participants, we only report summary results in this section. Both college and high school students generally did not regret enrolling in the online course and would encourage others to take the course in a similar format. Over 85% of college and 86% of high school students agreed or strongly agreed that they did not regret enrolling in the course. Approximately 81% of college and high school students agreed or strongly agreed that they would encourage others to take the online course.

Overall satisfaction with the course differed somewhat, with over 90% of college students agreeing or strongly agreeing that they were satisfied with the online course, while only 76% of the high school students agreed or strongly agreed that they were satisfied. Approximately 86% of both college and high school students were satisfied with the opportunity for class participation in the online course.

Just over half of the college students agreed or strongly agreed that they were interested in computer science. Based on the range of majors represented in the college section of the course, these results were not unanticipated. Almost 78% of the high school students either agreed or strongly agreed that they were interested in computer science. Because of the selection criteria used to select the high school participants, we anticipated that most of these students would have an interest in computer science.

Over 90% of the college students strongly agreed or agreed that they were satisfied with the distance learning experience, as compared to only 64% of the high school students. The college students self-selected the distance learning option. In fact, the online section was highly popular and filled to capacity before other traditional sections. The high school students, on the other hand, often did not have an opportunity to select a more traditional learning environment. Most of the high schools did not offer an in-class option. Thus, some high school students who selected this course may not have otherwise chosen a distance learning experience and may have been more unhappy with the option than their self-selected college counterparts.

Both groups of students reported generally favorable satisfaction with the instructor, and in the case of the high school students, satisfaction with the teaching assistants and on-site teachers. Both groups also reported generally favorable satisfaction with the accessibility and responsiveness of the instructor. In fact, all of the college students agreed or strongly agreed that the instructor was responsive to student needs, while 88% of high school students agreed or strongly agreed.

The students differed markedly in their intent to register for future online courses. Almost 81% of college students agreed or strongly agreed that they planned to enroll in other online courses. However, only 36% of high school students agreed or strongly agreed that they planned to enroll in other online courses. Again, the self-selection of the college students to enroll in an online course in the first place may make them more likely to enroll in another online course. Further, high schools in the area have not had a large selection of online courses available to their students until recently, so the students may have been unaware of other online course opportunities.

Almost both sets of students had experience working with word processors and spreadsheets, only 52% of the college students and 44% of high school students agreed or strongly agreed that they had experience working with databases. All of the students agreed or strongly agreed that they felt comfortable working with computers.

Only 49% of the high school students agreed or strongly agreed that they planned to go to college, while 71% of the college students agreed or strongly agreed that they planned to go to graduate school. Since we targeted underrepresented groups in the high school population, including minorities, women, and first-generation college students, they may be less likely to attend college. However, we hope that with the intensive efforts of this program and its continuation through AP Computer Science, we will attract these students to attend college and major in science, mathematics, or computing.

Discussion

Our preliminary summary results indicate that high school and college students have some similar levels of satisfaction with an online, introduction to computer science course. The students in our sample experienced high levels of satisfaction and generally did not regret enrolling in the course. This provides preliminary support for our contention that high school and college students will not differ in their levels of satisfaction with an online introduction to computer science course.

Although the college students were overwhelmingly satisfied with the distance learning experience, a smaller group of high school students were satisfied with the experience. In our future selection process, we plan to better inform students of the type of environment they will encounter in an online course to avoid an expectation mismatch. Further, by selecting a student that is more likely to succeed in the online environment, we may increase the number of students who plan to enroll in other online courses. As high schools begin to offer more online learning opportunities, we must work to train students on what to expect and how to succeed in the distance learning environment.

The survey results indicated that most of the students at both levels had experience using word processors and spreadsheets, while few had experience with databases. This information may be helpful to high school curriculum coordinators who implement changes in the classroom. It appears that most high school students already have basic knowledge of how to use word processors and spreadsheets, so applications classes could focus on other application tools, such as databases. Further, time currently spent teaching basic applications skills in computing can be re-tooled to help develop problem-solving skills and logical thinking.

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