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Investigating IS Student Retention Factors

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ABSTRACT

Student retention represents a continuous challenge that institutions attempt to address (Braxton, Bray, and Berger, 2000). In addition, the business community faces the problem of finding the talented workforce to fill the growing amount of open IT positions. In order to attract students to IT field, it is important to examine students' motivation in choosing a major and their retention intention. In this study we surveyed literature on student retention and consult faculty's view on IS enrollment issues. We contribute to the literature in the following ways: 1) develop IS student retention factors, 2) discuss the implication of IS student retention factors, 3) serve as a tool to assess IS students retention rate.

Keywords

Student retention, persistence, metrics, enrollment crisis, student success.

INTRODUCTION

Student retention is one of the more important issues facing higher education today. With one-third of college students dropping out of school each year, it is a topic universities across the country have noticed, but few have found a workable solution to the problem (Heldman 2008). Habley, Randy McClanahan (2004) surveyed all accredited, degree-granting, two-year and four-year, public and private colleges and their survey shows that only 48.7% of campuses have identified an individual responsible for coordinating retention strategies; 59.6% of campuses have established an improvement goal for retention of students from the first to second yea; and 45.6% of campuses have established a goal for improved degree completion. Despite the attention paid to college student retention there are inadequate efforts. Though research on student retention is fruitful, Tinto (2005a) suggests that more work needs to be done on developing a model of student persistence that can guide policy making, program and practices.

In the recent years, IS enrollment has experienced a worse downturn than overall student enrollment. Though many efforts are devoted to overall student retention study, the IS student retentions still under researched and publications remain a paucity. In this study we surveyed literature on student retention and consult faculty's view on IS enrollment issues. We contribute to the literature in the following ways: 1) develop IS student retention factors, 2) discuss the implication of IS student retention factors, 3) serve as a tool to assess IS students retention rate.

LITERATURE REVIEW

Our relevant literature review focuses on two bodies of research: IS enrollment crisis and student retention.

IS Enrollment Crisis

Between the mid-1990s into 2001, the IT market underwent a rapid growth spurt that created great demand for IT professionals. During that period, IT jobs were plentiful with more and more students enrolled in computer science and information systems programs. Students viewed IT as an important skill which would help them find a good paying job. After 2001, the dom com bubble burst and the practice of offshoring mushroomed. Thus, employment opportunities within all disciplines shrank but the IT field suffered even more (Akbulut and Looney 2007). Students were bombarded with the news of offshoring. The major offshoring movements of corporations along with the media reports contributed to students' growing perceptions of job scarcity in the IT field. As a result, enrollments in computer and technology-related majors have been in decline.

Challenged by the depressing enrollments, many scholars have come up with useful strategies addressing declining enrollments. Because the majority of students enrolled in the introductory IS courses have yet to make their decisions on majors, George et al. (2005) suggest targeting students in the introductory IS course as the potential pool for IS majors.

Various interventions strategies are developed such as exposing students to interesting and contemporary technologies, assigning effective teachers to introductory courses, and using peers to promote the rewards that arise from majoring in IS. They also state the continued success of the IS discipline depends upon the content, structure, resources, and tone employed in the introductory IS course. In line with what George et al suggested, Firth et al. (2008) examine the comprehensive set of steps that can be implemented in the introductory IS course to increase the number of students and attract quality of students entering the IS major. These twelve steps include: 1) assign the most effective teachers, 2) teach IS, not IT or CS, 3)use writings from non-IS authors to tell the IS story, 4) force the students to write and write and write, 5) expose the students to innovative and interesting technology, 6) recruit peers and alumni as guest speakers, 7) expose students to career and internship counseling, 8) provide sufficient levels of assistance to students, 9) provide opportunities for reflective growth, 10) identify and market to the top students, 11).be nimble, and ,12) focus on local strengths. Firth et al. (2008) show a proving and profitable 12-step program which results in the doubling of the number of IS majors.

Student Retention Factors

The literature uses various terms such as student departure, attrition, student persistence, and student retention to describe the results of student withdrawal from college. Braxton et al. (2006) define departure as decisions made by students to voluntarily leave their college or university. Student persistence and student retention measure the continued enrollment of students, usually fall to fall re-enrollment. Other measures include annual Spring-to-Fall reenrollment, full-time student return rates, semester-to-- semester persistence, or first-time freshman reenrollment.

Tinto has made significant contribution to retention research. As shown in figure 1, Tinto (1975) hypothesizes that retention is a process in which many factors interact to influence students' dropout decision. In Tinto's model, students' family background, individual attributes, and pre-college school affects goal commitment and institutions commitment. Academic and social integration affect students' dropout decisions influence students' dropout decision. Students change their commitment when they are within the academic and social system. If students do not find a fit between themselves and the university, they are likely to withdraw from the college life.

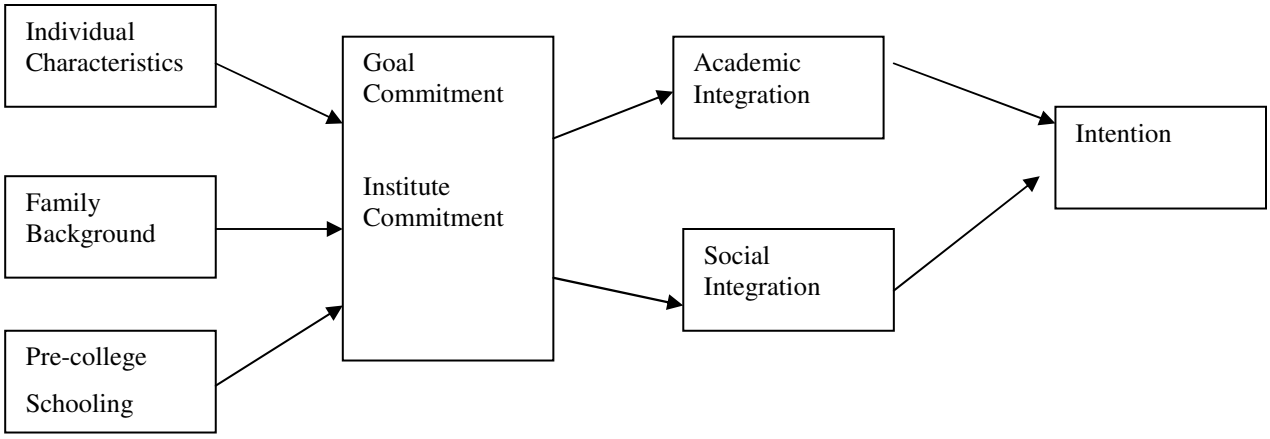

Figure 1. Revised Tinto's Model (1975)

Tinto's retention theory has had a profound impact on retention studies. Many studies use Tinto's theory (1975) to investigate student retention issues. Terenzini et al. (1981) tested Tinto's model and their results generally supported the predictive validity of the major dimensions of the Tinto model (Tinto, 1975). The Institutional and Goal Commitment Scale proved a significant predictor of attendance behavior even after controlling for a variety of students' precollege characteristics. Potential institutional differences in faculty members' influence on retention were identified. A cross-validation classification procedure suggests the five factors are reasonably stable predictors of attrition. The most notable finding from their study is the strong contributions of student-faculty relationships as measured by interactions with faculty and the faculty's concern for student development. Students that remained in college reported significantly higher scores in both relationships than those students who left college voluntarily. Bean (1985) introduced a model that has similarity with Tinto (1975). Bean states that socialization is a dominant force in influencing dropout decisions. Peer influences have a much greater effect on the attitudes

of students than do faculty members. This finding suggests that peer support can be effective in student retention and informal faculty interaction with students could have little impact on student attrition rate.

Individual Characteristics

Many studies examine the role of students background characteristics on success, however, no clear answers have emerged (Braunstein 1997; Caison (2007). McGrath and Braunstein (1997) report that voluntary college dropouts had lower academic preparation, more financial problems, and lower socioeconomic status than those who remained in school. Caison (2007) concludes that the independent variables drawn from institutional databases out-perform variables drawn from the institutional integration survey scale developed by Pascarella and Terenzini (1980). Though prior findings show that the model using only the database variables (i.e., high school GPA, SAT scores, instate residency, and total hours carried in the first semester) collected by most postsecondary institution is inferior to Pascarella and Terenzini's (1980) Institutional Integration Scale, the addition of other commonly available variables such as parents' educational background, certainty of major, and intention to work in the first semester (among others) improve predictive power for retention.

Personal

Heldman (2008) find that personal rather than academic difficulties are the major reason for student leaving universities. Success in solving personal problems has the potential to retain more students. Heldman(2008) suggest that assessment and on-going coaching are the key steps to improve its student retention statistics and the experience. Kelly et al. (2007) report that students personal problems fall into the following areas: attitudinal, social, family, health, employment, financial, and academic. Davig and Spain (2004) report non-returners stated family problems, job conflict, and financial problems as important reasons for not re-enrolling.

Psychological Variables

Tracey and Sedlacek (1989) consider the importance of psychological variables in student retention. They develop the Noncognitive Questionnaire assessing psychosocial aspects that affect college success. Their questionnaire covers the following dimensions: personal goals, college expectation, academic self-concept, self-appraisal system, leadership experience and community service in high school, knowledge acquired in a field, ability to understand and cope with racism, and availability of a strong support person. Astin (1975) concluded that students' involvement in college life is a significant factor contributing to student persistence. "Quite simply, student involvement refers to the amount of physical and psychological energy that the student devotes to the academic experience" (Astin, 1984, p. 297). "It is not so much what the individual thinks or feels, but what the individual does, how he or she behaves, that defines and identifies involvement" (p. 298).

RECRUITMENT OF STUDENTS

Colleges have developed various strategies to recruit prospective students. In Texas, some colleges used big buses traveling to Texas high schools, shopping malls and low-income neighborhoods to recruit underserved students to college (Recruit and Retention 2006). (*Recruitment & Retention in Higher Education*, 2004). Technologies can help admission officers of universities in attracting prospective enrollees. Communicating with the young people via virtual and human ways is essential in capturing their attention and interest. Orrell (2008) suggest several technology related strategies in recruitment, such as storing college's information on flash drives, making a podcast or videocast, hosting webinars for questions and answers, creating a "Second Life" community, launching text-message campaigns, and building a presence on YouTube, Facebook or MySpace. Harris (2008) discusses the benefits of using social networking sites (SNS) for communication between college students and teachers. SNS is helpful in recruiting students and assisting low-income and minority students to develop technology skills.

RENTENTION MODEL

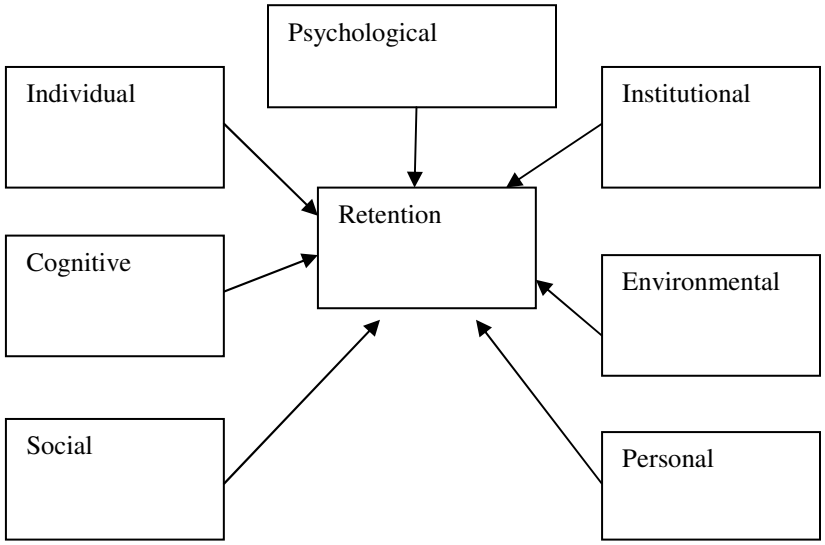

Figure 2. Research Model

Because retention has been a persistent issue for all universities and colleges, many useful results have been published. It seems appropriate to build on prior work on student retention to develop IS student retention metrics. After an extensive literature search on student retention in general and IS student enrollment issues in particular, it can be observed and stipulated that both academic and non-academic influences affect college student retention and performance (Kelly et al. 2007). Table 1 below shows factors and their suggested measures. Figure 2 attempts to integrate prior research on student retention and develop a conceptual retention model.

DISCUSSION

There are many factors that contribute to students dropout decisions. The retention model presented here attempts to synthesize relevant factors from prior fruitful findings of student retention, such as conventional variables (demographics and academic and social integration variables), along with the environmental, personal and institutional factors with IS specific measures. Individual characteristics include the traditional demographic variables and their experience with IS/IT at high school. For example, if students took technology related classes at high school, this prior experience affects their decisions on majors in college. Institutional characteristics emphasize this experience and give credit for the importance of computer labs, hardware and software on students IS major selection. Cognitive factors include students' interests in IS courses and IS/IT aptitude and their intention to participate in IS/IT curriculum activities/events. Environmental factors considers the impact of IT offshoring news and IT job opportunities on students. Other variables incorporated into the model include attending IT job fairs and speeches offered by IT professionals which has also proven to influence students' major decision. Psychological factors use self-reported factors such as enjoyment and involvement to assess how students feel and think about IS topics, courses, advising, counseling, and engagement.

University administrators and researchers continue to look for a better understanding of why students in general leave college. Tinto (2005b) suggests a focus on the five research conditions (Institutional commitment, expectations, support, feedback, involvement) that will likely make students more successful. Our model of IS student retention encompass these five Tinto-recommended dimensions. Using and monitoring these retention factors and measures, we can identify top students as well as students at risk. Institutions are able to better target students and develop strategies to retain students. Ideally, programs would like to both, enroll quality students and, at the same time, address the concerns and problems of at-risk students so as to help them succeed in their college education.

With average retention rates hovering around 68 percent at four-year colleges and universities, it is imperative to act upon retention (Heldman 2008). Because of heavy case loads, colleges need efficient ways to identify students at-risk. The retention model presented here offers a way to encapsulate previous research into a paradigm to help college administrators and counselors with enrollment management. The IS-specific measures in our instrument accentuate the importance of IS department in enrolling IS majors. Obviously, IS departments should partner with advising and counseling centers to explore other issues students have with IS program retention and develop strategies to attract majors.

IS Student Retention Factors

Factors	Measures
Individual Characteristic	Gender SAT Verbal and SAT Math High School GPA Mother's education and Father's education Mother's occupation and Father's occupation
Institutional Characteristic	Expose students to IT career and internship counseling an institution's computer and technology capabilities Financial aid
Cognitive	interests in other IS courses IT/IS Aptitude intention to participate in IT co-curricular activities
Social	Attitude toward learning IS/IT Attitude toward IT/IS profession Social integration Peer influence and Family influence
environmental factors	News on IT job opportunity financial support frequency of IS job fairs member of IS student groups Recruiting peers and alumni as guest speakers
Psychological	Enjoying IS/IT subject(s) Involvement in IT/IS
Personal	Job conflict Health issues Family issues Financial issues

Table 1. Retention Factors

CONCLUSION

Student retention represents a continuous challenge that institutions of higher learning continue to address (Braxton, Bray, and Berger, 2000). In addition, the business community faces the problem of finding the talented workforce to fill the growing amount of open IS/IT positions. In order to attract students to IS/IT field, it is important to examine students' motivation in choosing a major and their retention intention. Understanding reasons for dropout is essential for building a valid model on student retention. Traditionally, retention models use variables such as demographic and academic variables to predict the likelihood of student success. In this meta analysis we consolidate factors for student retention by integrating IS literature and generic retention literature. The next step is to collect data from freshmen and sophomore to validate our factors. In order for the retention program to be effective, retention efforts must emphasize these different factors. As our model portrays, retention is a complex issue and diverse retention programs should be created to meet the different needs of

students. Furthermore, effective retentions programs should be based on each institution's unique set of characteristics and the student bodies' characteristics.

REFERENCES

1. Akbulut, A. Y. and C. A. Looney. (2007). Inspiring Students to Pursue Computing Degrees : Their Aspirations Are Our Possibilities, *Communications of the ACM* , 50, 10, 67-71.
2. Archer, J. Jr. and Cooper. (1999) An initiator-catalyst approach to college counseling outreach, *Journal of College Counseling*, 2, 76-88.
3. Astin, A. W. (1984). Student involvement: A developmental theory for higher education. Journal of College Student Personnel, 25, 297-308.
4. Barefoot, B. S. (2004) Higher education's revolving door: confronting the problem of student drop out in US colleges and universities, *Open Learning*, 19, 1, 9-18.
5. Braxton, J. M., Bray, N. J., & Berger, J. B., (2000). Faculty teaching skills and their influence on the college student departure process. Journal of College Student Development, 41, 215-227.
6. Caison, A. L. (2007) Analysis of institutionally specific retention research: A comparison between survey and institutional database methods, *Research in Higher Education*, 48, 4, 435-451.
7. Coll, K. M. and Stewart, R. A. (2008) College student retention: Instrument validation and value for partnering between academic and counseling services, *College Student Journal*, 42, 1, 41-56.
8. Community Colleges Recognized for Aiding Underserved Students. Recruitment & Retention in Higher Education, Jun2004, Vol. 18 Issue 6, 4-4.
9. Firth, D., Lawrence, C. and Looney, C. A. (2008) Addressing the IS enrollment crisis: A 12-step program to bring about change through the introductory IS course, *The Communications of the Association for Information Systems*, 23, 2, 17-36.
10. George, J. F., J. S. Valacich, and J. Valor. (2005). Does Information Systems Still Matter? Lessons for a MaturingDiscipline, *Communications of the AIS* (16), 219-232.
11. Goenner, Cullen F.; Pauls, Kenton. (2006). A Predictive Model of Inquiry to Enrollment.. Research in Higher Education, Dec2006, Vol. 47 Issue 8, p935-956,
12. Habley, W. R. and McClanahan, R. (2004) What works in student retention? Four-Year Public Colleges, ACT.
13. Harris, K. Using Social Networking Sites as Student Engagement Tools. Diverse: Issues in Higher Education, 10/16/2008, 25, 18, 40-40.
14. Heldman, C. (2008) Looking at the costs of student acquisition and attrition, *Recruitment & Retention in Higher Education*, 22, 5, 6-7.
15. June, A. W. (2006) Facilities play a key role in students' enrollment decisions, study finds, *Chronicle of Higher Education*, 52, 40, A27.
16. Kelly, J. T., Kendrick, M. M., Newgent, R. A. and Lucas, C. J. (2007) Strategies for student transition to college: A proactive approach, *College Student Journal*, 41, 4, 1021-1035.
17. McGrath, M. and Braunstein, A. (1997) The prediction of freshmen attrition: An examination of the importance of certain demographic, academic, financial, and social factors, *The College Student Journal,* 31*,* 396-408.
18. Orrell, Lisa. (2008). Recruitment Renovation: How to Enroll Your Fair Share of the Millennial Generation. By: Recruitment & Retention in Higher Education, 22, 2, 3-6.
19. Pascarella, E. T. (1980) Student-faculty informal contact and college outcomes, *Review of Educational Research*, 50, 545-595.
20. Recruiting the Underserved To College. Diverse: Issues in Higher Education, 1/25/2007, Vol. 23 Issue 25, p11-11.
21. Snyder, Thomas D., Tan, A. G., and Hoffman, Charlene M. (2004). Digest of Education Statistics 2003. Washington DC: U.S. Department of Education, Institute of Education Sciences. Sorenson, Knut et al. (2003). Case studies
22. Terenzini, P. T., Lorang, W. G., Pascarella, E. T. (1981) Predicting freshman persistence and voluntary dropout decisions: A replication, *Research in Higher Education*, 15, 2, 109-127.

23. Text Messaging to Prospective Students. Recruitment & Retention in Higher Education, Jun2006, Vol. 20 Issue 6, p1-2.
24. Thibodeau, P. Tech jobs forecast: Mostly gloomy, with some bright spots. http://www.computerworld.com/action/article.do?command=viewArticleBasic&articleId=333469. Accessed Feb. 19, 2009.
25. Tinto,V. (1975) "Dropout from Higher Education: A Theoretical Synthesis of Recent Research" *Review of Educational Research*, 45, 89-125.
26. Tinto, V. (1990) Principles for effective retention, *Journal of the Freshman Year Experience*, 2, 1, 35–48.
27. Tinto, V. (2005a) Forward. in Seidman, A. (Ed) *College student retention: Formula for student success*, Westport, CT, USA, American Council on Education/Praeger, ix-x.
28. Tinto, V. (2005b) Reflections on retention and persistence. Institutional actions on behalf of students' persistence. *Studies in learning. Evaluation, innovation and development*, 2, 3, 89-97.
29. Tracey, T. J. and Sedlacek, W. E. (1984) Noncognitive variables in predicting academic success by race, *Measurement and Evaluation in Guidance,* 16, 171-178.
30. Tracey, T. J. and Sedlacek, W. E. (1989) Factor structure of the noncognitive questionnaire: Revised across samples of
31. Yorke, M. (1998) Non-completion of undergraduate study: some implications for policy in higher education, *Journal of Higher Education Policy and Management*, 20, 2, 189-201.
32. Zhang, P. and Bhattacharyya, S. (2008) Students' views of a learning management system: A longitudinal qualitative study, *The Communications of the Association for Information Systems*, 23, 20, 351-375.
33. Zhang, W. (2007). Why IS: Understanding Undergraduate Students' Intentions to Choose an Information Systems Major. Journal of IS Education, 18, 4, 447-458.
34. 2007 Employment ForecasT, by Vedior, 2006.