Student engagement and course registration methods as possible predictors of freshman retention

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Abstract

A study by Kenney, Kenney, and Dumont (2005) identified a supportive learning environment as one of the five indicators for collegiate student engagement, a concept that extends beyond the classroom to permeate the entire educational environment. A student's level of engagement can be impacted as early as orientation and registration, when he is experiencing college for the first time and forming initial impressions of and relationships with university faculty and staff. Persistence of a student at a particular institution is measurable, and this persistence to the completion of an educational goal is a "key indicator of student satisfaction and success" (Levitz et al., 1999, p. 31). By proxy, then, student retention is a primary gauge for assessing an institution. In particular, it is important to identify that while retention's primary elements are academic, tactical, and operational, areas like course registration should be evaluated alongside the academic aspects (Dolence, 1991). Howard and Rogers (1991) strongly recommend the use of a longitudinal tracking system that has the ability to identify cohorts of students and succinctly track and analyze their academic progress. This pilot study utilized a conceptual framework based on Bean and Metzner's (1985) model of nontraditional-student attrition to determine if changes in academic success could be identified between two fall first-time freshman cohorts. The findings of this pilot study recognized a marked increase in academic success of those students in the test cohort, thereby confirming the importance of student engagement in the course registration process as a predictor of retention.

Keywords: retention, engagement, freshman, registration, advisement, constructivism

INTRODUCTION

Student Retention

Retention is defined as "the maintenance of a student's satisfactory progress toward his or her pedagogical objective until it is attained" (Dolence, 1991, p. 9). Enhancing student retention, particularly with regard to first-time freshmen, is a significant trend in contemporary American colleges and universities (Cueso, 2005; Dolence, 1991; Hossler, 1991; Jones & Conway, 2011; Levitz, Noel, & Richter, 1999; Sanders & Burton, 1996; Sandler, 2010). Orientation programs, specialized academic advisement, and student success initiatives are being developed and reconditioned across the country in all levels of higher education. As these platforms advance, so does the need to implement efficient models of research, assessment, and application of retention practices. In particular, it is important to identify that while retention's primary elements are academic, tactical, and operational, areas like course registration should be evaluated alongside the academic aspects (Dolence, 1991).

Attrition of college students could be the effect of multiple variables, not just academics (Dolence, 1991; Levitz & Hovland, 1998). Therefore, it is important to determine whether or not the administrative processes involved in registration have a direct negative impact as Levitz and Hovland (1998) have implied. In fact, in a recent Noel-Levitz student-satisfaction survey reviewing student services, campus life, and institutional responsiveness, the ability to register for necessary classes ranked fourth in importance for students, while it only ranked tenth in importance for campus personnel (2011a, pp. 2-3). This ranking disparity underscores the need for university administrations to recognize the needs of their students and modify their priorities accordingly. Furthermore, as Dolence (1991) has claimed, "the most important prescription for effective student retention is cooperation and collaboration between the academic and student affairs areas" (p. 16). With positive results documented by substantial research, an institution would be hard-pressed to ignore the retention connection between academics and administrative practices. Such data could provide the missing link among institutional policies and procedures, and therefore potentially spur change in the university's focus on general retention.

Student Engagement

Students demonstrate their levels of engagement through a variety of academic behaviors. According to Skinner and Belmont (1993), highly engaged students show sustained behavioral involvement in learning activities that are accompanied by a positive emotional tone. They select tasks at the border of their competencies, initiate action when given the opportunity, and exert intense effort and concentration in the implementation of learning tasks; they show generally positive emotions during ongoing action, including enthusiasm, optimism, curiosity, and interest. (p. 572)

A study by Kenney, Kenney, and Dumont (2005) identified a supportive learning environment as one of the five indicators for collegiate student engagement, a concept that extends beyond the classroom to permeate the entire educational environment. A student's level of engagement can be impacted as early as orientation and registration, when he is experiencing college for the first time and forming initial impressions of and relationships with university faculty and staff.

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A private school for 83 years, the University of Chattanooga merged with one of the country's oldest land-grant universities in 1969 to form the Chattanooga campus of the University of Tennessee (UTC). In the spring 2012 semester, UTC enrolled a total of 10,426 undergraduate and graduate students, 20.8% of whom were freshmen (N = 2,169).

For UTC, defining and improving student engagement began formally in 2005 with the creation of a Quality Enhancement Plan (QEP). Dr. Vicki Steinberg, chair of UTC's QEP planning team, said the purpose of the process was to provide the best education for the university's students, which "must begin with an understanding of what it means to be engaged in learning—how to be engaged in the community—how to be engaged in the world, past, present, and future" (UTC, 2005, para. 2). Steinberg's desire coincides with UTC's institutional vision, mission, and core values, all of which stress the need for student engagement to extend beyond the university and into the community. Achievement of these tenets not only ensures that students get the most out of their education but also creates the foundation for them to be successful post-graduation (Shulman, 2002).

UTC students assist the university in its quest to define engagement by participating in the National Survey of Student Engagement (NSSE), an annual assessment of collegiate quality that is funded through the Pew Charitable Trusts. According to NSSE, student engagement is indicative of two factors of collegiate quality: first, how much time and effort students put toward their education, and second, "how the institution deploys its resources and organizes the curriculum and other learning opportunities to get students to participate in activities that decades of research studies show are linked to student learning" (NSSE, 2011, para. 1). In other words, student engagement is the responsibility of both the student and the university.

For the ten-year span from 2000 to 2009, UTC averaged a 66.8% freshman retention rate, with 68% of students returning for their sophomore term in Fall 2009 (UTC, 2011b). This compares to the national freshman retention rate of 76% for American higher education institutions during the same academic year (National Center for Higher Education Management Systems, 2009).

BACKGROUND

Because of the need for active involvement on the part of the learner, cognitive and experiential learning theorists such as Piaget (1970), Bruner (1964), and Vygotsky (1962) often provide the basis for student engagement strategies. Vygotsky, for example, believed that environmental interactions can lead to success in learning, which has implications not only for student engagement in classroom environments but also in the larger environment of the university. Studies that connect active student engagement with higher achievement support this theory (Greene & Miller, 1996).

Skinner and Belmont's (1993) characteristics for highly engaged students also demonstrate a direct correlation with Vygotsky's (1978) zone of proximal development, in which students select tasks at the border of their competencies. The keyword here may be "choice;" suggesting that students may not always take advantage of the opportunities they are given, although Zimmerman's (1989) concept of self-regulation insists that students have some choices available to them. These choices provide the students with a degree of control over their learning environments, which keeps them motivated toward achieving their goals. This certainly

plays a part in course selection, which sets the stage for a student's college experience for at least a semester and perhaps longer.

The theory of engagement (Schlechty Center for Leadership in School Reform, n.d.) posits that the design of school tasks and activities, such as registering for classes, introduces variances into the learning process that ultimately affect the level of effort students are willing to expend on the tasks. If it is difficult or frustrating to register for courses, students may lose interest and simply take whatever schedules they can get, which could result in a dissatisfying semester. For students who are not very motivated or engaged, this could spell the end of their college careers.

Because constructivism emphasizes each learner's individuality and unique needs (Piaget, 1970; Bruner, 1964; Vygotsky, 1962), it is logical for universities to customize the registration process as much as possible for each student while still maintaining overall efficiency and effectiveness. This ideal follows the construct of developmental academic advising outlined by Crookston (1972), which takes into consideration not only a student's vocational aspirations but also his interpersonal and environmental interactions with the school and its faculty and staff.

Student attrition is costly to an institution, both in expenditures of recruitment and academic resources. As such, an institution should make retention programs a top priority, thereby encouraging student decisions to persist (Dolence, 1991; Hossler, 1991). There is research that supports the need to integrate these programs into a campus's strategic planning process, as this lack of coordination is considered a primary reason for an institution's operational failures (Dolence, 1991; Hossler, 1991). Persistence of a student at a particular institution is measurable, and this persistence to the completion of an educational goal is a "key indicator of student satisfaction and success" (Levitz et al., 1999, p. 31). By proxy, then, student retention is a primary gauge for assessing an institution. A student who has a bad experience in college is likely to share that experience with others, thereby tarnishing the institution even further (Levitz et al., 1999).

Dolence (1991) defines retention as "the maintenance of a student's satisfactory progress toward his or her pedagogical objective until it is attained" (p. 9). Substantial research has been done in the area of student retention in higher education over the past two decades, with a strong focus on entering college freshmen (Cueso, 2005; Dolence, 1991; Hossler, 1991; Jones & Conway, 2011; Levitz et al., 1999; Sanders & Burton, 1996; Sandler, 2010). In particular, a considerable number of studies have focused on the importance of orientation programs, personal academic advisement, and on-going student success initiatives. At the same time, institutional administrators themselves have been vocal about the need for stronger partnership and consensus among faculty, staff, and senior management concerning retention issues (Noel-Levitz, 2011b).

From a different perspective, Kamanetz (2010) acknowledges the need to address dissonance between "college for all" and other accelerated educational opportunities. Kamanetz indicates that once the early steps are simplified, a continued focus on institutional efficiency can assist in cutting down time-to-degree. Streamlining the process is a substantial need, as the lack of knowledge in navigating the system is a primary barrier to access. Orientation programs assist in the basic navigation, but the amount of information provided during these typically fast-paced and highly-stressful introductions can be overwhelming to a new student.

Similarly, Gold and Friedman (2000) provided the notion of anticipatory stress in military cadets, or stress that is prompted by future stressors and the fear of the unknown. This

concept has been further linked to the anxiety of incoming college students, with suggestions that anticipatory stress could be greatly reduced by providing these students with additional knowledge of the university system and a dropout prevention plan (Earnest & Dwyer, 2010; Levitz et al., 1999). In particular, Levitz et al. (1999) proposed that "intrusive, proactive strategies must be used to reach freshmen" before the students have a chance to turn negative (p. 39).

CONCEPTUAL FRAMEWORK

Howard and Rogers (1991) strongly recommend the use of a longitudinal tracking system that has the ability to identify cohorts of students and succinctly track and analyze their academic progress. In light of the aforementioned importance of retention and methods to engage students at the university level, the researchers organized a pilot study. This pilot study utilized a conceptual framework based on Bean and Metzner's (1985) model of nontraditional student attrition to determine if changes in academic success could be identified between two fall first-time freshman cohorts. While Bean and Metzner evaluated six background and defining variables, four environmental variables, three social integration variables, and six academic variables, this pilot study only evaluates one academic variable – the method of first-time registration. In terms of outcomes, Bean and Metzner identified one academic outcome and four psychological outcomes. Instead, this pilot study identified five academic outcomes for the first fall semester. These five variables included semester GPA, semester-attempted credit hours, semester-earned credit hours, academic standing, and retention from fall to spring. Later studies will examine additional academic outcomes and further retention data.

This pilot study aimed to examine two cohorts of entering freshmen as they progress through the initial course registration process as part of Freshman Orientation, then through one complete academic semester. Both cohorts were registered in their courses in a different manner; the first cohort (2010 Baseline Comparison Group) manually registered themselves in courses that were available at the time of their Orientation session. The second cohort (2011 Comparison Group) was assigned a course schedule based on their successful completion of an Academic Interest Questionnaire (AIQ; Figure 1, Appendix A) prior to Orientation, and many course sections were purposely restricted to their cohort's enrollment. The pilot study compared the two cohorts to identify if the initial method of registration impacted their rate of academic success and retention from the fall to spring semesters. For example, academic success would be determined by an increase in the average semester GPA and a greater percentage of students with Good academic standing versus Probation academic standing. Conversely, an increase in the percentage of freshman students returning for the spring semester would be considered a positive retention result.

FINDINGS

For each fall semester examined, the extant student academic-history data were extracted from the Ellucian Banner student-information system and then converted into an Excel spreadsheet for further evaluation. Of 1,940 members in the 2010 Baseline Comparison Group, the average semester GPA was a 2.70, with an average of 14.30 semester credit hours attempted and 10.99 semester credit hours earned. 78.7% of the 2010 Baseline Comparison Group earned a

Good semester academic standing (i.e., a GPA ≥ 2.00), with 91% of the group retained until the following spring semester.

The 2011 Comparison Group was comprised of 2,177 students with an average semester GPA of 2.74 – an increase of 0.04 over the 2010 cohort. The semester-attempted credit hours for this group averaged 14.30 like the 2010 group, while the semester-earned credit hours improved to 11.27 over the 2010 cohort's 10.99. The frequency of students that achieved a Good semester academic standing reached 80.5%, and the frequency of students retained until the following spring semester equaled 91.5%. These 2011 cohort outcomes displayed positive increases of 1.8 and 0.5 percentage points, respectively, over the 2010 counterpart group.

Following this initial data evaluation, the data were imported into the Statistical Package for the Social Sciences (SPSS), Version 20.0 (SPSS, 2011). The student cohorts (2010 or 2011) were designated as the independent variables based on the student's course registration method. The dependent variables were comprised of the previously noted semester-attempted hours, semester-earned hours, semester academic standing, and retention from fall to spring. The semester academic standing results were coded according to GPA: (1) if the GPA was greater than or equal to 2.00; (2) if the GPA was less than 2.0. Similar coding was designated for the spring retention; the students that were retained were coded as (1), while the students that were not retained had a designation of (2).

The extant data were evaluated as a bivariate correlation, as the researcher observed the students' academic outcomes without directly manipulating the processes and attempted to determine the degree of relationship between each of the registration groups and their individual corresponding variables (Field, 2011). The hypothesis for this pilot study was directional because it was assumed that a positive correlation would be identified. As such, the bivariate correlation was processed as a one-tailed test in SPSS. The data were evaluated with the assistance of Pearson's correlation coefficient, since the data were expected to be interval and normally distributed. Additionally, the strength and relationship between the cohort assignment and fall semester GPA were evaluated. These data were examined using the point-biserial correlation coefficient, because there was a continuum between the variable and the dichotomy. Specifically, while the cohort assignment would remain constant, the fall semester GPA could range between 0.00 and 4.00.

The results of the data, as demonstrated in Tables 1 and 2 (Appendix B), display the relationship between spring retention and fall semester GPA, earned hours, and academic standing. While both cohort groups had significant relationships in these three pairings, the significance in the 2011 Comparison Group was more than the relationships of the 2010 Baseline Group. For example, a review of spring retention and fall semester GPA recognized that the significance of the 2011 Comparison Group was .341, while the matched correlation for the 2010 Baseline Group was only .302. The correlations between spring retention and fall semester-earned hours for the 2011 Baseline Group and 2010 Comparison Group were .324 and .283, respectively. Furthermore, the difference between spring retention and fall academic standing was .032, with the 2010 Baseline Group at .213 and the 2011 counterpart at a more significant .245.

IMPLICATIONS AND POSSIBLE EXTENSIONS

It is understandable that the risk for attrition is increased when a student has difficulty finding or committing to long-term academic goals (Cueso, 2005). Thus, lower dropout rates

will be realized if adequate freshman support is provided with orientation, advisement, and other academic programs (Levitz, et al., 1999). Institutions should be proactive with their support programs and anticipate student difficulties, as the best way to stimulate student retention is to eradicate problems before they begin (Cueso, 2005; Noel-Levitz, 2011c). In particular, first-year students' academic decision making may be improved with dynamic institutional interventions at the forefront, rather than "passively offering programs and hoping that students will come to take advantage of them on their own accord" (p. 43).

Levitz, et al. (1999) proposed that immediate individualized approaches to retention may deliver substantial results almost immediately, often by concentrating on students whose traditional cognitive performance does not otherwise indicate that they are at risk. While this type of effort is being performed, a highly structured longer-term approach may be developed by a retention task force, hence portraying the retention program as an institution-wide priority (Dolence, 1991; Levitz, et al., 1999). Furthermore, this effort will assist the institution's leaders in articulating to their communities the responsibility that they assume on behalf of the students' persistence and retention rates (Arum & Roksa, 2011). It is critical however, that this task force acknowledge the importance of cooperation and collaboration among academic and student affairs divisions, because a lack of solidarity when attempting retention programs is considered one of the main reasons for strategic and operational disappointments (Dolence, 1999; Hossler, 1991).

While strategic elements of retention are purely academic, and not administrative, the administrative aspects should be evaluated along with tactical and operational areas like course registration and billing, as complications in these areas are common reasons to drop out (Dolence, 1999; Levitz & Hovland, 1998). Exemplary student-retention programs, in relation to Tinto's Interactionalist Model of Student Persistence, link retention initiatives with other institutional strategies to increase student gains toward educational goals (Braxton, Hirschy, & McClendon, 2004). Furthermore, "programs must consider individual needs to be effective" (p. 54). Petschauer and Wallace (2005) recommend a personalized approach to course registration, similar to the method being evaluated in the current study. Specifically, Petschauer and Wallace note that the frustration of developing course schedules during Orientation creates unnecessary anxiety and wastes energy during the first critical, face-to-face academic conversation that a student may experience. They further reference a common issue regarding the lack of course and seat availability: this type of problem should be negotiated with departments daily as opposed to being reactionary during freshman orientation. By appearing to wait until the last minute to make decisions and solve resource problems, institutions could be sending negative messages to the students.

CONCLUSION

The data collected and evaluated, as well as the detailed literature review provided, supports the theory that effective retention efforts and promoted student engagement can have a positive impact on a university and its students. Successful retention initiatives can influence a student's decision to persist at a particular institution, which in turn provides measurable indicators of student satisfaction (Hossler, 1991; Levitz et al., 1999). Student retention itself is a primary gauge for assessing the success of students, and by proxy, the institution, as there is a strong empirical relationship between a student's level of satisfaction with a university and his or her retention there (Levitz et al., 1999; Noel, Levitz, & Saluri, 1985). Happy, satisfied students

are free advertising, and reducing dropouts increases full-time equivalents and overall institutional revenue (Levitz et al., 1999). In contrast, attrition has the consequences of negative financial and image implications for the institution, as a student dissatisfied with his or her experience and either unable or unwilling to engage with his or her university will project a negative influence on other potential students.

BIBLIOGRAPHY

Arum, R., & Roksa, J. (2011). *Academically adrift: Limited learning on college campuses*. Chicago, IL: The University of Chicago Press.

Bean, J. P., & Metzner, B. S. T. Y. (1985). A conceptual model of nontraditional undergraduate student attrition. *Review of Educational Research, 55*(4).

Braxton, J. M., Hirschy, A. S., & McClendon, S. A. (2004). Understanding and reducing college student departure. *ASHE-ERIC higher education report, 30*(3).

Bruner, J. S. (1964). The course of cognitive growth. *American Psychologist, 19*, 1-15.

Crookston, B. B. (1972). A developmental view of academic advising as teaching. *Journal of College Student Personnel, 14*(2), 5-9.

Cueso, J. (2005). "Decided," "undecided," and "in transition": Implications for academic advisement, career counseling, and student retention. In R. S. Feldman (Ed.), *Improving the first year of college: Research and practice* (pp. pp. 27-48). Mahwah, NJ: Lawrence Erlbaum Associates.

Dolence, M. G. (1991). Setting the context for evaluation of recruitment and retention programs. *New directions for institutional research, 70*(2), pp. 5-19.

Earnest, D. R., & Dwyer, W. O. (2010). In their own words: An online strategy for increasing stress-coping skills among college freshmen. *College student journal, 44*(4), pp. 888-900.

Field, A. (2011). *Discovering statistics using SPSS* (3rd ed.). London: SAGE Publications Ltd.

Gold, M. A., & Friedman, S. B. (2000). Cadet basic training: An ethnographic study of stress and coping. *Military medicine, 165*(2), pp. 147-152.

Greene, B. A., & Miller, R. B. (1996). Influences on achievement: Goals, perceived ability, and cognitive engagement. *Contemporary Educational Psychology, 21*(2), 181-192.

Hossler, D. (1991). Evaluating recruitment and retention programs. *New directions for institutional research, 70*(2), pp. 95-99.

Howard, R. D., & Rogers, B. H. (1991). Tracking academic progress within a complex academic environment. *New directions for institutional research, 70*(2), pp. 61-72.

Jones, G., & Conway, C.S.D. (2011). Benefits and challenges facing students working in a group for a freshman-level course. Retrieved from http://www.eric.ed.gov/ERICWebPortal/detail?accno=ED518814

Kamenetz, A. (2010). *DIY U: Edupunks, edupreneurs, and the coming transformation of higher education*. White River Junction, VT: Chelsea Green Publishing Company.

Kenney, D. R., Dumont, R., & Kenney, G. (2005). *Mission and place: Strengthening learning and community through campus design*. Westport, Connecticut: Praeger Publishers.

Levitz, R., & Hovland, M. (Eds.). (1998). *Dropout prone students*. Iowa City, IA: Noel-Levitz.

Levitz, R. S., Noel, L., & Richter, B. J. (1999). Strategic moves for retention success. *New directions for higher education, 108*(4), pp. 31-49.

National Center for Higher Education Management Systems. (2009). Retention rates: First-time college freshmen returning their second year, four-year total – 2009. Retrieved from http://www.higheredinfo.org/dbrowser/index.php?submeasure=223&year=2009&level=nnatio&mode=map&state=0

Noel, L., Levitz, R., & Saluri, D. (Eds.). (1985). *Increasing student retention: Effective programs and practices for reducing the dropout rate*. San Francisco, CA: Jossey-Bass.

Noel-Levitz. (2011a). 2011 national student satisfaction and priorities report. Coralville, IA: Author. Retrieved from: www.noellevitz.com.

Noel-Levitz. (2011b). *2011 student retention practices at four-year and two-year institutions*. Coralville, IA: Author. Retrieved from: www.noellevitz.com/BenchmarkReports.

Noel-Levitz. (2011c). *Student retention services from Noel-Levitz*. Coralville, IA: Author. Retrieved from: www.noellevitz.com.

Piaget, J. (1970). *Carmichael's manual of child psychology* (3rd ed., Vol. 1). New York: Wiley.

Petschauer, J. W., & Wallace, C. (2005). Engaging the first-year student. In R. S. Feldman (Ed.), *Improving the first year of college: Research and practice* (pp. pp. 177-194). Mahwah, NJ: Lawrence Erlbaum Associates.

Pierce, W. B. (2012). Academic Interest Questionnaire [Software]. Unpublished instrument. Retrieved from http://www.utc.edu/AdvisementAndStudentSuccess/AIQ2.php

Sanders, L., & Burton, J. D. (1996). From retention to satisfaction: New outcomes for assessing the freshman experience. *Research in higher education, 37*(5), 555-567.

Schlechty Center for Leadership in School Reform. (n.d.) Theory of engagement. Retrieved from http://s3.amazonaws.com/www.schlechtycenter.org/tools/prod/4046/original/SC_on_Engagement.pdf?1303397633

Shulman, L. S. (2002). Making differences: A table of learning. *Change, 34*(6), 36-45.

SPSS: Statistical Package for the Social Sciences (Version 20) [Computer software]. San Jose, CA: IBM.

Trustees of Indiana University. (2011). NSSE national results 2010. Retrieved from http://nsse.iub.edu/html/annual_results.cfm

University of Tennessee at Chattanooga. (2005). UTC working to enhance student engagement. Retrieved from http://www.utc.edu/news/qep.php

University of Tennessee at Chattanooga. (2011a). Overview. Retrieved from http://www.utc.edu/About/Overview.php

University of Tennessee at Chattanooga. (2011b). First-time freshmen by college of major: Fall 2001-Fall 2010. Retrieved from http://www.utc.edu/Administration/PlanningEvaluationAndInstitutionalResearch/documents/FreshmenbyCollege01-10.pdf

University of Tennessee at Chattanooga. (2011c). One-year retention rates: First-time freshmen. Retrieved from http://www.utc.edu/Administration/PlanningEvaluationAndInstitutionalResearch/documents/Retention-Freshmen01-10.pdf

U.S. Department of State. (n.d.) Search for colleges and universities. Retrieved from http://www.educationusa.info/search_for_colleges_and_universities.php

Vygotsky, L. S. (1962). *Thought and language*. Cambridge, Massachusetts: MIT Press.

Vygotsky, L. S. (1978). *Mind in society: The development of higher mental processes*. Cambridge, Massachusetts: Harvard University Press.

Zimmerman, B. J. (1989). Models of self-regulated learning and academic achievement. In B. J. Zimmerman & D. H. Schunk (Eds.) *Self-regulated learning and academic achievement: Theory, research, and practice* (pp. 1-25). New York: Springer-Verlag.

APPENDIX A

Figure 1. Sample Academic Interest Questionnaire (AIQ)

High School Coursework

Indicate which of the following Math courses you have completed or will complete in high school. (Check all that apply)

- ☐ Algebra I
- ☐ Geometry
- ☐ Algebra II
- ☐ Pre-Calculus
- ☐ Trigonometry
- ☐ Calculus
- ☐ Statistics
- ☐ Other:

Indicate which of the following Science courses you have completed or will complete in high school. (Check all that apply)

- ☐ Biology
- ☐ Chemistry
- ☐ Geology
- ☐ General Science
- ☐ Physical Science

* Required

Course Selection for General Education

Think about which subjects you would like to explore in your first semester to complete the remainder of your schedule. Choosing from at least two categories, select a minimum of five courses that appeal to you.

1. Natural Sciences

The purpose of studying the natural sciences is to participate in the systematic ways in which human beings analyze the physical universe, to appreciate the achievements of the human mind in comprehending the universe, and to understand the significant role of the natural sciences in human development. Courses in this category emphasize empirical studies of matter, energy, living systems, natural processes, and related phenomena, and examine science in the context of human culture.

Natural Science Lab Courses

To register for a lab course your first semester, you must have a Math ACT Subscore of at least 22.

- ☐ ASTR 1020: Introduction to Astronomy-Stars to Galaxies
- ☐ BIOL 1110: Principles of Biology I
- ☐ CHEM 1110: General Chemistry I
- ☐ ESC 1500: Environmental Science I
- ☐ GNSC 1110: The Physical Environment: Atoms to Galaxies
- ☐ GEOL 1110: Physical Geology

Natural Science Non-Lab Courses

- ☐ BIOL 1100: Conservation of Biodiversity

* Required

College-Level and Advanced Placement Courses

Have you taken any college-level courses while in high school for which you may receive credit? (Not including AP or IB courses) *

Dual Enrollment Courses Count Here

- ○ Yes
- ◉ No

If Yes, which college did you take Dual Enrollment through?

Example: Chattanooga State

Which courses did you take for Dual Enrollment?

Example: ENGL 1010, MATH 1130, HIST 2010

How many hours of Dual Enrollment will you be transferring to UTC?

Example: 24

APPENDIX B

Table 1. Descriptive Statistics

Baseline 2010 Group	Mean	Standard Deviation	N
Fall Semester GPA	2.7083	0.99634	1931
Fall Earned Hours	10.99	3.98	1931
Fall Academic Standing	1.21	0.407	1931
Spring Retention	1.08	0.279	1931
Comparison 2011 Group	Mean	Standard Deviation	N
Fall Semester GPA	2.7469	0.99055	2153
Fall Earned Hours	11.27	3.902	2153
Fall Academic Standing	1.19	0.389	2153
Spring Retention	1.08	0.27	2153

Table 2a. Baseline 2010 Cohort Group Correlations

Baseline 2010 Cohort Group		Fall Semester GPA	Fall Earned Hours	Fall Academic Standing	Spring Retention
Fall Semester GPA	Pearson Correlation	1	.741**	-.756**	-.302**
	Sig. (1-tailed)		0	0	0
	N	1931	1931	1931	1931
Fall Earned Hours	Pearson Correlation	.741**	1	-.663**	-.283**
	Sig. (1-tailed)	0		0	0
	N	1931	1931	1931	1931
Fall Academic Standing	Pearson Correlation	-.756**	-.663**	1	.213**
	Sig. (1-tailed)	0	0		0
	N	1931	1931	1931	1931
Spring Retention	Pearson Correlation	-.302**	-.283**	.213**	1
	Sig. (1-tailed)	0	0	0	
	N	1931	1931	1931	1931

**. Correlation is significant at the 0.01 level (1-tailed).

Table 2b. Comparison 2011 Cohort Group Correlations

Comparison 2011 Cohort Group		Fall Semester GPA	Fall Earned Hours	Fall Academic Standing	Spring Retention
Fall Semester GPA	Pearson Correlation	1	.723**	-.764**	-.341**
	Sig. (1-tailed)		0	0	0
	N	2153	2153	2153	2153
Fall Earned Hours	Pearson Correlation	.723**	1	-.640**	-.324**
	Sig. (1-tailed)	0		0	0
	N	2153	2153	2153	2153
Fall Academic Standing	Pearson Correlation	-.764**	-.640**	1	.245**
	Sig. (1-tailed)	0	0		0
	N	2153	2153	2153	2153
Spring Retention	Pearson Correlation	-.341**	-.324**	.245**	1
	Sig. (1-tailed)	0	0	0	
	N	2153	2153	2153	2153

**. Correlation is significant at the 0.01 level (1-tailed).