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ABSTRACT
In this paper, we describe initial results of a survey taken by freshman and first-year transfer students at DePaul University during the 2009-2010 academic year. While DePaul is unusual in offering a large number of technically-oriented degree programs and this information is prominent in promotional literature, no study of the impact of multiple degree programs on the recruitment of first-year students had been conducted. The results of this initial study show that while a large majority of students indicate that the number of degree programs is a positive factor for application and enrollment at DePaul, more important factors include the reputation of DePaul and the fact that DePaul is a liberal arts institution.

1. INTRODUCTION
The College of Computing and Digital Media at DePaul University (DePaul CDM) is one of the largest and most innovative information technology institutions in the country with nearly 1,000 undergraduates enrolled in 14 Bachelors degree programs. DePaul CDM is unusual in its breadth of degree programs, and the large number of degree programs is one of the key elements in promotional material used by the institution. However, no study of the impact of multiple degree programs at DePaul CDM on the recruitment of first-year students had been conducted, so the effectiveness of this approach to recruitment is unknown.

Effective recruitment is important because despite favorable job projections, the numbers of students enrolling in programs in computer science, information systems, and information technology programs in recent years has continued to decline. This is of great concern to universities and industry alike. Whether the major is technical or in other areas such as economics and accounting, when the number of students goes down the interest in how and why students choose a particular major goes up (Carter, 2006; Chen, Jones, & McIntyre, 2003; Calkins & Welki, 2006).

As may be expected the literature consistently shows that interest in a particular subject is most likely to influence a student's major selection. Calkins and Welki (2006) found this to be very important or important for 93% of senior economics and non-economics majors surveyed in a study about factors that influence major selection. Malgwi, Howe, and Burnaby (2005) examined factors that influenced major selection for incoming business students and found interest in the subject matter to be the highest rated influence. Downey, McGaughey, and Roach (2009) explored why students chose to major in MIS or CS and found the most influential factors were interest in the field and compensation. Walstrom et. al. (2008) also found that personal interest in the subject matter was the most important factor followed closely by a series of factors relating to post-degree career prospects including probability of employment in the field, potential salary, and prestige.

Howles (2007) is conducting a longitudinal study of computer science students at Rochester Institute of Technology to explore "connections between student values, learning styles and opinions to determine if predictable parallels can be made to student grades, persistence at school, and overall retention" (Howles, 2007, pp. 18-19). Part 3 of her survey looks at major and institution selection particularly student's confidence in their choice of major. More than three quarters of the students in the first three years of the study express strong to very strong confidence in their major choice. Fewer than 5% express discomfort with their choice.

Surprisingly the reputation of the university or degree program does not appear to be a key factor in student major selection. In the Walstrom, et. al. (2008) study the reputation of the degree program was 10th on a list of 27 factors with reputation of faculty 13th. In a study examining the choice between MIS and CS majors, the department's reputation was 16th on a list of 21 factors (Downey et. al, 2009). Calkins and Welki (2006) found only 55% of respondents believed the teaching reputation of department faculty was an important or very important factor in their choice of an economics major.

Previous studies also show that parental influence seems to be minimal on student major selection. In the Calkins and Welki (2006) study, only 39% believed parental encouragement and opinion was an important of very important factor. Low influence of parents was also noted in the Malgwi et. al. (2005) study. The Downey et. al. (2009) study showed parental influence at 17th on a list of 21. Only the Walstrom et. al. (2008) research showed family influence with any prominence and then only 11th on a list of 27.

In designing our study we took many of the same factors into account that previous researchers have, including previous interest in the subject matter, the reputation of the institution, and the influence of parents or other important figures in students' lives. In the remainder of the paper we describe the study motivation and logistics, analyze the data obtained for the study, and draw some conclusions about the factors influencing students to enroll at DePaul CDM.

2. STUDY MOTIVATION AND LOGISTICS

DePaul CDM is one of the largest and most innovative information technology institutions in the country. Over 2,000 graduate students and nearly 1,000 undergraduates are enrolled in 14 Bachelors and 15 Masters degree programs. DePaul CDM has two schools, the School of Computing which includes degree programs in computer and information science, and the School of Cinema and Interactive Media which includes programs in the digital arts and interactive media. Some degrees, such as Computer Game Development, are joint programs between the two schools. Some degrees are also joint with other colleges at DePaul, such as the College of Commerce and the School for New Learning.

DePaul CDM is unusual in its breadth of degree programs, something that is facilitated both by its size and by the flexibility with which new courses and degree programs can be created. The large number of degree programs offered at DePaul CDM is one of the key elements in promotional material used by the institution, and DePaul CDM has attracted large numbers of students during a period of overall decline in technology education enrollments (Perkovic and Settle, 2007). However, no study of the impact of multiple degree programs on the recruitment of first-year students had been conducted. In this work we present initial results from a study that considered whether the variety of technical degree programs available at DePaul CDM is a contributing factor in the decision made by students to enroll at DePaul and CDM.

2.1 Survey Logistics

In order to understand the factors that students took into account when applying to and enrolling in DePaul CDM, a student survey was developed. The survey was implemented online and was sent to first-year students, both freshman and first-year transfer students, after their first quarter at DePaul University. The results given in this report were from the 2008 – 2009 academic year. 296 first-year students over the age of 18 were asked by e-mail to complete the survey in January 2009. 103 responses were received for a response rate of 34.79%.

2.2 Survey questions

The students were asked to complete a survey with 18 questions. Five of the questions were demographic in nature, eleven of the questions asked for yes/no responses regarding the reasons for applying to and enrolling at DePaul University and CDM in particular and two of the questions asked the students to indicate which factors had influenced their enrollment decision.

The survey questions and the responses the students could provide are listed below. Unless otherwise indicated the students were to select one of the options provided:

1. Sex
    a. M
    b. F
    c. Prefer not to specify
2. Age (text box to be completed)
3. I am:
    a. A freshman
    b. A first-year transfer student
    c. Other
4. My major is:
    a. Animation
    b. Computer games development
    c. Computer graphics and motion technology
    d. Computer science
    e. Digital cinema
    f. E-commerce technology
    g. Information assurance and security engineering
    h. Information systems
    i. Information technology
    j. Interactive media
    k. Math and computer science
    l. Network technology
    m. Other
5. What other postsecondary schools (e.g. colleges or universities) have you attended (text box to be completed)
6. I knew that I was interested in a major in computing or the digital arts prior to considering any college
    a. Yes
    b. No
7. I knew that I was interested in a major in computing or the digital arts prior to considering DePaul University
    a. Yes
    b. No
8. When I applied to DePaul University, I was aware of the number of degree programs available in the College of Computing and Digital Media (CDM)
    a. Yes
    b. No
9. The number of degree programs available in CDM positively influenced by decision to apply to DePaul
    a. Yes
    b. No
10. My parents influenced my decisions about college
    a. Yes
    b. No
11. Someone other than my parents influenced my decision about college
    a. Yes
    b. No
12. If you answered yes to the question above, who other than your parents influenced your decisions about college? (text box to be completed)
13. When I applied to DePaul, my parents or other influential person(s) were aware of the number of degree programs available in CDM
    a. Yes
    b. No
    c. Don't know
14. The number of degree programs available in CDM positively influenced my decision to enroll at DePaul
    a. Yes
    b. No
15. The number of degree programs available in CDM positively influenced my decision to select CDM as my home college
    a. Yes
    b. No

16. When I enrolled at DePaul, my parents or other influential person(s) were aware of the number of degree programs available in CDM
    a. Yes
    b. No
    c. Don't know
17. Indicate which of the following factors influenced your decision to enroll at DePaul University. Mark as many as are applicable.
    a. The reputation of DePaul
    b. The fact that DePaul is a liberal arts college
    c. The reputation of the College of Computing and Digital Media (CDM)
    d. The breadth of degree programs at CDM
    e. A particular degree program at CDM
    f. Recommendations from relatives
    g. Recommendations from friends
    h. None of the above
18. If you selected none of the above in the previous question, please indicate what other factor or factors influenced your decision to enroll in CDM at DePaul.

3. ANALYSIS OF SURVEY DATA

As mentioned in the previous section, 296 first-year students over the age of 18 were asked by e-mail to complete the survey in January 2009. 103 responses were received for a response rate of 34.79%. In this section we analyze the survey data gathered from the initial study.

3.1 Demographics

Of the 103 responses, 24 were women and 79 were men. There were 51 women and 205 men solicited for the survey, the overall female response rate was higher than the male response rate at 47.05% versus 38.53%. There were 72 responses from freshman, with 19 female freshmen and 53 male freshmen. There were 33 female students and 145 male students in the freshman pool, so that the female freshman response rate was much higher than the male response rate at 57.57% versus 36.55%. There were 29 first-year transfer students responding, with 5 women and 24 men. There were 18 female first-year transfer students and 100 male first-year transfer students solicited, so that the female transfer student response rate was slightly higher than the male response rate at 27.77% versus 24%.

A vast majority of the respondents were of traditional college age. 40 students (13 female and 27 male) were 18 years old, 35 students (7 female and 28 male) were 19 years old, 8 students were 20 years old (2 female and 6 male), 6 students (all male) were 21 years old, and the remaining students were evenly distributed between 22 years of age and 40 years of age.

All but 3 of the respondents specified a major, with 27 majoring in digital cinema, 21 in computer game development, 12 in each of computer science and network technology, 7 in information assurance and security engineering, 6 in interactive media, 5 each in information systems and information technology, 2 each in animation and computer graphics and motion technology, and 1 in math and computer science. These numbers are representative of the CDM majors with the largest enrollments, since digital cinema is the largest major with 285 students, computer game development is second with 222 majors, and computer science is third with 182 majors. There were more respondents in network technology and interactive media than would be expected given that there are only 89 and 49 majors in those areas respectively, and information systems and animation were slightly underrepresented since there are 107 and 92 majors in those areas respectively.

3.2 Factors Influencing Recruitment

Of the 103 respondents, 86 (83.5%) indicated that they were interested in a major in computing or the digital arts prior to considering any college. Men and women indicated yes to this question at equivalent rates, with 20 (83.33%) women answering yes versus 66 (83.54%) men. This situation was very common for some majors. 100% of the animation, computer game development, and math and computer science majors indicated yes to this question. Very high percentages of selected other majors indicated yes, including 91.66% of network technology respondents, 88.88% of digital cinema respondents, 83.33% of interactive media respondents, and 80% of information systems respondents. It was less pronounced for the remaining majors, with 75% of computer science, 71.43% of information assurance and security engineering, 50% of computer graphics and motion technology and 60% of information technology respondents indicating yes.

91 respondents indicated that they knew they were interested in a major in computing or digital media prior to considering DePaul University which is 88.34% of the total. Again men and women responded in equal rates with 21 (87.5%) women and 70 (88.6%) men indicating yes to the question. As with the previous question, a yes on this question was more common among certain majors. 100% of animation, interactive media, information systems, and math and computer science majors, 95.24% of computer game development majors, 92.59% of digital cinema majors, 91.67% of network technology majors indicated yes to this question. Some groups of respondents indicated yes at a lower rate than the average with 85.71% of information assurance and security engineering majors, 83.33% of computer science majors, 60% of information technology majors, and 50% of computer graphics and motion technology majors indicating yes.

A large number of respondents were aware of the number of degree programs available in CDM at the time of application to DePaul University, with 83 (80.58%) indicating yes to this question. More men than women responded yes to the question, with 19 (79.16%) female and 64 (81%) male respondents. Again like the previous questions, a yes was more common among certain majors. 100% of animation, interactive media, information systems, and math and computer science majors, 85.71% of computer game development and information assurance and security majors, 83.33% of network technology majors, and 81.48% of digital cinema majors responded yes to this question.

A large majority of respondents indicated that the number of degree programs in CDM positively influenced their decision to apply to DePaul, with 75 (72.81%) indicating it was a factor. Unlike previous questions, more men than women felt that the number of degree programs had influenced their decision, with 16 (66.66%) women and 59 (74.68%) men indicating this. A yes was again more common among certain majors, with 100% of animation, interactive media, and math and computer science majors, 83.33% of network technology majors, 81.48% of digital

cinema majors, 80% of information systems majors, and 76.19% of computer game development majors responding yes.

Respondents were fairly evenly split about whether their parents had influenced their decisions about college with 55 (53.39%) indicating no and 48 (46.61%) indicating yes. Male and female responses were very similar with 13 (54.16%) women and 42 (53.16%) men indicating that their parents had not influenced their decision. Parents had more influence over students with certain majors. 100% of the computer graphics and motion technology and math and computer science majors, 66% of interactive media majors, 60% of information systems and information technology majors, and 58.33% of computer science majors were influenced by their parents with respect to college. Network technology majors showed a near complete lack of parental influence, with 75% of these respondents indicating that parents had no influence.

In response to the question asking whether someone other than a parent had influenced decisions about college, 63 (61.16%) responded no and 40 (38.84%) yes. Here more women (16 or 66.66%) than men (47 or 59.49%) responded no. Some majors were more influenced than others, with 100% of computer graphics and motion technology and math and computer science majors and 80% of information systems and information technology majors, and 66.67% of interactive media majors indicating that someone other than a parent influenced them. The difference seen in the previous question for network technology majors disappeared for this question, as 50% of those majors indicated yes to this question. Digital cinema majors were particularly not swayed by someone other than a parent, as 77.78% of them indicated no to this question. In the open-ended question that followed, 38 indicated that someone other than a parent had influenced their decision. 12 (10 men and 2 women) indicated relatives, 11 (7 men and 4 women) indicated friends, 4 (all male) indicated teachers, 3 (all male) indicated spouses, 2 (all male) indicated research, 2 (1 man and 1 woman) indicated high-school advising, and 1 each indicated advising, colleges, the Internet, and a tour guide.

In response to the question asking whether a parent or other influential person had been aware of the number of degree programs available at CDM when the student applied to DePaul, 38 (36.89%) indicated that they didn't know, 29 (36.7%) indicated no, and 36 (45.56%) indicated yes. More men than women (31 or 39.24% versus 7 or 29.16%) indicated that they didn't know, more women than men (9 or 37.5% versus 20 or 25.32%) indicated no, and roughly equivalent numbers indicated yes (8 or 33.33% female versus 28 or 35.44% male). No discernable patterns were found in the responses to this question by major. Similar numbers were obtained for the question asking whether a parent or other influential person had been aware of the number of degree programs available at CDM when the student enrolled in DePaul, with 39 (37.86%) indicating they didn't know, 20 (19.42%) indicating no, and 44 (42.7%) indicating yes. For this question the patterns by major are more interesting. A very small number of computer science majors (16.67%) indicated that influential people had been aware of the number of degree programs. On the other extreme, a very large percentage (66.67%) of network technology majors indicated yes on the question.

A majority of respondents indicated that the number of degree programs in CDM positively influenced their decision to enroll, with 71 (68.93%) indicating yes. This factor was more important for men (57 or 72.15%) than for women (14 or 58.33%). For some majors the number of degree programs was more important in deciding to enroll. 100% of animation, computer science, information systems, and math and computer science majors, 75% of network technology majors, and 70.37% of digital cinema majors indicated yes to this question.

An even larger number indicated that the number of degree programs positively influenced their decision to select CDM as their home college, with 75 (72.82%) indicating yes. Again the factor was more important for men (59 or 74.68%) than for women (16 or 66.66%). Again, the number of degree programs was more influential for some majors than others. 100% of animation, information systems, and math and computer science majors, 83.33% of interactive media and network technology majors, 80.95% of game development majors, and 74.07% of digital cinema majors indicated yes to this question.

The last two questions asked students to indicate which factors influenced their decision to enroll at DePaul University. There were 102 responses for this question. 72 (70.58%) indicated the reputation of DePaul as a factor, 13 (12.75%) indicated the fact that DePaul is a liberal arts institution, 9 (8.82%) indicated the reputation of CDM, 4 (3.9%) indicated a particular degree program, and only 2 (1.96%) indicated the breadth of degree programs at CDM. More interesting was the composition of majors in the responses. Computer game development and information assurance and security engineering majors made up all 4 responses for a particular major. Animation and interactive media majors were the only ones indicating that the breadth of degree programs was important. The fact that DePaul is a liberal arts institution was important to computer game development, digital cinema, interactive media, math and computer science, and network technology majors.

4. CONCLUSIONS

A number of results of the survey stand out. First, the higher female response rate is interesting, especially considering that the response rate was generally proportional to the size of the majors, with network technology and interactive media majors slightly overrepresented and information systems and animation majors slightly underrepresented.

A majority of respondents (> 80%) were already interested in technology or the digital arts prior to considering college or DePaul in particular, a result that is consistent with the previous literature which shows that student interest in a subject is paramount in choosing that major. Some majors had a greater awareness, including animation, computer game development, and network technology. These are highly specialized majors, which may explain the result. Similarly a majority (~80%) were already aware of the number of degree programs at CDM. More animation, interactive media, and information systems majors were aware of the breadth of degree programs than other majors.

As with previous work in this area, our results show that parents and other people were not a large factor in the decisions that students made. There were particularly strong negative results in this area for parents with respect to network technology and other

people with respect to digital cinema. The former result may be explained by a higher number of transfer students who major in network technology, making them generally older and less influenced by parents.

Clearly the strongest factor students mentioned for deciding to enroll at DePaul University was the reputation of the institution, a result that is very surprising given the lack of importance of institutional reputation in previous studies. The fact that DePaul is a liberal arts institution was important to computer game development, digital cinema, interactive media, and network technology majors. These majors can often be found in vocational or specialized institutions, and it makes sense that students who decided to come to DePaul over these institutions would be more likely to value a liberal arts focus. Particular majors were important only to computer game development and information assurance and security engineering majors, both of which are becoming nationally recognized specialized majors at DePaul. The breadth of degree programs was important only to animation and interactive media majors, perhaps because these majors are more interdisciplinary than other CDM programs.

Respondents did indicate that the number of degree programs was a positive factor for application (72%) and enrollment (69%) at DePaul, as well as for enrollment in CDM (72%). It was more influential for interdisciplinary and focused degree programs such as animation, interactive media, digital cinema, and network technology. This may also help to explain why DePaul CDM has continued to have strong enrollments even during difficult times, as interdisciplinary programs are more attractive to students interested in computing (Carter, 2006).

5. FUTURE WORK

While the response rate for this survey was good, only one class of students was queried. It would be very interesting to see if similar results are obtained for subsequent classes of incoming students. Work is currently underway to gather survey data from freshmen and first-year transfer students for the 2009 – 2010 academic year.

The analysis of this data included a separation by gender and by major. The results seem to suggest, however, that freshman and transfer students may consider different factors when making decisions about applying and enrolling in a college. It would be instructive to take both this data and the data from the 2009 – 2010 academic year and analyze each question separately for freshman and transfer students. It is worthwhile to wait for additional data to do this analysis since the size of the transfer student data set for 2008 – 2009 is somewhat small.

6. ACKNOWLEDGMENTS

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