

REGISTRATION AND COURSE SELECTION PROCESSES OF ENTERING  
FRESHMEN AND THE EFFECTS ON ACADEMIC SUCCESS  
AND RETENTION AT A MIDSIZE PUBLIC UNIVERSITY

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A Dissertation Submitted to the Faculty of the University of  
Tennessee at Chattanooga in Partial  
Fulfillment of the Requirements of the Degree  
of Doctor of Philosophy

The University of Tennessee at Chattanooga  
Chattanooga, Tennessee

May 2019

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## ABSTRACT

This mixed-methods study concentrated on students who participated in a 2-day freshman orientation program and registered for courses at a midsize metropolitan 4-year public university located in the southeastern United States. This study examined three cohorts of entering freshmen as they progressed through the course-registration process of freshman orientation and then one full academic year. There was also consideration of the institutional departments involved in the process and their perceptions of the experience.

The quantitative portion of this mixed-methods study was based on Bean and Metzner's (1985) longitudinal tracking system for nontraditional student attrition. Two frameworks were used for the qualitative portion of the study. The first was constructivist grounded theory due to its research of a university process, and how this process may impact various independent departments in the institution. The second portion of the qualitative review was narrative inquiry; the lived experience of the researcher with respect to the preregistration process provided a program evaluation of the process itself.

The first research question addressed the combination of student characteristics that best predicted first-year student academic success. Across all academic success markers, female students were more likely to be successful than male students. The second research question asked what combination of the six academic outcome variables best predicted first-year student retention at the University of Tennessee at Chattanooga (UTC). The variables with the most significant impacts were UTC grade point average (GPA), semester earned credits, attempted

overall credits, and the completion of preregistration. The third research question considered if the method of first-time course registration was significant in student retention. It was determined that the preregistration process had a positive impact.

Finally, the fourth research question was a consideration of the perceived impact of the Academic Interest Questionnaire (AIQ) on administrative processes. Through narrative inquiry, the AIQ was found to have improved over time, and the majority of academic departments have become vested in the process. The narrative findings were supported by interview responses.

## ACKNOWLEDGEMENTS

This dissertation, and my entire doctoral journey, were the result of the incomparable support of my family, friends, and colleagues. I would like to first acknowledge my husband Michael, who never doubted my ability or diligence to complete this process while supporting our two (and later, three) children. Second, I would like to acknowledge my parents, Lew and Janice Hazlewood, for understanding and supporting my need for lifelong learning. A special thanks goes to Dr. Fran Bender, retired Assistant Provost at the University of Tennessee at Chattanooga, who planted the idea for this study and was instrumental in the implementation of the Academic Interest Questionnaire. Stacie Grisham, Elizabeth Johnson, and Kayla McAuliffe are supportive friend-colleagues who offered me unwavering feedback, guidance, and not-so-gentle nudges when I needed them most. To Dr. Jenny Holcombe, who was happy to help me at the most inopportune times when I struggled to work with statistical data. To my dissertation committee, I want to express my gratitude for their patience and academic leadership – especially Dr. Jim Tucker. Thank you for being my cheerleader and personally articulating my calling in life: to explore and improve the mechanics of the university.

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## LIST OF ABBREVIATIONS

UTC, University of Tennessee at Chattanooga

GPA, Grade Point Average

AIQ, Academic Interest Questionnaire

ACT, American College Testing

SAT, Scholastic Aptitude/Assessment Test

AP, Advanced Placement

FAFSA, Free Application for Federal Student Aid

FERPA, Family Educational Rights and Privacy Act

IRB, Institutional Review Board

SPSS, Statistical Package for Social Sciences

HHP, Health and Human Performance

SAP, Satisfactory Academic Progress

CASS, Center for Advisement and Student Success

ULL, University of Louisiana at Lafayette

## CHAPTER I

### INTRODUCTION

#### Introduction and Background

In higher education, 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). Seidman (2005) expands on this definition by placing the responsibility of retention on the institution, and its ability “to retain a student from admission through graduation” (p. 14). 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; Levitz, Noel, & Richter, 1999; Sanders & Burton, 1996). This is especially true as new federal and state funding formulas are being implemented to finance institutions based on outcomes rather than enrollment (Fain, 2013; Tennessee Higher Education Commission, 2010, 2011a, 2011b).

Orientation programs, specialized academic advisement, and student success initiatives are being developed and reconditioned across the country in all levels of higher education (Cueso, 2005; Mattern, Marini, & Shaw, 2015; Noel-Levitz, 2013b; Xu, 2016). Orientation programs assist individuals as they transition to the student environment, while student success initiatives promote a “desirable student outcome” (Cuseo, 2007, p. 2). These desirable outcomes may include student retention, educational attainment, academic achievement, student advancement, and holistic development. As these transition and support platforms advance, so

does the need to implement efficient modes of research, assessment, and application of retention practices. In particular, it is important to recognize that while retention's primary elements are academic, operational areas like course registration should be evaluated alongside the academic aspects when examining a student's lack of persistence (Dolence, 1991; Seidman, 2005).

This mixed-methods study concentrated on students who participated in a standard two-day freshman orientation program and registered for courses at a midsize metropolitan four-year public university located in the southeastern United States. The perceptions of the institutional departments involved in the process were also considered. Extensive comparative data was provided from multiple academic years.

#### Statement of the Problem

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 and not drop out (Dolence, 1991; Hossler, 1991). Research supports the need to integrate these programs into a campus' strategic planning process, as a lack of this type of coordination is considered a primary reason for an institution's operational failures (Dolence, 1991; Hossler, 1991). Persistence of a student or group of students 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, the rate of student retention is a primary gauge for assessing an institution. A student who is not satisfied with their experience and, as a result, transfers or withdraws from the college is likely to share that experience with others, potentially tarnishing the reputation of the institution (Levitz et al., 1999).

## Purpose of the Study

The purpose of this research was to investigate the relationships between designated student characteristics and course registration methods during the freshman orientation process. The results found within this research were analyzed to determine if certain combinations of these characteristics and/or registration methods ultimately led to positive academic outcomes and increased student retention rates. An additional qualitative examination considered the operational elements of the preregistration process and their perceived impact.

This study examined three cohorts of entering freshmen as they progressed through the initial course-registration process as part of freshman orientation and then proceeded through one full academic year. Each of the cohorts was registered in courses in a different manner. Members of the first cohort (Baseline 2010 Comparison Group) self-selected and registered for courses that were available at the time of their orientation session. Members of the second and third cohorts (2011 and 2012 Comparison Groups) were assigned a course schedule based on their successful completion of an Academic Interest Questionnaire (AIQ) prior to orientation. The AIQ is an online survey that was completed by the student prior to their designated freshman orientation session. This survey was specifically designed to provide course selections appropriate to the major program requirements for each student. Additionally, many course sections were purposely reserved for entering freshmen.

The 2011 Comparison Group was the first cohort to complete the preregistration process. The preregistration process was slightly different for the 2012 Comparison Group: the staff involved in the process had prior-year experience, additional restricted course sections were provided, course registration for the general student population was closed, and freshman



students included in the preregistration process were limited in their abilities to alter their course schedule following their orientation session.

## Research Questions

Listed below are the research questions that guided this study:

1. What combination of student characteristics best predicts first-year student success at UTC as measured by six academic outcome variables (see Appendix A, Variables Analysis)?
  - The student characteristics include the following:
    - a. The style of first-time course registration (independent self-selected registration versus personalized preregistration)
    - b. The comparison grouping (as determined by the course registration style and amount of course schedule changes)
    - c. Permanent residency (county)
    - d. Gender
    - e. Academic college
    - f. Academic program
    - g. ACT or SAT composite score and Math and English ACT sub-scores
    - h. Dual enrollment and Advanced Placement (AP) credits earned
    - i. Pell Grant eligibility
    - j. Financial Aid Satisfactory Academic Progress status
  - The academic outcome variables include the following:
    - a. Semester GPA

- b. Semester attempted credit hours
  - c. Semester earned credit hours
  - d. Overall GPA
  - e. Overall attempted credit hours
  - f. Overall earned credit hours
2. Of the six academic outcome variables, what combination best predicts first-year student retention at UTC (with retention measured as Retained – yes or no)?
  3. Does the initial course registration method (independent self-selected registration versus personalized preregistration) used have a relationship with first-year student retention at UTC (with retention measured as Retained – yes or no)?
  4. Is there a perceived impact of the preregistration process on administrative policy and procedure?

## Research Hypotheses

Listed below are the research hypotheses for this study.

1. A combination of student characteristics will best predict first-year student success at UTC as measured by six academic outcome variables (see Appendix A, Variables Analysis).
2. Of the six academic outcome variables, one of the combinations will best predict first-year student retention at UTC (with retention measured as Retained – yes or no).
3. The initial course registration method (independent self-selected registration versus personalized preregistration) used will have a relationship with first-year student retention at UTC (with retention measured as Retained – yes or no).

4. There will be a perceived impact of the preregistration process on administrative policy and procedure.

### Rationale for the Study

While much research (Prevatt et al., 2011; Rothstein, 2004; Zwick & Sklar, 2005) has concentrated on the effects of high school GPA and standardized test scores in relation to student retention, minimal research has been completed to investigate and analyze registration behavior of students. Of this limited research, all of the evaluations have been confined to the enrollment and registration habits of late registrants and their correlation to regular registrants (Angelo, 1990; Diekhoff, 1992; Mannan & Preusz, 1976; Peterson, 1986). For example, attrition rates of college students could be the effect of administrative variables, not just academics (Dolence, 1991; Levitz & Hovland, 1998). In fact, in a Noel-Levitz (2013a) student satisfaction survey, the need to register for necessary classes ranked third in a list of 73 items, and the preregistration method utilizing the AIQ aims to satisfy this need. Therefore, it is important to identify the degree to which the processes involved in course registration have a direct impact on student retention, as Levitz and Hovland (1998) have implied.

In addition to the procedural facets of the study, such as the AIQ and preregistration processes, institutions must consider the financial benefit that could be gained from increased student retention. In 2010, the State of Tennessee joined 21 other states in the pursuit of Complete College America, an outcomes- and performance-based funding formula concept (Fain, 2013; Tennessee Higher Education Commission, 2010, 2011b). Under the Complete College Tennessee Act (Tennessee Higher Education Commission, 2010), all institutions of higher education compete for state funding related to their success in retaining and graduating

students, rather than general admission and enrollment numbers. For the purposes of the current study, identifying additional methods of retaining students could directly relate to the institution's success within the new legislation (Fain, 2013; Tennessee Higher Education Commission, 2010, 2011a, 2011b).

### Theoretical/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. Bean and Metzner (1985) have developed one such tracking system for nontraditional student attrition (see Figure 1), from which the conceptual framework for this study was derived (see Figure 2). While Bean and Metzner evaluated six background and defining variables, four environmental variables, three social integration variables, and six academic variables, the present study evaluated five background variables, one environmental variable, four academic variables, and two registration variables. The background variables were, the student's permanent residency (county), gender, ACT composite score (or SAT, if applicable), math and English ACT sub-scores, and any dual enrollment and Advanced Placement (AP) credits earned. The environmental variable was the student's Pell Grant eligibility, and the academic variables included the student's academic college, current major, former major (if applicable), and Financial Aid Satisfactory Academic Progress status. The registration variables were the style of first-time course registration and the assigned comparison grouping.

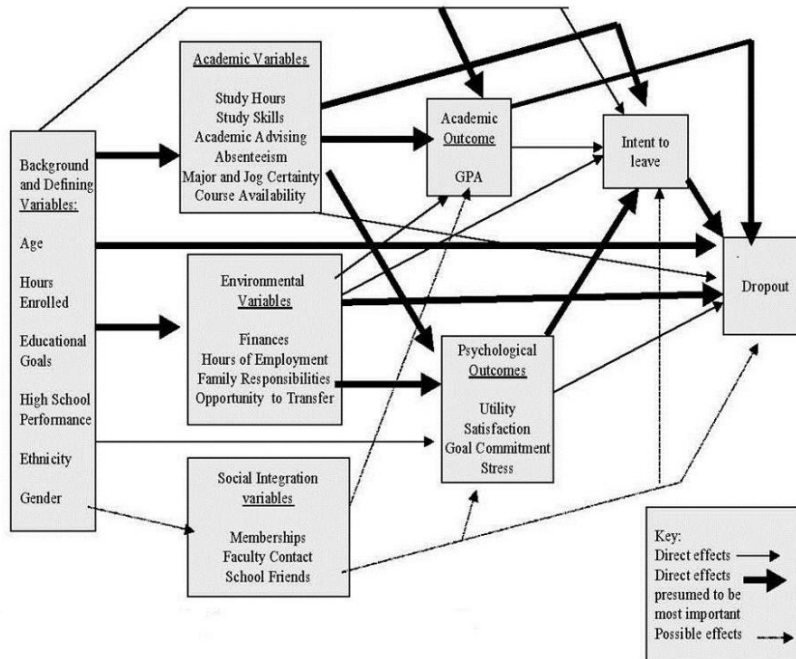


Figure 1 Bean and Metzner's (1985) model of nontraditional student attrition

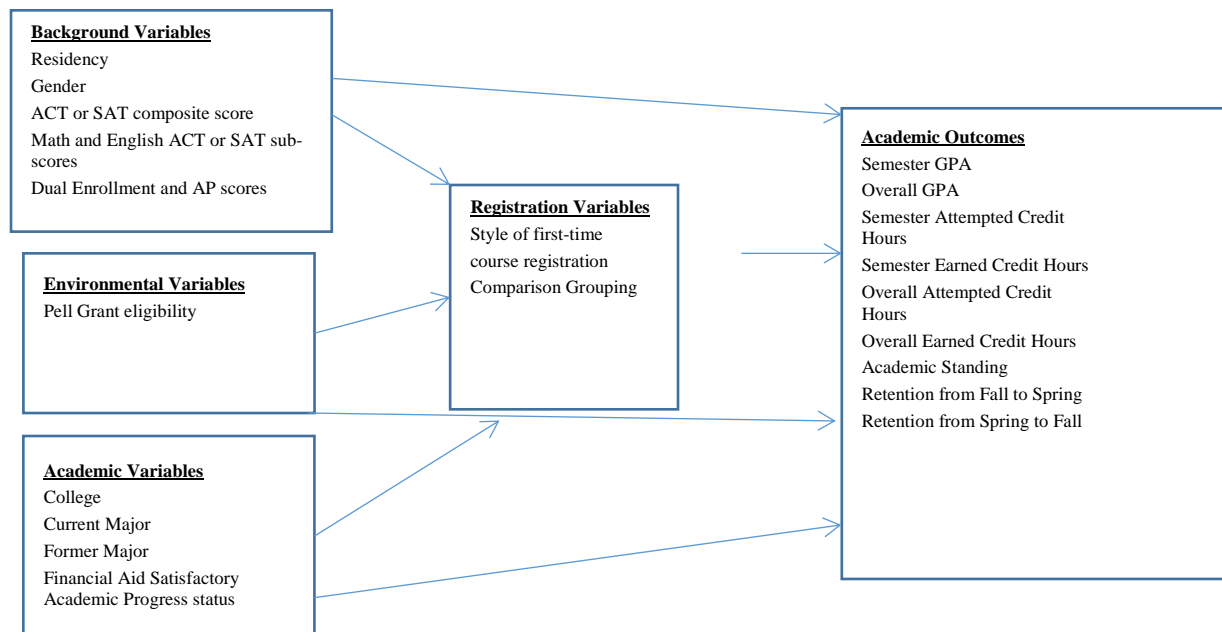


Figure 2 Bass' academic outcomes per registration method

In terms of outcomes, Bean and Metzner (1985) identified one academic outcome and four psychological outcomes, while this study identified six academic outcomes for each of the three distinct semesters (fall, spring, and the subsequent fall). These academic outcomes included semester and overall GPA; semester and overall attempted credit hours; and semester and overall earned credit hours. Each of these academic outcomes was considered viable, based on their common usage in institutional research and simplicity in communicating to the general public. Bean and Metzner's (1985) "intent to leave" (p. 495) aspect was not evaluated, but the "dropout" (p. 495) factor was blended into the existing academic outcomes.

Two frameworks were used for the qualitative portion of the study. The first was constructivist grounded theory in nature, due to its research of a process within a university, and how this process may impact various independent departments in the institution (Charmaz, 2006; Creswell, 2013). The five participants in the qualitative aspect of this study had all experienced the process of course registration for first-year students, although indirectly as departmental administrators. All participants were selected by theoretical sampling, based on their perspective as administrators within their academic and student service departments, and were interviewed by an associate of the researcher that is familiar with the course registration process. During this interview, participants were asked the following questions:

1. What is your understanding of the Academic Interest Questionnaire process?
2. How have you seen the program evolve and/or impact the organizational structure?
3. What benefits have you experienced in your department/college since the program has been in place (2011)? Examples: Advisement, Communication between departments, retention, student preparedness.

4. What challenges have you experienced in your department/college since the program has been in place (2011)? Examples: Advisement, Communication between departments, retention, student preparedness.

The second portion of the qualitative framework was narrative inquiry. As suggested by Clandinin (2013), narrative inquiry considers lived experience as a source of valuable knowledge and understanding (Creswell, 2013). In this case, the lived experience of the researcher before, during, and after the implementation of the preregistration process provided a program evaluation of the process itself, the communication procedures within the institution, and other administrative changes that may have contributed to student academic success and retention.

#### Significance/Importance of the Study

If it were determined that registration behavior of entering freshmen had a relationship with student retention when analyzed alongside assorted student characteristics, the personalized preregistration program could be enhanced further to increase student engagement and progressive academic success. Furthermore, as Dolence (1991) 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 likely to recognize the retention connection between academics and administrative practices and adopt a program that successfully integrates these areas (Dolence, 1991). Additionally, with improved student retention, institutions could expand implemented practices to other classifications beyond the freshman level, thus implementing possible opportunities to decrease outgoing transfer students and increase overall undergraduate degree completion rates.

## Definition of Terms

- **Academic Interest Questionnaire (AIQ):** An online survey completed by the student prior to their designated freshman orientation session. This survey was specifically designed to provide course selections appropriate to the major program requirements for each student.
- **Academic Outcomes:** Six aspects were identified for each student. These included semester GPA, overall GPA, semester attempted credit hours, overall attempted credit hours, semester earned credit hours, and overall earned credit hours.
- **Academic Standing:** The end of semester designation indicating whether a student was in Good Standing, or on Academic Probation, Academic Suspension, or Academic Dismissal.
- **Attempted Credit Hours:** The number of credit hours in which a student was enrolled as of the first day of the third week of the semester.
- **Attrition:** The situation that resulted when a currently-enrolled student did not re-enroll for the subsequent term.
- **Course Waitlisting:** The practice of students to be added to a virtual list in the event new space became available in a course that was previously filled.
- **Earned Credit Hours:** The number of credit hours that a student successfully completed with a grade of A, B, C, D, or S.
- **Freshman Student:** For the purpose of this study, this was a student that had not previously been enrolled in higher education. Students that had been dually-enrolled in high school and higher education were considered freshmen for this study.
- **Grade Point Average (GPA):** The calculation of the number of grade points a student earned in a given period of time divided by the total number of credit hours given.



- **Independent Self-selected Registration:** A process that would occur when a student obtained their advisement code, generally through academic advising, and selected and registered for courses from the online schedule of classes. While an existing or continuing student may have had several days or weeks to complete this process, the entering freshman attending an orientation session may have had two hours or less to be academically advised and to register for classes. Under this process, students were at liberty to manipulate their course schedules (drop or add classes) for up to three months prior to the start of the semester.
- **Overall Attempted Credit Hours:** The number of credit hours that a student had attempted over the course of their college career (i.e., more than one semester).
- **Overall Earned Credit Hours:** The number of credit hours that a student had earned over the course of their college career (i.e., more than one semester).
- **Overall GPA:** A student's GPA including all coursework attempted (i.e., more than one semester).
- **Persistence:** The action of a student remaining at a higher education institution from one semester to the next, potentially through graduation.
- **Personalized Preregistration:** The student's academic advisor developed a personalized schedule for the student, based on their responses on the AIQ. Appropriate courses were then registered for the student prior to their freshman orientation session. Under this process, students were prevented from manipulating their course schedules (drop or add classes) until approximately ten days before the start of the semester.
- **Pre-major:** A major designation for students that have not yet been admitted to their major of choice, or who may be undecided in their major.

- Readiness: An appropriate score on the ACT or SAT (composite or sub-score), indicating the student was prepared for college-level coursework.
- Registration Period: The period that a student was eligible to drop and add courses, through the second week of classes each semester.
- Residency: The region of the student's permanent residence. Examples included east Tennessee (TN), west Tennessee, middle Tennessee, and out of state.
- Retention: The process of an institution to keep a student or group of students enrolled from one semester to the subsequent semester, potentially through graduation.
- Semester: A term within the academic year: Fall (August-December); Spring (January-April/May); Summer (May-August).
- Semester Attempted Credit Hours: The number of credit hours that a student had attempted during a single semester.
- Semester Earned Hours: The number of credit hours that a student had earned during a single semester.
- Semester GPA: A student's GPA following a single semester.
- Waitlisting: The process of adding a student to a digital waitlist for a course through the course registration system.
- Withdrawal Period: The period during which a student could drop a course and be assigned a withdrawal grade (W). This grade (W) was applied to the transcript at the end of term. This period ran from the first day of the third week of classes through the midpoint of the semester.

## Delimitations of the Study

This study investigated a representative sample of incoming freshman students, who registered at a midsize public university through the freshman orientation process for Fall 2010, Fall 2011, and Fall 2012. Any freshman student who did not participate in an orientation session, including those admitted to the institution late, or by exception, was excluded from this study. These excluded students, by not participating in an orientation session, were assumed to have also bypassed the AIQ process and would not have received the same personalized treatment as the remaining population. This subpopulation of excluded students was comprised of approximately one percent or less of the entering freshman population. Additionally, any students designated as athletes or certain scholarship program participants were not included in the study, as their registration processes have been personalized by design for several years, including the timeframe being evaluated.

## Limitations of the Study

The student information system output was limited to the specific data elements that were identified and sorted by the technical staff. Some data were generalized for review purposes. For example, rather than listing all courses that a student registered for or dropped during the registration period, measures were developed to identify:

- the original total number of credit hours registered,
- the number of changes (i.e., drops and adds) that the student made to their registration, and
- the number of credit hours attempted and earned at the end of the semester.

Additionally, the size and type of the institution being investigated prevented these results from being universally applied to other dissimilar institutions. Other limitations included the changing conditions since the generated study data were collected, including:

- the general passage of time from the beginning and end of the study (four years; 2010-2013),
- the tightening of entering freshman admissions standards (ACT and GPA), and
- the gradual introduction and implementation of an advanced freshman academic advising model.

Personal author bias was minimized from the quantitative perspective by utilizing strictly quantitative data and analyzing it, based on existing policies and procedures. Otherwise, the author has been immersed in the course-registration process and its development for over nine years as a former Assistant Registrar and current academic advisor. It was this perspective that was examined for the narrative inquiry portion of the paper. Widely-cited, peer-reviewed literature was examined and shared to support the variables assessed within the data and their tendency to be significant in student academic success.

For the constructivist grounded theory perspective, there were unique limitations. The selection of the participants for this study was largely determined by their length of service or administrative duties in their current or previous position at the university. Other participants could provide a more detailed perspective on the process being discussed in the interview, but the intent is to consider the higher-level perspective rather than someone that has directly experienced or been immersed in the process. Personal researcher bias was minimized by having a proxy conduct the interviews; in particular, an individual that is familiar with the current process, but was not active in the early stages of the process development and implementation.

## CHAPTER II

### LITERATURE REVIEW

Since the 1970s, student attrition and retention have been dominant concerns for colleges and universities. Leading theorists on these topics have included Astin (1984, 1993, 2006); Bean (1980, 1983); Bean and Metzner (1985); Bean and Vesper (1990); Cabrera, Nora, and Castaneda (1993); Pascarella and Terenzini (1980, 2005); Rendon (1994, 2002); Spady (1970, 1971); and Tinto (1975, 1982, 1985, 1987, 2012). Beyond general theory, substantial research has been conducted on practices to actively increase retention, particularly with regard to first-year college freshmen (Cueso, 2005; Dolence, 1991; Hossler, 1991; J. Kim, 2015; Levitz & Hovland, 1998; Sanders & Burton, 1996). One recent study, in particular, noted that about one-third of full-time, first-time college entrants failed to persist to the subsequent academic year (National Center for Education Statistics, 2014). The following literature review will discuss the various competing and blended theories that have been developed and tested with regard to the extensive body of knowledge on student retention and persistence. The author will also highlight significant factors that impact student attrition and practical applications aimed to counteract it.

#### Attrition and Retention Theory

Spady (1970, 1971) was an early proponent for the evaluation and assessment of student attrition from multiple interdisciplinary angles. His empirical analysis stemmed from a model based on Durkheim's (1951) theory of suicidal behavior and the individual's inability to

integrate into society on a social and intellectual level, which Durkheim (1951) then applied to the university environment. The combination of these two concepts encouraged and paved the way for Tinto (1975, 1982, 1985, 1987, 1993, 2012), the most prominent of modern retention and persistence researchers.

Tinto (1975, 1982) believed that most students choose to withdraw from college voluntarily, rather than due to insufficient academic performance. Per Durkheim's (1951) suicide theory and the interdisciplinary analysis of Spady (1970, 1971), Tinto (1975, 1982) concluded that students may suffer from the same inadequate integration on a university campus and therefore opt to abandon higher education as a result (Caison, 2007). The student integration model proposed by Tinto (1987, 1993) stresses the significance of a student's commitment to their academics and university, especially how the student is able to integrate or fit into the existing academic and social characteristics of an institution (Cabrera et al., 1993; DesJardins, Ahlburg, & McCall, 2002; D. R. Johnson et al., 2007). Specifically, Tinto's (1987, 1993) model places the responsibility of persistence and adaptation on the student, in terms of the academic and social interactions on a university campus, the commitment to an educational goal, or the decision to remain enrolled at a particular institution (Cabrera et al., 1993; Fischer, 2007; D. R. Johnson et al., 2007; Stratton, O'Toole, & Wetzel, 2007).

Bean (1980) developed an alternate model explaining students' persistence in college, which alludes to the process of turnover in work organizations and models of attitude-behavior interactions (Cabrera et al., 1993; March & Simon, 1958; Price, 1972). Bean and his colleagues (1980; Bean & Metzner, 1985; Bean & Vesper, 1990) have posited that professional turnover is a parallel process to student attrition, and the behavioral intentions of persisting or leaving college are important predictors in retention studies (Cabrera et al., 1993; Stratton et al., 2007).

Essentially, Bean's (1980) student attrition model clarified the individual student's personal intention to either remain enrolled in or depart from the institution and the sequence of events that lead to this decision. These events stem from an individual's initial beliefs, attitudes, and expectations upon entering the institution, which are, in turn, either confirmed or contradicted during their college experience (Bean, 1980, 1983; Cabrera et al., 1993; DesJardins et al., 2002; Fischer, 2007). With influence from Tinto (1975), Bean and Metzner (1985) later expanded the student attrition model to directly relate to the different experiences and background variables impacting nontraditional students' intent to leave higher education (Johnston, 2006; Summers, 2000).

Both Tinto (1987) and Bean (1983) discussed academic integration, although from different perspectives (Fischer, 2007). Specifically, the former considers that academic performance motivates corresponding integration, while the latter considers better grades a direct result of academic integration (Bean, 1983; Fischer, 2007; Tinto, 1987). Astin (1984) expanded on these integration theories and determined that students who become actively involved in college experiences have better academic and persistence outcomes (Fischer, 2007). Astin (1984) referred to this notion as the input-process-output (I-P-O) model, through which the quality and level of involvement in a student's college environment is directly related to their learning and progress (Fischer, 2007). Astin's (1984) comprehensive Theory of Student Involvement ultimately defines involvement as the way students behave, not just their thoughts, feelings, or meanings gleaned from experience (Harper & Quaye, 2009). Pascarella and Terenzini (2005) also recognized these factors in students' persistence decisions, supporting Astin's (1984) I-P-O model (Fischer, 2007; D. R. Johnson et al., 2007).

Cabrera, Castaneda, Nora, and Hengstler (1992) identified distinct overlap between Tinto's (1987) student integration model and Bean's (1980) student attrition model, namely in terms of organizational elements (courses and academic integration, for example) and commitments to the institution (Cabrera et al., 1993; DesJardins et al., 2002; Hossler, 1984). The common points between the models include: the theme of persistence as a result of longitudinal complex interactions, the notion that precollege characteristics impact students' adjustment to the institution, and persistence is directly related to an effective student-institution match (Cabrera et al., 1993; Hossler, 1984). Cabrera et al. (1992; 1993) also noted that any non-overlapping concepts may be simultaneously tested and ultimately merged between the competing frameworks. Cabrera et al. (1993) ultimately provided an altogether different blended persistence model which stressed the operational design of the psychological and sociological practices underlying persistence behavior (DesJardins et al., 2002).

Rendon's (1994, 2002) strongest contribution to the body of research on retention was the challenge she enacted to Tinto's longitudinal model of institutional departure (as cited in Barnett, 2011). Rendon (1994, 2002) contended that, for certain nontraditional and underserved student populations, validation of student needs by campus administrators and faculty would be more conducive to student persistence than simply integration into the community (as cited in Barnett, 2011). Rendon, Jalomo, and Nora (2000) expanded this argument, indicating that Tinto's (1993) logic inappropriately placed all responsibility for integration on the student rather than recognizing institutional shortcomings (D. R. Johnson et al., 2007). Rendon et al. (2000) and D. R. Johnson et al. (2007) further emphasized that the fostering of college success should not be considered universal to students of varying backgrounds.



A lesser-studied concept with relation to retention has been “sense of belonging” (D. R. Johnson et al., 2007, p. 525) or “fitting in” (Nora, 2004, p. 180) (Berger, 1997; Hausmann, Ye, Schofield, & Woods, 2009; Schlossberg, 1989). While Hausmann et al. (2009) stressed the need for institutions to encourage students as valuable members of the university community, Schlossberg (1989) believed that students needed to experience “mattering” (p. 6), or the perception that their presence on campus was noticed and important to others (D. R. Johnson et al., 2007). Berger’s (1997) “sense of community” (p. 441) within residence halls was thought to assist students’ emotional connections and membership into the institution, and Nora (2004) presented “fitting in” (p. 191) as the extent to which a student sensed that they fit into the institution socially and personally. D. R. Johnson et al. (2007) combined these notions into a single philosophy: “students have a fundamental need to feel that they are an important part of a larger community that is valuable, supportive, and affirming” (p. 527).

### Sources of Attrition

In the mid-1980s, 40% of college entrants failed to complete a bachelor’s degree (Anderson, 1985). The following decade, the retention challenge continued with attrition rates across the United States varying up to 50%, with an estimated 20-30% abandoning higher education during their freshman year (Nicpon et al., 2006; Tinto, 1993). Tinto (2012) concluded that even though access to higher education doubled between 1980 and 2011, overall college completion rates still hovered around 63% at four-year institutions. Most concerning from this particular study, however, is the finding that most of the students that opt to leave higher education do so before the start of their second year (Nicpon et al., 2006; Tinto, 1987, 2012). Furthermore, these dropout students tend to voluntarily leave their respective institutions for

various reasons other than academic failure (Lenning, 1982; Tinto, 1982). Many theorists point to lack of student integration or university connection for student departure (Astin, 1984, 1993; Bean, 1980, 1983; Cabrera et al., 1992; Cabrera et al., 1993; Rendon, 1994, 2002; Rendon et al., 2000; Spady, 1970; Tinto, 1975, 1982, 1985, 1987, 1993, 2012). Alternately, others attribute the attrition causes to personal, financial, or environmental issues, lack of appropriate college preparation, or procedural complications within or outside of the institution (Anderson, 1985; Bean, 2005; Bean & Vesper, 1990; Fischer, 2007; Hossler, Ziskin, Gross, Kim, & Cekic, 2009; Lotkowski, Robbins, & Noeth, 2004; Mattern et al., 2015; Oseguera & Rhee, 2009; Westrick, Radunzel, Le, Robbins, & Schmidt, 2015). The most important concept identified in the literature is simply that the causes underlying an individual student's decision to leave college are unique, therefore it is necessary to identify and apply retention practices to the different potential scenarios (Braxton, Hirschy, & McClendon, 2004; Cabrera et al., 1993; Cruce, Wolniak, Seifert, & Pascarella, 2006; Forsman, van den Bogaard, Linder, & Fraser, 2015; Hossler, Ziskin, & Gross, 2009; Lotkowski et al., 2004; Pascarella & Terenzini, 2005; Pike & Kuh, 2005; Tinto, 1993; Wilcox, Winn, & Fyvie-Gauld, 2006).

### Entering Characteristics and College Preparedness

Entering student characteristics such as demographics, entrance exam scores, and especially secondary school academic preparation have been labeled as confident indicators of students' commitment level, retention, and degree completion (Astin, 2006; Benford & Gess-Newsome, 2006; Braxton, Jones, Hirschy, & Hartley III, 2008; Cruce et al., 2006; National Center for Education Statistics, 2014; Prevatt et al., 2011; Sackett, Kuncel, Ameson, Cooper, & Waters, 2009; Stratton et al., 2007; Tinto, 1975, 1993; Westrick et al., 2015; Zwick & Sklar,

2005). It has been argued that high school grading standards could vary across schools throughout the country, undermining the impact of the high school GPA as an academic success marker (Westrick et al., 2015; Woodruff & Ziomek, 2004a, 2004b). However, Bowen, Chingos, and McPherson (2009) report that high school GPA, regardless of the rigor of high school attended, is positively and consistently associated with graduation rates.

Expanding on the concept of lacking college preparation, first-generation students and those from lower socioeconomic statuses are often less-informed about college choices (Baum, Ma, & Payea, 2010; McKinney & Novak, 2013; Pike & Kuh, 2005). These disadvantaged students are less likely to complete a degree in general, and those that ultimately do graduate take longer than the standard four years (Bowen et al., 2009; Engstrom & Tinto, 2008; Lenning, 1982; Stratton et al., 2007). Compared to 83% of highest-income students that graduate within six years, only 70% of the lowest-income bracket complete college in the same timeframe (Baum et al., 2010).

### Financial Aid

Completion of the Free Application for Federal Student Aid (FAFSA) is a critical step for students to take advantage of possible financial assistance for college (Davidson, 2013; J. E. King, 2006; McKinney et al., 2013; Novak & McKinney, 2011). Many students, however, choose to not apply, based on their assumption that the process is too complex, that they are not eligible, or that they do not need aid. In rare cases, financial aid has been shown to negatively impact persistence, based on the insufficient amounts offered (Pascarella & Terenzini, 2005; St. John, Andrieu, Oescher, & Starkey, 1994). However, in most cases, financial aid has been indicated to promote access and persistence (Berger & Braxton, 1998; Cabrera et al., 1993;

DesJardins, Ahlburg, & McCall, 1999; DesJardins et al., 2002; Douglass & Thomson, 2012; Gross, Hossler, & Ziskin, 2007; Hossler, Ziskin, Gross, et al., 2009; Lotkowski et al., 2004; McKinney & Novak, 2013; Museus, 2009; Novak & McKinney, 2011; St. John et al., 1994; Stratton et al., 2007; Westrick et al., 2015), and Davidson (2013) has gone so far as to urge institutions to require all students complete the FAFSA.

In 2010, the Advisory Committee on Student Financial Assistance reported to Congress and the U.S. Secretary of Education that the initial enrollment rates of low-income and moderate-income high school graduates in four-year institutions were declining significantly across the board (Advisory Committee on Student Financial Assistance, 2010). This report further emphasized the importance of transforming federal policy to effectively address income-related disparities in academic preparation, access, and persistence simultaneously. Based on data from the same period, the American Council on Education Center for Policy Analysis (2006) noted that the number of low- and moderate-income college students likely eligible for financial aid but choosing to *not* apply was increasing. The first concern, then, is to determine why enrollment rates for these populations are waning and second, to identify the reasons why the students do not take advantage of available financial assistance. Finally, for those students who do enroll and take advantage of the financial aid provided for them, it is necessary to pinpoint whether or not finances play a role in their persistence.

Bettinger (2004) reported strong indicators that eligibility and payment of Pell Grants reduces attrition, supporting a previous claim that the first years of college could be modestly related to frontloaded aid programs (DesJardins et al., 2002). Specifically, Novak and McKinney (2011) found that among Pell-eligible students, FAFSA-filers had 122% greater expectancy of persisting from the fall to spring terms than eligible non-filers (McKinney & Novak, 2013).

Conversely, students may consider a reduced financial investment in their studies if significant levels of aid are provided, and they may be less motivated and perform even worse academically (Bettinger, 2004). This “sunk cost of fallacy” (Bettinger, 2004, p. 10) concept could directly contribute to dropout if the student fails to reapply for aid for future terms or otherwise loses eligibility. As an effort to apply student responsibility to financial aid, recommendations abound for support of on-campus work-study programs (Gansemer-Topf & Schuh, 2005; Kuh, Kinzie, Schuh, White, & Associates, 2005; Stratton et al., 2007). These programs may provide income, immerse and engage the student in the institutional culture, and reduce the need for off-campus work. Furthermore, Lohfink and Paulsen (2005) found that while each \$1,000 increase in grant aid resulted in a 2.7% increase in persistence probability, the same amount of increase in work-study aid generated a 6.4% increase in likelihood of persistence.

Heller (2005) found that while federally-funded Pell grants covered about 72% of fees in 1976, the maximum support had dropped to only 38% coverage by 2003 due to the rising costs of attendance at the typical four-year public institution (Attewell & Lavin, 2007a, 2007b). As a result, many of the poorest students have the largest gap in financial need and assistance (Mortenson, 2005). Instead, much of the gap in financial assistance is being offered as merit aid. With an association between academic grades and family income, this philosophy disproportionately allocates more aid to middle- and upper-income applicants (Attewell & Lavin, 2007b; Heller, 2005). Specifically, Lynch, Engle, and Cruz (2011) reported that students at the lowest income levels may contribute 70% of their income to attend a four-year institution even with grant aid, while high-income families may only contribute about 10% of their income (Novak & McKinney, 2011). This issue can be exacerbated when a poorer student opts to attend a university with little to no institutional grant aid available (Heller & Callender, 2013). Overall,

when comparing Pell-eligible students to the remaining student population, it was found that the predicted GPA and first-year retention of the needier students was slightly lower over a 10-year period (University of Colorado Boulder, 2011).

Merit aid is often awarded with “strings attached” like full-time enrollment and minimum GPA requirements, which could lead to increases in persistence and timely degree completion (Bound, Lovenheim, & Turner, 2012; DesJardins et al., 1999, 2002; Scott-Clayton, 2011). In fact, DesJardins et al. (2002) have reported that replacing student loans with scholarships of the same amount has a moderate positive effect on continuation (Hossler, Ziskin, Gross, et al., 2009). State lottery-funded scholarships have become prevalent, particularly in Louisiana (Louisiana Office of Student Financial Assistance, 2014), Georgia (Condon, Prince, & Stuckart, 2011), and Tennessee (Ness & Noland, 2007; Tennessee Student Assistance Corporation, 2014). In the Georgia study, lottery scholarship recipients were reported to have earned more credit hours, had slightly higher GPAs, and graduated quicker than non-recipients (Condon et al., 2011; Henry, Rubenstein, & Bugler, 2004). In fact, a study of institutional scholarships found that students eligible to receive additional funding, provided they met necessary academic outcomes and participated in extensive academic support programs, outperformed students that only received the academic support, which could illustrate the motivation factor underlying merit aid (Glenn, 2007). It is rather important to note, though, that a more recent study of merit-based student aid programs found no empirical evidence that this type of funding increases higher education outcomes (Sjoquist & Winters, 2015). In particular, Sjoquist and Winters (2015) recognized that the students targeted with merit aid are already academically stronger students, and therefore are more likely to persist and graduate anyway: “Conceptually, merit aid programs

may have minimal effects on college degree completion because they are not targeted to students at the margin of graduating or not” (p. 386).

In 2008, federal loan volume had reportedly increased by 107% over the past decade (Heller, 2008). Even more concerning was the fact that private loans increased 894% during the same time span (Heller, 2008). Dowd and Coury (2006) found that while loans were negatively related to persistence from the freshman to sophomore years, there appeared to be no impact in future years (Heller, 2008). DesJardins et al. (2002) supported this finding that loans, as well as grants, are time-sensitive in their impact on student departure (Museus, 2009). In general, Heller (2008) reported that loans have minimal impact on student persistence, although many borrowers are void of grant aid eligibility. Therefore, if grant aid were proportionally higher, then loans may provide a positive impact. Additionally, in terms of dropping out, many students do not recognize that they must repay loans very soon after leaving the institution, and nearly 25% of these students default at least once on their loan repayment (Heller, 2008).

### Enrollment and Registration

The literature on course registration behaviors is extremely limited, and most sources only discuss course dropping or late registrations with regard to two-year institutions (Angelo, 1990; Bean & Metzner, 1985; Bryant, Danley, Fleming, & Somers, 1996; Diekhoff, 1992; Fleming, Hill, & Merlin, 1985; Hagedorn, Maxwell, Cypers, Moon, & Lester, 2007; Johnston, 2006; Mangold, Bean, Adams, Scwab, & Lynch, 2003; Moran, Bausili, & Kramer, 1995; Morris, 1986; Street, Smith, & Olivarez, 2001; Summers, 2000). Summers (2000) conducted a study at a rural community college to examine student enrollment behaviors and assorted outcomes, and found that students who remained enrolled, registered earlier than those who subsequently

dropped out (Johnston, 2006; Summers, 2000). Summers' analysis, based on Bean and Metzner's (1985) model of nontraditional undergraduate student attrition, forms the origin for the current study. Summers (2000) concluded that students who persisted in college, registered for classes approximately twenty-nine days earlier than their drop-out counterparts. Most importantly, this report found that for each additional course dropped, the expectancy that a student would re-enroll the following term lessened by more than 50% (Johnston, 2006; Summers, 2000). Conversely, the earlier a student registered, the odds of enrolling in the subsequent term increased by nearly 1.3% per day.

Johnston (2006) attempted to replicate Summers' (2000) research at a different community college with similar cohort characteristics, and found that even with a ten-year difference between sampled groups, most analyses returned comparable findings. Specifically, both researchers found a negative effect from enrolling in classes late, an issue compounded by the fact that the students who registered late were ultimately also more likely to withdraw from most or all of their respective courses (Johnston, 2006; Summers, 2000). Johnston (2006) elaborated on his findings by stating that enrollment patterns are essentially behavior patterns that can be modified, especially if they are classified as motivation factors (or lack thereof, in these cases).

Mannan and Preusz (1976) conducted a study at a four-year institution and found that late registrants had lower academic performance than timely registrants (i.e., during the regular registration period). Another study stated that while grades were not necessarily related to timely registration, late registrants were more than twice as likely to drop or be dropped in programs with restrictive attendance policies (Diekhoff, 1992; Johnston, 2006; Summers, 2000). Bryant et al. (1996) conducted a similar study and found that in terms of students who registered late,



nearly 25% of them had withdrawn by the semester drop deadline. Similarly, Street et al. (2001) reported that 80% of timely registrants persisted to the next term as opposed to only 35% of those who registered for courses late. Angelo (1990), on the other hand, completed a similar study but found no linkage between academic performance and registration timeliness. Angelo (1990) did, however, note that the diverse student body found within community colleges could skew the data. For example, many of the early registrants may have been “academic window shopping” (i.e., registering for more credit hours than they intended to finish while they sampled various courses) and reduced their corresponding completion rates (Angelo, 1990; Summers, 2000).

Fleming et al. (1985) identified two types of registrants at Clemson University: those that dropped classes habitually or unnecessarily. The Fleming et al. (1985) study motivated Hagedorn et al. (2007) to further research the shopping of courses, as in the process of dropping and adding courses during the institutional registration period. Two types of shoppers were specifically examined: cyclic shoppers, who dropped courses and added a replacement course; and bulk shoppers who presumably had no intention of completing all courses for which they had registered. Hagedorn et al. (2007) associated course-taking patterns with rational choice theory, assuming that students base their actions and decisions on a cost-benefit analysis. Specifically, students may drop a course if they recognize early that their likelihood of success is limited, and replace it with an easier course, or they may shop for courses perceived to provide the highest relative pay off with a better time, teacher, or grade. The results of the Hagedorn et al. (2007) study reported that while occasional course shopping did not appear to impact academic performance, frequent cyclic shoppers were more likely to have weak GPA's and low course

completion rates. Additionally, excessive registration changes could waste administrative and staff resources, particularly if the process is not entirely online (Hagedorn et al., 2007).

Students indicate a stronger investment in their college intent when they register for higher credit loads, as credit load can be considered a material indicator of investment (Okun, Benin, & Brandt-Williams, 1996; Okun, Ruehlman, & Karoly, 1991). Merit aid is often awarded with full-time enrollment requirements, which could lead to increases in persistence and timely degree completion (Bound et al., 2012; DesJardins et al., 1999, 2002; Scott-Clayton, 2011).

Petschauer and Wallace (2005) recommended a personalized approach to course registration, and noted 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. Course clustering, block scheduling, and learning communities are commonly initiated to encourage a ready-made support structure, both academically and personally (Harper & Quaye, 2009). While Moore and Carpenter (1985) suggested special pre-enrollment processes for underprepared freshmen, Mangold et al. (2003) specifically recommended block registration partnered with a mentoring program to strengthen social, academic integration, and ultimately persistence (Lotkowski et al., 2004).

A lesser-known enrollment phenomenon within the realm of student retention is “stopping out” or a temporary break in attendance (Bettinger, 2004; Pascarella & Terenzini, 2005; Stratton et al., 2007). Stratton et al. (2007) noted that many students appear to be dropouts based on point-in-time measures, but often re-enroll soon afterward and continue to pursue college studies. Bettinger (2004) noted that needy, Pell-eligible students appear to be more likely to “stop out,” and this activity greatly reduces the likelihood of future degree completion even if they do return later (Pascarella & Terenzini, 2005).

Beyond the examination of registration processes and the literature on student success, however, it is important to recognize the general importance for students to be able to register for the courses they need. In the most recent Noel-Levitz (2013a) satisfaction and priorities report, students indicated their need to register for necessary classes as the number-one challenge they face. The alarm, however, is that while registration effectiveness ranked fourth in importance for students, campus personnel rated this concern as tenth with only campus life issues lower in their ranking. Also disconcerting, is that obstacles of institutional procedures, like selecting appropriate courses in the necessary sequence to fulfill graduation requirements, have been listed in the literature as problems for nearly thirty years (Anderson, 1985). Perhaps one method to alleviate this challenge is to encourage strategic, major-related dual enrollment, as is discussed in the following section.

### Academics and Course Completion

Many students have earned course credits before they formally matriculate into an institution, whether through Advanced Placement (AP) or dual enrollment credits (DesJardins et al., 2002; Saltarelli, 2010). These students may be more likely to integrate quicker with the institution and to persist, since they may have become familiar with the freedom and challenges associated with the college environment (DesJardins et al., 2002; Porter, 2003; Saltarelli, 2010; Tinto, 1975). Porter (2003) found that students with dual enrollment credit had higher GPAs than their non-dual-enrolled counterparts, although he also recognized that the high school GPAs and college entrance exam scores were higher in the first place (Saltarelli, 2010).

Most students that opt to leave college do so for reasons other than academic failure (Tinto, 1982). In fact, research has indicated that below-average students are often more inclined

or motivated to persist than even those with excellent academic records (St. John et al., 1994). Nevertheless, mediocre or failing grades do still have a significant impact on attrition, whether by institutional or student decision (Allen, Robbins, & Sawyer, 2010; Bean & Metzner, 1985; Mattern et al., 2015; Okun et al., 1996; St. John et al., 1994; Stratton et al., 2007), and grades may actually be the single best forecasters of student persistence and degree completion (Pascarella & Terenzini, 2005; Westrick et al., 2015). However, even though a higher GPA has been shown to lower the chance of attrition, its role as a predictor of retention may be reduced over time (DesJardins et al., 1999).

Students with more challenging majors (and by extension, harder coursework) may not be as academically successful (Condon et al., 2011; Goldman & Widawski, 1976; V. E. Johnson, 1997; Strenta & Elliot, 1987; Westrick et al., 2015). This may be because they were not academically or psychologically prepared for the workload expected, but it could also be due to their lack of commitment to the chosen major program (Condon et al., 2011; DesJardins et al., 2002). As Tinto (1987) explained, however, it would be truly surprising if all new 18-year-old freshmen had clearly planned academic and career goals. Regardless, institutions should make the effort to provide students with challenging, satisfying experiences and high expectations, which often come in the form of complex major-related courses (Kuh, Cruce, Shoup, Kinzie, & Gonyea, 2008; Tinto, 2012).

### The Freshman Student and Institutional Practices

The first year of college, during critical periods like admission, orientation, or during the first transitional semester, has long been classified as a key period when many students decide to leave an institution (National Center for Education Statistics, 2014; Tinto, 1987, 2006, 2012;

Upcraft, Gardner, & Barefoot, 2005; Xu, 2016). In fact, the attrition rate across all levels of institutions has hovered around 45% since the 1960s (National Center for Education Statistics, 2014). It is during these critical introductory phases that institutions (and those investigating retention rates) need to recognize the “educational responsibility they have assumed in admitting these students” (Tinto, 1985, p. 41), especially in the event that the students were lacking in academic preparation in the first place (Astin, 2006). An emphasis on targeted retention needs to be embedded in the fabric of the institution, and linked to other institutional policies to help students recognize the university’s commitment to them and support in the realization of their academic goals (Bean, 2005; Bowen et al., 2009; Braxton et al., 2004; Braxton et al., 2008; Cohen, Brawer, & Kisker, 2013; Hossler, Ziskin, Gross, et al., 2009; J. Kim, 2015; Kuh et al., 2005; Mattern et al., 2015; National Center for Education Statistics, 2014; Noel-Levitz, 2013b).

### Orientation

Retention research has consistently stressed the importance of orientation programs to help students adapt to an institution (Braxton et al., 2004; Lotkowski et al., 2004; Noel-Levitz, 2013b; Tinto, 1982, 1987, 1993, 2012; Titley, 1985; Valverde, 1985; Webster & Showers, 2010), and the majority of institutions state that this experience is a requirement for their entering students (College Board, 2009). Research has indicated that campuses with lower participation in orientation activities also have lower retention rates in general (Hossler, Ziskin, & Gross, 2009). For first-generation students, especially, orientation experiences and relationships with precollege program staff have been shown to make the difference in their preparation for college (Engle, Bermeo, & O'Brien, 2006; Titley, 1985; Valverde, 1985). Furthermore, “deliberate and

intentional efforts to assimilate new students into the institutional culture and environment are essential if institutions are to expect transitional students to thrive” (Hunter, 2006, p. 10).

The earlier that a freshman student is introduced to and participates in activities that have educational purpose, the more likely they are to have positive academic outcomes and persist to the second year (Kuh et al., 2008; Kuh et al., 2005). To serve this need, institutions should invest in and provide multiple ways for students to channel their energy toward appropriate curricular or extracurricular educational activities. Common activities of this nature include academic support (tutoring and workshops) or experiential learning (Cruce et al., 2006; Kuh et al., 2008).

### Academic Advising

Consistent, required academic advising is actively beneficial to persistence and degree completion, especially for students who enter higher education academically underprepared (Anderson, 1985; Bahr, 2008; College Board, 2009; Crockett, 1985; Hossler & Anderson, 2005; Ishler & Upcraft, 2005; M. C. King & Kerr, 2005; Kuh, 2005; Lotkowski et al., 2004; Noel-Levitz, 2013a, 2013b; Pascarella & Terenzini, 2005; Soria & Stubblefield, 2015; Upcraft et al., 2005). In particular, Noel-Levitz (2013a) shared a satisfaction and priorities report that listed academic advising as critically important for both students and campus personnel. General interaction with faculty and academic personnel may also impact student persistence, particularly in relation to the predictors of caring instruction, students known and valued, and mentoring, which supports Tinto’s (1993) interactionalist theory of student departure (Barnett, 2011; Rendon, 1994, 2002; Rendon et al., 2000).

Many students enter higher education at a disadvantage, whether the challenge is socioeconomic or a lack of overall support and preparation. Often seen as an agent of inequality,

high school tracking systems were significantly eliminated in the 1970s and essentially replaced with efforts by students to track themselves (Arum & Roksa, 2011). According to Arum and Roksa (2011), high school students from disadvantaged backgrounds are less likely to select rigorous college-preparatory classes than are their wealthier classmates. This secondary school phenomenon translates to the university level whereby incoming freshmen with limited preparatory academic advisement or retention-based resources may be more likely to drop out.

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” (p. 39) before the students have a chance to turn negative. This concept of “intrusive” initiatives is further supported by student engagement advocates, as long as these programs and practices are meaningful, high-quality, and customized for the student population being served (Hossler & Anderson, 2005; Kuh, 2005; Kuh et al., 2008; Kuh et al., 2005; Pike, Kuh, McCormick, Ethington, & Smart, 2011; Webster & Showers, 2010).

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 (Kuh et al., 2005; Levitz et al., 1999; Pike et al., 2011; Soria & Stubblefield, 2015). Institutions should be proactive with their support programs and anticipate student difficulties in general procedures, as the best manner to stimulate student retention is to eradicate

problems or obstacles before they begin (Anderson, 1985; Bean, 2005; Cueso, 2005; Hunter, 2006; Mattern et al., 2015; Soria & Stubblefield, 2015). 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" (Cueso, 2005, p. 43). Furthermore, student success is often driven by the students' own expectations, so advising efforts should provide students with challenging and satisfying experiences like registration in complex courses within their major (Kuh et al., 2008; Tinto, 2012).

### Why Retention Matters to an Institution

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). While a significant amount of research on student retention has been conducted with regard to student academic and social attributes, few studies have examined how institutional culture, behavior, and policies relate to retention (Bean, 2005; Gansemer-Topf & Schuh, 2005; Mattern et al., 2015; Tinto, 1993). Successful retention initiatives can influence a student's decision to persist at a particular institution, which in turn provides measurable indicators of student satisfaction (Berger & Braxton, 1998; 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 rate of retention there (Bean, 2005; Hossler, 1991; Lenning, 1982; Mattern et al., 2015; Noel, Levitz, & Saluri, 1985).



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 - an issue later echoed by Mattern et al. (2015). Furthermore, by absorbing this effort as an institution-wide priority, identifying this need 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; Bean, 2005; Dolence, 1991; Engstrom & Tinto, 2008; Forsman et al., 2015; Hossler, Ziskin, & Gross, 2009; J. Kim, 2015; Kuh et al., 2005; Levitz et al., 1999; Mattern et al., 2015; National Center for Education Statistics, 2014; Tinto, 2012; Westrick et al., 2015). It is critical however, that institutional leadership acknowledges the importance of cooperation and collaboration among academic and student affairs divisions, as this lack of solidarity when attempting retention programs is considered one of the main reasons for strategic and operational disappointments (Dolence, 1991; Hossler, 1991; Hossler, Ziskin, & Gross, 2009; Kuh et al., 2005; Tinto, 2012). Essentially, the academic aspects of student retention should be evaluated along with tactical, operational, and administrative areas like course registration, as complications in these areas are common reasons to drop out (Bean, 2005; Dolence, 1991; Kuh et al., 2005; Levitz & Hovland, 1998; Mattern et al., 2015).

Exemplary student retention programs link retention initiatives with other institutional strategies to help student gains toward educational goals, particularly in relation to Tinto's interactionalist model of student persistence (Bowen et al., 2009; Braxton et al., 2004; Braxton et al., 2008; Lotkowski et al., 2004; Tinto, 1975). Furthermore, "programs must consider individual needs to be effective" (Braxton et al., 2004, p. 54). Petschauer and Wallace (2005) recommend personalizing the course registration process, similar to the proposed method of the current

study, as a means of reducing or eliminating unnecessary anxiety for students during their first academic experience. Petschauer and Wallace (2005) 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. Petschauer and Wallace (2005) maintain that by appearing to wait until the last minute to make decisions and solve resource problems, institutions could be sending negative messages to the students.

Federal and state agencies, including those within Tennessee, have begun incorporating degree-completion rates in their methodology for resource and financial aid allocations, instead of simply funding institutions based on their enrollment numbers (Fain, 2013; D. Kim, Saatcioglu, & Neufeld, 2012; Tennessee Higher Education Commission, 2010, 2011a, 2011b; Tinto, 2012). While the Complete College Tennessee Act initiative is progressive and aims to improve efficiency and degree production, it also forces institutions to be competitive in improving the quality of their academic programs and retention platforms (Fain, 2013; Tennessee Higher Education Commission, 2011b). Furthermore, it is also important to note that while many institutions have a designated retention coordinator, most of these individuals have minimal authority or funding to implement or expand necessary retention programs (College Board, 2009), an issue that Hossler, Ziskin, and Gross (2009) have addressed as critical to retention initiative success. From a public relations perspective, first- to second-year persistence rates could impact the public ranking of individual institutions against their peers, further stressing the importance of early retention achievement (College Board, 2009).

## Summary

This chapter has provided a literature review related to the many facets of student retention in higher education. The differing levels of preparation for postsecondary education, the anxiety of new college students, and the need for early intervention plans in relation to their impact on retention was discussed in depth. Furthermore, the importance of student satisfaction and collaboration across university academic and student affairs divisions was stressed. Finally, the significance of meeting the needs of individual students was evaluated, as was the relevance of portraying an organized institutional culture. All of these factors are critical to developing and maintaining a student-centered retention strategy.

Each of the topics covered in this literature review highlight the diverse and complex needs of students to be retained for their second year of college study and to be academically successful overall. These elements are addressed in the data collection and analysis in the following chapters, alongside the registration methods and habits of first-semester college students. When considered holistically, the most important factors and predictors of success may be identified.

## CHAPTER III

### METHODOLOGY

The purpose of this study was to investigate the relationships between designated student characteristics and course registration methods during the freshman orientation process for three cohorts of entering freshman students. The results found within this research were analyzed to determine if certain combinations of these characteristics and/or registration methods ultimately led to positive academic outcomes and increased student retention rates. An additional qualitative examination considered the operational elements of the preregistration process and their perceived impact.

The three cohorts were registered in their respective courses in different ways. Members of the first cohort (Baseline 2010 Comparison Group) independently self-selected and registered for courses that were available at the time of their orientation session. Members of the second and third cohorts (2011 and 2012 Comparison Groups) were assigned a course schedule based on their successful completion of an AIQ prior to orientation, and many course sections were purposely restricted to their cohort's enrollment. The 2011 Comparison Group was the first cohort to complete the preregistration process. The preregistration process was slightly different for the 2012 Comparison Group: the staff involved in the process had prior-year experience, additional restricted course sections were provided, course registration for the general student population was closed, and freshman students included in the preregistration process were limited in their ability to alter their course schedule following their orientation session. The study

compared the three groups to determine if the initial method of registration was related to their rate of academic success and retention. An additional qualitative examination considered the operational elements of the preregistration process.

Four research questions provided the direction for this study:

1. What combination of student characteristics best predicts first-year student success at UTC as measured by six academic outcome variables? The student characteristics include the following (also, see Appendix A, Variables Analysis):
  - a. The style of first-time course registration (independent self-selected registration versus personalized preregistration)
  - b. The comparison grouping (as determined by the course registration style and amount of course schedule changes)
  - c. Permanent residency (county)
  - d. Gender
  - e. Academic college
  - f. Academic program
  - g. ACT or SAT composite score and Math and English ACT sub-scores
  - h. Dual enrollment and Advanced Placement (AP) credits earned
  - i. Pell Grant eligibility
  - j. Financial Aid Satisfactory Academic Progress status

The academic outcomes include the following:

1. Semester GPA
2. Semester attempted credit hours

3. Semester earned credit hours
  4. Overall GPA
  5. Overall attempted credit hours
  6. Overall earned credit hours
2. Of the six academic outcome variables, what combination best predicts first-year student retention at UTC (with retention measured as Retained – yes or no)?
  3. Does the initial course registration method (independent self-selected registration versus personalized preregistration) used have a relationship with first-year student retention at UTC (with retention measured as Retained – yes or no)?
  4. Is there a perceived impact of the preregistration process on administrative policy and procedure?

#### Statement of Hypothesis in the Null Form

Listed below are the null hypotheses for this study.

1. No combination of student characteristics will best predict first-year student success at UTC as measured by one or more six academic outcome variables (see Appendix A, Variables Analysis).
2. Of the six academic outcome variables, none of the combinations will best predict first-year student retention at UTC (with retention measured as Retained – yes or no).
3. The initial course registration method (independent self-selected registration versus personalized preregistration) used will not have a relationship with first-year student retention at UTC (with retention measured as Retained – yes or no).

## Description of Population and Sample

The population for the quantitative portion of this study included all entering freshmen who began registration in summer 2010, 2011, or 2012 as part of a freshman orientation session at the University of Tennessee at Chattanooga. Any students who were voluntarily marked “confidential” in the student information system were excluded from the sample per the federal regulations of the Family Educational Rights and Privacy Act (FERPA) of 1974. Also excluded were any freshman students who did not participate in the orientation process, as these students would not have participated in the same registration process as the students sampled. The final excluded groups included honors program students and student athletes, as they would have received personalized preregistration during both evaluated years as part of their program benefits. The total number of students included in the sample was 6,375. The population for the qualitative interview process included five administrative staff participants who had all experienced the process of course registration for first-year students, although indirectly. All participants were selected by theoretical sampling based on their perspective as administrators within their academic and student service departments.

## Identification of Variables

The primary attribute independent variables for this study included the style of first-time registration and the comparison groupings. Additional attribute independent, student characteristic variables included the student’s permanent residency (county), gender, academic college, academic program, former major (if applicable), ACT composite score (or SAT, if applicable), math and English ACT sub-scores, dual enrollment and Advanced Placement (AP) credits earned, Pell Grant eligibility, and Financial Aid Satisfactory Academic Progress status.

The dependent variables were the six selected academic outcomes including semester and overall GPA; semester and overall attempted credit hours; and semester and overall earned credit hours.

### Data Collection

In addition to the students' registration schedules, the student information system (Banner 8.6.6, 2014) was the source of all extant data in relation to each student's admission application, registration behavior, and academic outcome history. The database program (Argos 4.2.5.368, 2013) provided an organized method of extracting the student data into user-friendly reports for detailed sorting, review, and analysis.

Several tests were conducted to ensure that data were collected accurately, including random review to compare data on the Argos reports provided against the same information within the Banner student information system. UTC Banner Student Systems Analysts assisted with the initial collection of data by developing detailed reports providing results only relevant to the students in the sample and to the academic semesters indicated. These results were limited to the predetermined student characteristics and academic outcome variables listed in Chapters I and III.

Data collection for the constructivist grounded theory component of this study was completed via interviews. The interviews were transcribed, and transcription data were organized into files by participant. Further details on this process are outlined in the following sections.

### Research Design

For the quantitative portion of this mixed-methods ex-post facto study, the researcher designated summer 2010 freshman orientation students as a Baseline 2010 Comparison Group,



as these students developed their course schedule independently for their first fall semester from the list of available courses. In 2011 and 2012, all incoming freshmen were preregistered for their first fall semester according to their submission of Academic Interest Questionnaires (AIQs); these groups were designated as the 2011 Comparison Group and 2012 Comparison Group, respectively.

The research for this portion of the study did not include direct contact with human subjects. The researcher used a preexisting data set, which was held confidential. As a university administrator, the researcher had access to all relevant data. With Institutional Review Board (IRB) approval, the following steps were taken to collect and evaluate data elements:

1. Baseline 2010 Comparison Group

- a. Compiled data elements of general student data: student ID, student's permanent residency (county), academic college, Academic program, former major (if applicable), ACT composite score (or SAT, if applicable), math and English ACT sub-scores, dual enrollment and Advanced Placement (AP) credits earned, Pell Grant eligibility, Financial Aid Satisfactory Academic Progress status, and confidentiality indicator provided by the student information system. Student names were excluded to ensure confidentiality.
- b. Compiled data elements of complete fall 2010, spring 2010/2011, and fall 2010/2011 schedules and academic history – subjects, course numbers, attempted credit hours, earned credit hours, semester GPAs, institutional GPAs, and overall GPAs.

2. 2011 Comparison Group and 2012 Comparison Group

- a. Compiled data elements of general student data: student ID, student's permanent residency (county), gender, academic college, academic program, former major (if applicable), ACT composite score (or SAT, if applicable), math and English ACT sub-scores, dual enrollment and Advanced Placement (AP) credits earned, Pell Grant eligibility, Financial Aid Satisfactory Academic Progress status, and confidentiality indicator provided by the student information system. Student names were excluded to ensure confidentiality.
  - b. Compiled data elements of complete fall 2011/2012, spring 2012/2013, and fall 2012/2013 schedules and academic history – subjects, course numbers, attempted credit hours, earned credit hours, semester GPAs, institutional GPAs, and overall GPAs.
  - c. Students were permitted to make changes to their course schedules after the preregistration process. Students were divided into four groups (2011A, 2012A, 2011B, 2012B) once the level of class schedule change was determined by data review (+/- 50% change from the original schedule). 2011A & 2012A Comparison Groups were comprised of the students that changed their schedules 50% or more from its original state. 2011B & 2012B Comparison Groups were comprised of the students that changed their schedules less than 50% from its original state.
3. Students were de-identified, and all student IDs were replaced with a random identification number associated with their designated group.
  4. Reports were uploaded and migrated through Excel, and then analyzed appropriately in the Statistical Package for Social Science (SPSS).

The qualitative portion of this study included a program evaluation of the AIQ, along with interviews of five administrative staff members indirectly involved in the preregistration process. The participants were provided with an overview of retention data and other results from the quantitative analysis in this paper, and were asked to comment on this data. The interviews were recorded and provided to the researcher for review, coding, and further analysis. Since constructivist grounded theory involves an inductive progression of flexible guidelines, consideration of the researcher's view, and a deeper learning experience of the process being studied, a conceptual map was not developed (Charmaz, 2006; Creswell, 2013).

To analyze the collected data from the interviews, the researcher read the recorded interview transcripts and made notes in the margin to form initial codes. Following a more in-depth reflection of the initial codes, open coding categories were delineated and then axial coding classification was conducted. Next, the data were interpreted through selective coding to develop a "story" from the interview responses (Creswell, 2013).

Table 1 presents the analyses used to test the null hypotheses in relation to the three quantitative questions. As indicated for Research Question 1, logistic regression was completed for all independent variables (student characteristics and registration methods). In particular, one regression was run for each dependent variable/academic outcome, using the same independent variables for each regression. In each case, the researcher noted the following:

1. Which model best predicts each dependent variable?
2. Does assigning classes improve prediction for the dependent variable measure of success?

Table 1 Research Questions, Null Hypotheses, and Statistical Methodology

<b>Research Question</b>	<b>Null Hypothesis</b>	<b>Statistical Methodology</b>
1. What combination of student characteristics best predicted first-year student success at UTC as measured by six academic outcome variables (see Appendix A, Variables Analysis)?	No combination of student characteristics best predicted first-year student success at UTC as measured by six academic outcome variables.	Logistic regression
2. Of the six academic outcome variables, what combination best predicted first-year student retention at UTC (with retention measured as Retained – yes or no)?	Of the six academic outcome variables, none of the combinations best predicted first-year student retention at UTC (with retention measured as Retained – yes or no).	Stepwise logistic regression
3. Did the initial course registration method used have a relationship with first-year student retention at UTC (with retention measured as Retained – yes or no)?	The initial course registration method used did not have a relationship with first-year student retention at UTC (with retention measured as Retained – yes or no).	Pearson’s Chi-square
4. Was there a perceived impact of the preregistration process on administrative policy and procedure?		Initial, Open, and Selective coding

If one of the independent variables was found to not be a significant predictor, it was eliminated from additional study, and the process continued with the remaining predictors. It is important to stress that only the registration methods have been manipulated as independent variables. All other independent variables were combinations of characteristics that commonly define the entering freshmen of UTC.

Research Question 2 was investigated via stepwise logistic regression as well. At this point, the academic outcome variables were considered independent variables with the dependent variable of retention. The backward stepwise method was used for Research Question 2 to determine the combination of outcome variables that best predicts first-year student retention.

Research Question 3 was analyzed using the Pearson's Chi-square to determine the relationship between the initial course registration method and first-year student retention. The dependent variable was the cohort and the independent variable was the retention indicator (retained versus not retained) for the spring to fall semesters.

Research Question 4 was considered through a review and coding process of the qualitative interviews. A story was developed from the output and woven into the narrative inquiry methodology of the researcher's historical context and personal experience of the process. Following the evaluation of the data collected, the researcher considered the institutional implications of continuing the current preregistration process, modifying its structure, or abandoning the new process altogether. This data analysis and formal discussion continues in the subsequent chapter.

## CHAPTER IV

### FINDINGS

The purpose of this research was to investigate the relationships between designated student characteristics and course registration methods during the freshman orientation process. The research analysis results were reviewed to determine if certain combinations of these characteristics and/or registration methods ultimately led to positive academic outcomes and increased student retention rates. This chapter provides relevant data, descriptive statistics, categorical descriptive information, and logistic regressions of the following: UTC GPA, term credits attempted and earned, overall GPA, overall attempted credit hours and earned, and retention. Finally, a Pearson's Chi-square table is provided to highlight the retention data stemming from the style of first-time registration.

#### Descriptive Statistics

Throughout the three years evaluated, 81.3% of students were either from middle Tennessee or eastern Tennessee and 57.9% were female. The majority of students (53.7%) were enrolled in the College of Arts and Sciences and 47.7% majored in programs aligned with the category Pre-Major, Non-Degree, Education, Health and Human Performance (HHP), and Professional Studies. In terms of Financial Aid, 63.9% were not Pell grant eligible and 99% were making Satisfactory Academic Progress (SAP). Among the 2011 and 2012 cohorts, 68.1% of

students changed their schedules less than 50% of the time. Frequencies and percentages of the categorical variables are provided in extensive detail in Table 2 below.

Table 2 Frequencies and Percentages for Categorical Descriptive Information by Admission Year

	2010 cohort		2011 cohort		2012 cohort	
	<i>n</i>	%	<i>n</i>	%	<i>n</i>	%
<b>Demographic</b>						
<b>Residency</b>						
West Tennessee	290	15	321	15	368	16
Middle Tennessee	768	40	917	42	985	43
East Tennessee	790	41	870	40	858	37
Out of state	68	4	73	3	67	3
<b>Gender</b>						
Male	817	43	905	42	959	42
Female	1099	57	1276	59	1319	58
<b>College</b>						
Arts and Sciences	1064	56	1189	55	1173	52
College of Business	218	11	247	11	266	12
Health / Education / Professional Studies	498	26	565	26	673	30
Engineering and Computer Science	136	7	180	8	166	7
<b>Program</b>						
Engineering, Business, Fine Arts	422	22	500	23	513	23
Pre-major, Non-Degree, Education, HHP, Professional Studies	925	48	1033	47	1085	48
Liberal Arts, Social Sciences, Physical Sciences	569	30	648	30	680	30
<b>Pell Grant eligibility</b>						
Yes	692	36	793	36	812	36

	2010 cohort		2011 cohort		2012 cohort	
No	1224	64	1388	64	1466	64
<b>SAP status</b>						
Satisfactory	1913	100	2181	100	2278	0
Not satisfactory	3	0	0	0	0	0
<b>Schedule changes</b>						
Schedule changed more than 50% from original state	-	-	774	36	648	28
Schedule changed less than 50% from original state	-	-	1407	65	1630	72

*Note.* Due to rounding error, some percentages may not sum to 100%.

In 2010, the average institutional credits attempted were  $Mean (M) = 14.40$  with  $standard\ deviation (\sigma) = 1.70$ , the average institutional earned credits was  $M = 11.01$  with  $\sigma = 4.24$ , and the average institutional GPA was  $M = 2.59$  with  $\sigma = 0.95$ . In 2011, the average institutional credits attempted was  $M = 14.49$  with  $\sigma = 1.71$ , the average institutional earned credits was  $M = 11.31$  with  $\sigma = 4.19$ , and the average institutional GPA was  $M = 2.65$  with  $\sigma = 0.95$ . In 2012, the average institutional credits attempted was  $M = 14.11$  with  $\sigma = 1.65$ , the average institutional earned credits were  $M = 11.97$  with  $\sigma = 3.99$ , and the average institutional GPA was  $M = 2.67$  with  $\sigma = 0.94$ . Table 3 presents the descriptive statistics of the continuous variables (the average institutional attempted credits, the average institutional earned credits, and the average institutional GPA) for the three cohorts.



Table 3 Means and Standard Deviations for Continuous Descriptive Information by Admission Year

Continuous Variables	2010 cohort		2011 cohort		2012 cohort	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
The average institutional attempted	14.40	1.70	14.49	1.71	14.11	1.65
The average institutional earned	11.01	4.24	11.31	4.19	11.97	3.99
The average institutional GPA	2.59	0.95	2.65	0.95	2.67	0.94

### Research Question 1

What combination of student characteristics best predicted first-year student success at UTC as measured by six academic outcome variables? These academic outcome variables are addressed in the discussion in the following order:

1. Semester GPA
2. Semester attempted credit hours
3. Semester earned credit hours
4. Overall GPA
5. Overall attempted credit hours
6. Overall earned credit hours

In order to answer Research Question 1, six multiple linear regressions were conducted with one analysis for each of the six academic outcome variables. Student characteristics included the following variables: residency, gender, ACT/SAT score composite, English readiness, math readiness, Pell Grant eligibility, program, college, SAP status, dual enrollment status, and AP placement. The academic outcome variables were the dependent variables, and

the student characteristics were the independent variables. Following each initial linear regression, additional regressions were conducted with only the significant variables.

### Assumptions of Research Question 1

Prior to these analyses, each of the assumptions of the multiple linear regression was assessed for each regression model. Normality was assessed using normal P-P plots. Though the following regressions indicated a slight deviation from normality, this minor departure from perfect multivariate normality was not considered a threat. Stevens (2009) stated that when sample sizes are sufficiently large (i.e.,  $n > 30$ ), the  $F$  test is robust to violations of this assumption, a notion supported by the Central Limit Theorem. Homoscedasticity was assessed using standardized residual scatterplots. None of the residual scatterplots indicated a deviation from a random rectangular distribution and this assumption was met for each analysis (Tabachnick & Fidell, 2012). In addition, potential harms due to multicollinearity were assessed for the set of independent variables. In accordance with Stevens' (2009) suggestions, variables that have a calculated variance inflation factor (VIF) of 10 or higher may be cause for concern. However, none of the independent variables had a VIF of over 2.28 when calculated in respect to one another. Thus, no issues regarding multicollinearity were indicated. As such, the following regressions are valid models and the results may be interpreted with little to no concern.

### Semester GPA

The regression to assess the collective relationship between the student characteristics and semester GPA was conducted first. Results of this set of regressions indicated a significant model fit for students in the 2010 year ( $F(14, 3341) = 46.41, p < .001, R^2 = .16$ ), as well as those

in the 2011 year ( $F(14, 4145) = 52.13, p < .001, R^2 = .15$ ) and the 2012 year ( $F(14, 4322) = 49.07, p < .001, R^2 = .14$ ). These findings suggest that between 14% and 16% of the variability in semester GPAs can be explained using a combination of residency, gender, ACT/SAT score composite, English readiness, math readiness, Pell Grant eligibility, program, college, SAP status, dual enrollment status, and AP placement. Results of the three regressions of semester GPAs on student characteristics for each year are presented in Table 4.

Table 4 Regressions of Semester GPA on Student Characteristics for 2010, 2011, and 2012 Years

Predictor	<i>B</i>	S.E.	$\beta$	<i>t</i>	<i>p</i>
<b>2010 year (<math>R^2 = .16</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	0.09	0.05	.04	1.82	.068
East Tennessee	-0.04	0.05	-.02	-0.75	.455
Out of state	0.18	0.10	.03	1.81	.071
<b>Gender (ref: male)</b>	0.30	0.04	.14	8.46	<.001
<b>ACT / SAT Composite</b>	0.22	0.03	.19	8.34	<.001
<b>English ready</b>	-0.01	0.04	-.01	-0.30	.762
<b>Math ready</b>	0.03	0.04	.01	0.80	.426
<b>Pell Grant eligibility</b>	0.08	0.04	.04	2.34	.019
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, Business or Fine Arts	-0.04	0.05	-.02	-0.91	.364

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
Liberal Arts, Social Sciences, and Physical Sciences	0.03	0.05	.01	0.62	.534
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	0.06	0.04	.03	1.46	.146
<b>Satisfactory SAP status</b>	-1.78	0.27	-.11	-6.66	<.001
<b>Dual enrollment</b>	0.39	0.04	.16	9.97	<.001
<b>AP credits earned</b>	0.44	0.06	.13	7.55	<.001
<b>2011 year (<math>R^2 = .15</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	0.02	0.05	.01	0.42	.674
East Tennessee	0.01	0.05	.01	0.28	.779
Out of state	0.06	0.09	.01	0.70	.485
<b>Gender (ref: male)</b>	0.32	0.03	.15	10.05	<.001
<b>ACT / SAT Composite</b>	0.17	0.02	.15	7.35	<.001
<b>English ready</b>	-0.04	0.04	-.02	-0.97	.331
<b>Math ready</b>	0.03	0.03	.02	1.01	.312
<b>Pell Grant eligibility</b>	0.21	0.03	.10	6.77	<.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	-0.04	0.04	-.02	-0.88	.381
Liberal arts, social sciences, and physical sciences	0.07	0.04	.03	1.57	.117

Predictor	<i>B</i>	<i>S.E.</i>	$\beta$	<i>t</i>	<i>p</i>
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	0.03	0.04	.02	0.84	.399
<b>Satisfactory SAP status</b>	-1.55	0.17	-.13	-9.31	<.001
<b>Dual enrollment</b>	0.29	0.03	.13	8.47	<.001
<b>AP credits earned</b>	0.47	0.05	.15	9.11	<.001
<b>2012 year (<math>R^2 = .14</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	0.05	0.04	.03	1.26	.209
East Tennessee	-0.01	0.04	-.00	-0.17	.862
Out of state	0.27	0.09	.04	2.89	.004
<b>Gender (ref: male)</b>	0.25	0.03	.12	7.96	<.001
<b>ACT / SAT Composite</b>	0.14	0.02	.12	6.13	<.001
<b>English ready</b>	0.08	0.04	.04	2.11	.035
<b>Math ready</b>	0.17	0.03	.08	4.87	<.001
<b>Pell Grant eligibility</b>	0.10	0.03	.05	3.27	.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	-0.09	0.04	-.04	-2.27	.023
Liberal arts, social sciences, and physical sciences	-0.04	0.04	-.02	-1.00	.317
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	0.08	0.04	.04	1.95	.052
<b>Satisfactory SAP status</b>	0.60	0.20	.04	2.99	.003

Predictor	<i>B</i>	S.E.	$\beta$	<i>t</i>	<i>p</i>
Dual enrollment	0.45	0.05	.15	9.35	<.001
AP credits earned	0.31	0.03	.14	9.52	<.001

Note. 2010 year:  $F(14, 3341) = 46.41, p < .001, R^2 = .16$ ; 2011 year:  $F(14, 4145) = 52.13, p < .001, R^2 = .15$ ; 2012 year:  $F(14, 4322) = 49.07, p < .001, R^2 = .14$ .

Examination of the individual predictors was conducted using *t-tests*. Across all of the three models, there were many commonalities and several slight differences. In each of the three regressions, gender was a significant predictor of GPA, and females ( $M = 2.83$ ) had semester GPAs between 0.25 and 0.32 points higher than males ( $M = 2.5$ ). ACT/SAT composite readiness was significant across all three years, and those who were ready ( $M = 2.84$ ) had semester GPAs between 0.14 and 0.22 points higher than those who did not ( $M = 2.46$ ). Pell Grant eligibility was found to be a significant predictor in each of the three regressions, where participants who were eligible ( $M = 2.56$ ) tended to have semester GPA scores between 0.08 and 0.21 points lower than those who were not eligible ( $M = 2.77$ ). Dual enrollment was also significant in each of the three regressions, where those who had previously completed dual enrollment credits ( $M = 3.07$ ) had semester GPAs between 0.29 and 0.45 points higher than those who were not ( $M = 2.59$ ). Finally, having earned AP credits was a significant predictor, and those who had earned AP credits ( $M = 3.14$ ) had semester GPAs between 0.31 and 0.47 points higher than those who did not ( $M = 2.59$ ). In Table 5 below, only the significant variables were included in a secondary regression.

Table 5 Regressions of Semester GPA on Student Characteristics Initially Found to Be Significant for 2010, 2011, and 2012

<b>Predictor</b>	<b>B</b>	<b>S.E.</b>	<b><math>\beta</math></b>	<b>t</b>	<b>p</b>
<b>2010 year (<math>R^2 = .16</math>)</b>					
Gender (ref: male)	.32	.03	.15	9.34	<.001
ACT / SAT Composite	.21	.02	.18	9.21	<.001
Math ready	.03	.04	.02	.89	.373
Pell Grant eligibility	.09	.04	.04	2.54	.011
Satisfactory SAP status	-1.81	.27	-.11	-6.79	<.001
Dual enrollment	.38	.04	.16	9.76	<.001
AP credits earned	.45	.06	.14	7.81	<.001
<b>2011 year (<math>R^2 = .15</math>)</b>					
Gender (ref: male)	.33	.03	.16	10.84	<.001
ACT / SAT Composite	.16	.02	.14	8.23	<.001
Math ready	.03	.03	.01	.85	.397
Pell Grant eligibility	.21	.03	.10	6.69	<.001
Satisfactory SAP status	-1.54	.17	-.13	-9.28	<.001
Dual enrollment	.29	.03	.13	8.59	<.001
AP credits earned	.47	.05	.15	9.23	<.001
<b>2012 year (<math>R^2 = .13</math>)</b>					
Gender (ref: male)	.27	.03	.13	9.16	<.001
ACT / SAT Composite	.15	.02	.13	7.50	<.001

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
Math ready	.19	.03	.09	5.57	<.001
Pell Grant eligibility	.11	.03	.05	6.63	<.001
Satisfactory SAP status	.62	.20	.04	3.09	.002
Dual enrollment	.44	.05	.15	9.22	<.001
AP credits earned	.31	.03	.14	9.44	<.001

Gender continued to be a significant variable across all cohorts, as did the ACT/SAT composite score and the completion of dual enrollment and AP credits. Comparable to the previous regression, Satisfactory Academic Progress status was only significant in the 2010 and 2011 cohorts, and math readiness was only significant in the 2012 cohort. In the first regression, Pell Grant eligibility was only significant in the 2011 cohort, but the second regression resulted in significance for both the 2011 and 2012 cohorts when other variables were excluded.

#### Semester Attempted Credit Hours

The regression utilized to assess the collective relationship between the student characteristics and semester attempted credit hours was conducted next. Results of this set of regressions indicated a significant model fit for students in the 2010 year [ $F(14, 3341) = 18.04, p < .001, R^2 = .07$ ], as well as those in the 2011 year [ $F(14, 4145) = 16.03, p < .001, R^2 = .05$ ] and the 2012 year [ $F(14, 4322) = 20.24, p < .001, R^2 = .06$ ]. These findings suggest that between 5% and 7% of the variability in the number of semester attempted credit hours can be predicted using a combination of residency, gender, ACT/SAT score composite, English readiness, math readiness, Pell Grant eligibility, program, college, SAP status, dual enrollment status, and AP



placement. Results of the three regressions of attempted semester credits on student characteristics for each year are presented in Table 6.

Table 6 Regressions of Semester Attempted Credit Hours on Student Characteristics for 2010, 2011, and 2012

<b>Predictor</b>	<b>B</b>	<b>S.E.</b>	<b><math>\beta</math></b>	<b>t</b>	<b>p</b>
<b>2010 year (<math>R^2 = .08</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	0.03	0.09	.01	0.33	.744
East Tennessee	-0.55	0.09	-.16	-6.43	<.001
Out of state	0.03	0.17	.00	0.19	.851
<b>Gender (ref: male)</b>	0.12	0.06	.04	1.97	.049
<b>ACT / SAT Composite</b>	0.16	0.05	.08	3.48	.001
<b>English ready</b>	0.04	0.07	.01	0.51	.609
<b>Math ready</b>	-0.03	0.07	-.01	-0.39	.696
<b>Pell Grant eligibility</b>	0.05	0.06	.02	0.88	.380
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	0.18	0.08	.04	2.18	.029
Liberal arts, social sciences, and physical sciences	0.36	0.08	.10	4.61	<.001
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	0.06	0.08	.02	0.79	.430
<b>Satisfactory SAP status</b>	-0.33	0.46	-.01	-0.71	.477
<b>Dual enrollment</b>	-0.20	0.07	-.05	-2.95	.003

<b>Predictor</b>	<b>B</b>	<b>S.E.</b>	<b><math>\beta</math></b>	<b>t</b>	<b>p</b>
<b>AP credits earned</b>	0.54	0.10	.10	5.36	<.001
<b>2011 year (<math>R^2 = .05</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	0.15	0.08	0.04	1.88	.060
East Tennessee	-0.36	0.08	-0.10	-4.47	<.001
Out of state	-0.19	0.16	-0.02	-1.20	.228
<b>Gender (ref: male)</b>	0.29	0.06	0.08	5.21	<.001
<b>ACT / SAT Composite</b>	0.23	0.04	0.12	5.48	<.001
<b>English ready</b>	-0.08	0.07	-0.02	-1.21	.228
<b>Math ready</b>	0.03	0.06	0.01	0.60	.551
<b>Pell Grant eligibility</b>	0.13	0.06	0.04	2.45	.014
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	0.13	0.07	0.03	1.72	.086
Liberal arts, social sciences, and physical sciences	0.24	0.08	0.06	3.14	.002
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	0.07	0.07	0.02	0.93	.353
<b>Satisfactory SAP status</b>	-0.76	0.29	-0.04	-2.59	.010
<b>Dual enrollment</b>	-0.27	0.06	-0.07	-4.47	<.001
<b>AP credits earned</b>	0.13	0.09	0.03	1.47	.142
<b>2012 year (<math>R^2 = .06</math>)</b>					

<b>Predictor</b>	<b>B</b>	<b>S.E.</b>	<b>β</b>	<b>t</b>	<b>p</b>
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	-0.21	0.07	-.06	-2.93	.003
East Tennessee	-0.45	0.07	-.13	-6.20	<.001
Out of state	-0.01	0.16	-.00	-0.06	.950
<b>Gender (ref: male)</b>	0.19	0.05	.06	3.59	<.001
<b>ACT / SAT Composite</b>	0.20	0.04	.11	5.26	<.001
<b>English ready</b>	-0.03	0.06	-.01	-0.55	.584
<b>Math ready</b>	0.34	0.06	.10	5.84	<.001
<b>Pell Grant eligibility</b>	0.13	0.05	.04	2.40	.017
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	0.26	0.07	.07	3.86	<.001
Liberal arts, social sciences, and physical sciences	0.37	0.07	.10	5.11	<.001
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	0.23	0.07	.07	3.54	<.001
<b>Satisfactory SAP status</b>	0.98	0.34	.04	2.93	.003
<b>Dual enrollment</b>	0.27	0.08	.05	3.29	.001
<b>AP credits earned</b>	-0.16	0.06	-.05	-2.95	.003

Note. 2010 year:  $F(14, 3441) = 18.04, p < .001, R^2 = .07$ ; 2011 year:  $F(14, 4145) = 16.03, p < .001, R^2 = .05$ ; 2012 year:  $F(14, 4322) = 20.24, p < .001, R^2 = .06$ .

Examination of the individual predictors was conducted using *t-tests*. In each of the three models, there were many commonalities and several slight differences. In each of the three

regressions, gender was a significant predictor of attempted credit hours, and females were found to have attempted between 0.12 and 0.29 more credits in a term. ACT and SAT composite readiness was also significantly predictive each year, where those who were academically ready tended to attempt between 0.16 and 0.23 more term credits. Dual enrollment status and AP status were significant predictors for each year; however, the beta values fluctuated between positive and negative coefficients. In Table 7 below, only the significant variables were included in a secondary regression.

Table 7 Regressions of Semester Attempted Credit Hours on Student Characteristics Initially Found to Be Significant for 2010, 2011, and 2012

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>2010 year (<math>R^2 = .07</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	0.31	0.06	0.09	5.01	<.001
Out of state	0.87	0.17	0.10	5.13	<.001
<b>Gender (ref: male)</b>	0.08	0.06	0.02	1.23	.219
<b>ACT / SAT Composite</b>	0.17	0.04	0.09	4.43	<.001
<b>Math ready</b>	-0.02	0.07	-0.01	-0.28	.780
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>	0.04	0.01	0.08	4.19	<.001
Engineering, business or fine arts	0.21	0.08	0.05	2.76	.006
Liberal arts, social sciences, and physical sciences	0.20	0.08	0.05	2.51	.012
<b>Dual enrollment</b>	-0.21	0.07	-0.02	-3.11	.002

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>AP credits earned</b>	0.53	0.10	0.10	5.31	<.001
<b>2011 year (<math>R^2 = .05</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	0.16	0.08	0.05	2.01	.045
East Tennessee	-0.35	0.08	-0.10	-4.40	<.001
<b>Out of state</b>	-0.16	0.16	-0.02	-1.15	.251
<b>Gender (ref: male)</b>	0.29	0.06	0.08	5.05	<.001
<b>ACT / SAT Composite</b>	0.21	0.04	0.11	6.02	<.001
<b>Math ready</b>	0.03	0.06	0.01	0.56	.575
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>	0.01	0.01	0.01	0.58	.563
Engineering, business or fine arts	0.14	0.07	0.04	2.05	.040
Liberal arts, social sciences, and physical sciences	0.17	0.07	0.05	2.40	.017
<b>Dual enrollment</b>	-0.27	0.06	-0.07	-4.43	<.001
<b>AP credits earned</b>	0.14	0.09	0.03	1.58	.115
<b>2012 year (<math>R^2 = .06</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	-0.20	0.07	-0.06	-2.77	.006
East Tennessee	-0.45	0.07	-0.13	-6.17	<.001
Out of state	0.02	0.16	0.00	0.15	.879

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>Gender (ref: male)</b>	0.16	0.05	0.05	3.04	.002
<b>ACT / SAT Composite</b>	0.20	0.03	0.11	5.93	<.001
<b>Math ready</b>	0.33	0.06	0.10	5.75	<.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>	0.03	0.01	0.05	2.91	.004
Engineering, business or fine arts	0.34	0.07	0.09	5.11	<.001
Liberal arts, social sciences, and physical sciences	0.13	0.06	0.04	2.10	.036
<b>Dual enrollment</b>	0.28	0.08	0.06	3.51	<.001
<b>AP credits earned</b>	-0.16	0.06	-0.04	-2.84	.005

Residency remained a significant variable across all cohorts in the secondary regression, as well as ACT/SAT composite scores. The remaining significant variables carried over from the first regression to the second, with continued inconsistencies across cohorts. In particular, the student program stayed significant for the 2010 and 2012 cohorts, and the completion of dual enrollment was significant in 2011 and 2012. AP credits earned and math readiness were only significant in 2010 and 2012, respectively.

#### Semester Earned Credit Hours

The regression to assess the collective relationship between the student characteristics and semester earned credit hours was conducted next. Results of this set of regressions indicated a significant model fit for students in the 2010 year [ $F(14, 3341) = 57.09, p < .001, R^2 = .19$ ], as well as those in the 2011 year [ $F(14, 4145) = 64.70, p < .001, R^2 = .18$ ] and the 2012 year [ $F(14,$

4322) = 25.42,  $p < .001$ ,  $R^2 = .08$ ]. These findings suggest that between 8% and 19% of the variability in the number of semester earned credit hours can be predicted using a combination of residency, gender, ACT/SAT score composite, English readiness, math readiness, Pell Grant eligibility, program, college, SAP status, dual enrollment status, and AP placement. Results of the three regressions of earned semester credits on student characteristics for each year are presented in Table 8 below.

Table 8 Regressions of Semester Earned Credit Hours on Student Characteristics for 2010, 2011, and 2012 Years

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>2010 year (<math>R^2 = .16</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	0.38	0.20	.04	1.89	.060
East Tennessee	-0.66	0.20	-.08	-3.32	.001
Out of state	0.57	0.39	.03	1.47	.143
<b>Gender (ref: male)</b>	0.71	0.14	.08	4.97	<.001
<b>ACT / SAT Composite</b>	0.90	0.10	.19	8.62	<.001
<b>English ready</b>	-0.09	0.17	-.01	-0.53	.599
<b>Math ready</b>	1.38	0.16	.16	8.86	<.001
<b>Pell Grant eligibility</b>	0.46	0.14	.05	3.30	.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	0.12	0.19	.01	0.67	.505

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
Liberal arts, social sciences, and physical sciences	0.52	0.18	.06	2.87	.004
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	0.21	0.17	.03	1.22	.223
<b>Satisfactory SAP status</b>	-7.67	1.07	-.11	-7.20	<.001
<b>Dual enrollment</b>	1.26	0.16	.13	8.09	<.001
<b>AP credits earned</b>	1.42	0.23	.11	6.09	<.001
<b>2011 year (<math>R^2 = .15</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	0.10	0.18	0.01	0.57	.572
East Tennessee	-0.46	0.18	-0.05	-2.57	.010
Out of state	0.15	0.37	0.01	0.41	.681
<b>Gender (ref: male)</b>	1.12	0.13	0.13	8.77	<.001
<b>ACT / SAT Composite</b>	1.01	0.09	0.21	10.73	<.001
<b>English ready</b>	-0.08	0.16	-0.01	-0.49	.624
<b>Math ready</b>	0.91	0.13	0.10	7.07	<.001
<b>Pell Grant eligibility</b>	0.99	0.13	0.11	7.90	<.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	0.25	0.17	0.03	1.48	.139
Liberal arts, social sciences, and physical sciences	0.59	0.17	0.07	3.46	.001



Predictor	<i>B</i>	S.E.	$\beta$	<i>t</i>	<i>p</i>
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	0.39	0.16	0.05	2.42	.016
<b>Satisfactory SAP status</b>	-6.39	0.67	-0.14	-9.58	<.001
<b>Dual enrollment</b>	0.99	0.14	0.11	7.25	<.001
<b>AP credits earned</b>	1.20	0.21	0.09	5.88	<.001
<b>2012 year (<math>R^2 = .07</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	-0.10	0.17	-.01	-0.60	.549
East Tennessee	-0.56	0.18	-.07	-3.22	.001
Out of state	0.92	0.37	.04	2.49	.013
<b>Gender (ref: male)</b>	0.85	0.13	.11	6.76	<.001
<b>ACT / SAT Composite</b>	0.27	0.09	.06	2.98	.003
<b>English ready</b>	0.18	0.15	.02	1.20	.231
<b>Math ready</b>	0.69	0.14	.08	4.99	<.001
<b>Pell Grant eligibility</b>	0.51	0.13	.06	4.06	<.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	-0.11	0.16	-.01	-0.66	.507
Liberal arts, social sciences, and physical sciences	0.10	0.17	.01	0.56	.578
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	0.33	0.16	.04	2.08	.038

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>Satisfactory SAP status</b>	2.24	0.81	.04	2.77	.006
<b>Dual enrollment</b>	1.29	0.19	.11	6.62	<.001
<b>AP credits earned</b>	0.74	0.13	.08	5.53	<.001

*Note.* 2010 year:  $F(14, 3341) = 57.09, p < .001, R^2 = .19$ ; 2011 year:  $F(14, 4145) = 64.70, p < .001, R^2 = .18$ ; 2012 year:  $F(14, 4322) = 25.42, p < .001, R^2 = .08$ .

Examination of the individual predictors was conducted using *t-tests*. In each of the three models, there were many commonalities and several slight differences. In each of the three regressions, those from east Tennessee earned significantly less credits than other residencies. Those from east Tennessee tended to earn an average of 0.46 to 0.66 fewer credits than others. Gender was a significant predictor for each regression, and females were found to have earned between 0.71 and 1.12 more credits in a term. ACT and SAT composite readiness was also significantly predictive each year, where those who were ready tended to earn between 0.27 and 1.01 more term credits. Math readiness was also significantly predictive across each time, and those who were math ready tended to earn an average of 0.69 and 1.38 more credits than those who were not. Pell Grant eligibility was also significantly predictive of earned credits, where eligible students tended to earn an average of between 0.46 and 0.99 more credits than those who were not. Dual enrollment status was a significant predictor for each year, where students who were dual enrolled tended to earn an average of 0.99 to 1.29 more credits. Finally, AP status was also significantly predictive of the earned number of credits for each time point, where AP students tended to earn between 0.74 and 1.42 more credits than non-AP students. In Table 9 below, only the significant variables were included in a secondary regression.

In Table 9, all variables deemed significant in the preceding regression remained significant. In the case of the SAP status, the previous regression only found this variable to be significant in 2010 and 2011 (not 2012), as well.

Table 9 Regressions of Semester Earned Credit Hours on Student Characteristics Initially Found to Be Significant for 2010, 2011, and 2012 Years

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>2010 year (<math>R^2 = .18</math>)</b>					
Gender (ref: male)	.74	.14	.09	5.43	<.001
ACT / SAT Composite	.87	.09	.18	9.65	<.001
Math ready	1.32	.15	.15	8.67	<.001
Pell Grant eligibility	.50	.14	.06	3.56	<.001
Satisfactory SAP status	-8.04	1.07	-.12	-7.50	<.001
Dual enrollment	1.13	.16	.12	7.29	<.001
AP credits earned	1.57	.23	.12	6.72	<.001
<b>2011 year (<math>R^2 = .17</math>)</b>					
Gender (ref: male)	1.09	.12	.13	8.99	<.001
ACT / SAT Composite	1.00	.08	.21	12.66	<.001
Math ready	.87	.13	.10	6.83	<.001
Pell Grant eligibility	.97	.12	.11	7.77	<.001
Satisfactory SAP status	-6.36	.67	-.14	-9.52	<.001
Dual enrollment	.88	.13	.10	6.58	<.001
AP credits earned	1.25	.21	.10	6.09	<.001

Predictor	<i>B</i>	S.E.	$\beta$	<i>t</i>	<i>p</i>
<b>2012 year (<math>R^2 = .07</math>)</b>					
Gender (ref: male)	.90	.12	.11	7.46	<.001
ACT / SAT Composite	.28	.08	.06	3.43	.001
Math ready	.74	.14	.09	5.41	<.001
Pell Grant eligibility	.53	.13	.06	4.24	<.001
Satisfactory SAP status	2.31	.81	.04	2.86	.004
Dual enrollment	1.31	.19	.11	6.76	<.001
AP credits earned	.67	.13	.08	5.08	<.001

#### Overall GPA

The regression to assess the collective relationship between the student characteristics and overall GPA was conducted next. Results of this set of regressions indicated a significant model fit for students in the 2010 year [ $F(14, 3341) = 60.95, p < .001, R^2 = .20$ ], as well as those in the 2011 year [ $F(14, 4145) = 70.67, p < .001, R^2 = .19$ ] and the 2012 year [ $F(14, 4322) = 61.07, p < .001, R^2 = .17$ ]. These findings suggest that between 17% and 20% of the variability in GPAs can be predicted using a combination of residency, gender, ACT/SAT score composite, English readiness, math readiness, Pell Grant eligibility, program, college, SAP status, dual enrollment status, and AP placement. Results of the three regressions of overall GPA on student characteristics for each year are presented in Table 10.

Table 10 Regressions of Overall GPA on Student Characteristics for 2010, 2011, and 2012 Years

<b>Predictor</b>	<b>B</b>	<b>S.E.</b>	<b>β</b>	<b>t</b>	<b>p</b>
<b>2010 year (<math>R^2 = .20</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	0.13	0.04	.07	3.00	.003
East Tennessee	0.01	0.04	.00	0.11	.916
Out of state	0.19	0.09	.04	2.19	.029
<b>Gender (ref: male)</b>	0.32	0.03	.17	10.30	<.001
<b>ACT / SAT Composite</b>	0.19	0.02	.18	8.40	<.001
<b>English ready</b>	-0.04	0.04	-.02	-1.15	.250
<b>Math ready</b>	0.07	0.03	.04	2.06	.039
<b>Pell Grant eligibility</b>	0.12	0.03	.06	3.98	<.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	-0.09	0.04	-.04	-2.16	.031
Liberal arts, social sciences, and physical sciences	-0.01	0.04	-.01	-0.35	.726
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	0.03	0.04	.02	0.77	.439
<b>Satisfactory SAP status</b>	-1.81	0.24	-.12	-7.66	<.001
<b>Dual enrollment</b>	0.44	0.03	.21	12.89	<.001
<b>AP credits earned</b>	0.40	0.05	.13	7.75	<.001
<b>2011 year (<math>R^2 = .19</math>)</b>					

<b>Predictor</b>	<b>B</b>	<b>S.E.</b>	<b><math>\beta</math></b>	<b>t</b>	<b>p</b>
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	0.02	0.04	.01	0.42	.676
East Tennessee	-0.02	0.04	-.01	-0.39	.697
Out of state	0.08	0.08	.02	1.02	.309
<b>Gender (ref: male)</b>	0.35	0.03	.18	12.30	<.001
<b>ACT / SAT Composite</b>	0.19	0.02	.18	9.09	<.001
<b>English ready</b>	-0.03	0.04	-.02	-0.88	.378
<b>Math ready</b>	0.09	0.03	.04	2.95	.003
<b>Pell Grant eligibility</b>	0.24	0.03	.12	8.63	<.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	-0.05	0.04	-.02	-1.37	.170
Liberal arts, social sciences, and physical sciences	0.07	0.04	.04	1.94	.052
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	0.09	0.04	.05	2.38	.017
<b>Satisfactory SAP status</b>	-1.53	0.15	-.14	-10.24	<.001
<b>Dual enrollment</b>	0.29	0.03	.14	9.58	<.001
<b>AP credits earned</b>	0.40	0.05	.14	8.73	<.001
<b>2012 year (<math>R^2 = .17</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	0.07	0.04	.04	1.72	.086
East Tennessee	0.02	0.04	.01	0.39	.697

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
Out of state	0.35	0.08	.06	4.20	<.001
<b>Gender (ref: male)</b>	0.26	0.03	.14	9.17	<.001
<b>ACT / SAT Composite</b>	0.12	0.02	.12	6.06	<.001
<b>English ready</b>	0.07	0.03	.04	2.18	.029
<b>Math ready</b>	0.18	0.03	.09	5.96	<.001
<b>Pell Grant eligibility</b>	0.12	0.03	.06	4.18	<.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	-0.11	0.04	-.05	-3.15	.002
Liberal arts, social sciences, and physical sciences	-0.03	0.04	-.02	-0.89	.371
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	0.09	0.04	.05	2.53	.012
<b>Satisfactory SAP status</b>	0.56	0.18	.04	3.13	.002
<b>Dual enrollment</b>	0.43	0.04	.16	9.96	<.001
<b>AP credits earned</b>	0.34	0.03	.16	11.36	<.001

Note. 2010 year:  $F(14, 3341) = 60.95, p < .001, R^2 = .20$ ; 2011 year:  $F(14, 4145) = 70.67, p < .001, R^2 = .19$ ; 2012 year:  $F(14, 4322) = 61.07, p < .001, R^2 = .17$ .

Examination of the individual predictors was conducted using *t-tests*. In each of the three models, there were many commonalities and several slight differences. In each of the three regressions, gender was a significant predictor for each regression, and females were found to have GPAs between 0.26 and 0.35 points higher. ACT and SAT composite readiness was significantly predictive each year, where those who were ready tended to earn a GPA between

0.12 and 0.19 higher than those who were not ready. Math readiness was also significantly predictive across each time, and those who were math ready tended to have an average of 0.07 and 0.18 points higher on their GPAs. Pell Grant eligibility was significantly predictive of attempted credits, where eligible students tended to earn an average of between 0.12 and 0.24 higher GPAs. Placement in the engineering program was significantly linked with GPAs, where engineering students tended to have GPAs between 0.05 and 0.11 points lower than other students. Dual enrollment status was a significant predictor for each year as well, where students who were dual enrolled tended to earn an average of 0.29 to 0.44 points higher on their GPAs. Finally, AP status was significantly predictive of the earned number of credits for each time point, where AP students tended to earn GPAs between 0.34 and 0.40 points higher than non-AP students. In Table 11 below, only the significant variables were included in a secondary regression.

In the secondary regression, out-of-state residency continued to be significant for 2012. Gender was a significant variable across all cohorts, as was ACT/SAT composite score, Pell Grant eligibility, completion of dual enrollment, and AP credits. SAP status was still significant for cohorts 2010 and 2011, and math readiness remained significant for the 2011 and 2012 cohorts.

Table 11 Regressions of Overall GPA on Student Characteristics Initially Found to Be Significant for 2010, 2011, and 2012 Years

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>2010 year (<math>R^2 = .22</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	.12	.04	.06	2.77	.006



<b>Predictor</b>	<b>B</b>	<b>S.E.</b>	<b><math>\beta</math></b>	<b>t</b>	<b>p</b>
East Tennessee	-.01	.04	-.01	-.28	.781
Out of state	.19	.08	.04	2.27	.023
<b>Gender (ref: male)</b>	.33	.03	.18	11.32	<.001
<b>ACT / SAT Composite</b>	.18	.02	.17	9.06	<.001
<b>Math ready</b>	.08	.03	.04	2.28	.023
<b>Pell Grant eligibility</b>	.12	.03	.06	3.95	<.001
<b>Satisfactory SAP status</b>	-1.82	.23	-.12	-7.92	<.001
<b>Dual enrollment</b>	.51	.03	.24	15.31	<.001
<b>AP credits earned</b>	.38	.05	.13	7.44	<.001
<b>2011 year (<math>R^2 = .21</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	.01	.04	.00	.13	.898
East Tennessee	-.03	.04	-.02	-.83	.405
Out of state	.10	.08	.02	1.26	.21
<b>Gender (ref: male)</b>	.35	.03	.19	13.29	<.001
<b>ACT / SAT Composite</b>	.18	.02	.17	10.49	<.001
<b>Math ready</b>	.10	.03	.05	3.52	<.001
<b>Pell Grant eligibility</b>	.23	.03	.12	8.41	<.001
<b>Satisfactory SAP status</b>	-1.44	.14	-.14	-9.95	<.001
<b>Dual enrollment</b>	.39	.03	.19	13.05	<.001
<b>AP credits earned</b>	.40	.04	.14	8.90	<.001

<b>Predictor</b>	<b>B</b>	<b>S.E.</b>	<b><math>\beta</math></b>	<b>t</b>	<b>p</b>
<b>2012 year (<math>R^2 = .19</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	.07	.04	.04	1.93	.054
East Tennessee	.01	.04	.01	.27	.789
Out of state	.36	.08	.07	<.001	<.001
<b>Gender (ref: male)</b>	.28	.03	.15	10.94	<.001
<b>ACT / SAT Composite</b>	.13	.02	.13	7.56	<.001
<b>Math ready</b>	.18	.03	.10	6.34	<.001
<b>Pell Grant eligibility</b>	.12	.03	.07	4.65	<.001
<b>Satisfactory SAP status</b>	.55	.17	.04	3.20	.001
<b>Dual enrollment</b>	.42	.04	.15	10.04	<.001
<b>AP credits earned</b>	.46	.03	.23	15.99	<.001

### Overall Attempted Credit Hours

The regression to assess the collective relationship between the student characteristics and overall attempted credit hours was conducted next. Results of this set of regressions indicated a significant model fit for students in the 2010 year ( $F(14, 3341) = 33.98, p < .001, R^2 = .13$ ), as well as those in the 2011 year ( $F(14, 4145) = 50.51, p < .001, R^2 = .15$ ) and the 2012 year ( $F(14, 4322) = 102.47, p < .001, R^2 = .25$ ). These findings suggest that between 12% and 26% of the variability in the number of overall attempted credit hours can be predicted using a combination of residency, gender, ACT/SAT score composite, English readiness, math readiness, Pell Grant eligibility, program, college, SAP status, dual enrollment status, and AP

placement. Results of the three regressions of overall attempted credit hours on student characteristics for each year are presented in Table 12.

Table 12 Regressions of Overall Attempted Credit Hours on Student Characteristics for 2010, 2011, and 2012 Years

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>2010 year (<math>R^2 = .13</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	-4.84	2.28	-.05	-2.13	.033
East Tennessee	-8.93	2.27	-.10	-3.94	<.001
Out of state	-2.07	4.41	-.01	-0.47	.639
<b>Gender (ref: male)</b>	5.04	1.61	.05	3.13	.002
<b>ACT / SAT Composite</b>	4.64	1.18	.09	3.93	<.001
<b>English ready</b>	-1.89	1.92	-.02	-0.98	.326
<b>Math ready</b>	1.06	1.76	.01	0.60	.546
<b>Pell Grant eligibility</b>	4.76	1.59	.05	2.99	.003
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	-0.44	2.12	-.00	-0.21	.837
Liberal arts, social sciences, and physical sciences	0.38	2.07	.00	0.19	.854
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	0.05	1.97	.00	0.02	.982
<b>Satisfactory SAP status</b>	-39.59	12.08	-.05	-3.28	.001
<b>Dual enrollment</b>	25.59	1.76	.24	14.53	<.001

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>AP credits earned</b>	20.21	2.64	.14	7.66	<.001
<b>2011 year (<math>R^2 = .15</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	-1.69	1.43	-.03	-1.19	.236
East Tennessee	-1.27	1.43	-.02	-0.88	.377
Out of state	-2.76	2.90	-.02	-0.95	.340
<b>Gender (ref: male)</b>	4.90	1.01	.07	4.83	<.001
<b>ACT / SAT Composite</b>	4.68	0.74	.13	6.30	<.001
<b>English ready</b>	-3.75	1.23	-.06	-3.05	.002
<b>Math ready</b>	2.06	1.02	.03	2.02	.043
<b>Pell Grant eligibility</b>	5.86	0.99	.09	5.93	<.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	1.27	1.31	.02	0.97	.332
Liberal arts, social sciences, and physical sciences	5.59	1.35	.08	4.15	<.001
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	2.00	1.28	.03	1.56	.119
<b>Satisfactory SAP status</b>	-19.98	5.28	-.05	-3.78	<.001
<b>Dual enrollment</b>	15.87	1.08	.22	14.64	<.001
<b>AP credits earned</b>	17.53	1.62	.18	10.80	<.001
<b>2012 year (<math>R^2 = .25</math>)</b>					

<b>Predictor</b>	<b>B</b>	<b>S.E.</b>	<b>β</b>	<b>t</b>	<b>p</b>
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	-2.12	0.76	-.05	-2.81	.005
East Tennessee	-2.03	0.77	-.05	-2.63	.009
Out of state	5.07	1.64	.04	3.09	.002
<b>Gender (ref: male)</b>	2.13	0.55	.05	3.84	<.001
<b>ACT / SAT Composite</b>	1.93	0.40	.09	4.83	<.001
<b>English ready</b>	1.66	0.66	.04	2.52	.012
<b>Math ready</b>	1.83	0.61	.04	3.00	.003
<b>Pell Grant eligibility</b>	2.52	0.55	.06	4.58	<.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	1.17	0.71	.03	1.65	.100
Liberal arts, social sciences, and physical sciences	1.16	0.76	.03	1.53	.127
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	2.07	0.70	.05	2.95	.003
<b>Satisfactory SAP status</b>	9.71	3.56	.04	2.73	.006
<b>Dual enrollment</b>	14.28	0.86	.25	16.63	<.001
<b>AP credits earned</b>	14.02	0.59	.33	23.77	<.001

Note. 2010 year:  $F(14, 3341) = 33.98, p < .001, R^2 = .13$ ; 2011 year:  $F(14, 4145) = 50.51, p < .001, R^2 = .15$ ; 2012 year:  $F(14, 4322) = 102.47, p < .001, R^2 = .25$ .

Examination of the individual predictors was conducted using *t-tests*. In each of the three models, there were many commonalities and several slight differences. In each of the three regressions, gender was a significant predictor, and females were found to have attempted

between 2.13 and 5.04 more credits overall. ACT and SAT composite readiness was also significantly predictive each year, where those who were ready tended to attempt between 1.93 and 4.68 more overall credits. Pell Grant eligibility was also significantly predictive of overall attempted credit hours, where eligible students tended to attempt an average of between 2.52 and 5.86 more credits than those who were not. Dual enrollment status was a significant predictor for each year, where students who were dual enrolled tended to attempt an average of 14.28 to 25.59 more overall credits. Finally, AP status was also significantly predictive of the attempted number of overall credits throughout time, where AP students tended to attempt between 14.02 and 20.21 more credits than non-AP students. In Table 13 below, only the significant variables were included in a secondary regression.

Table 13 Regressions of Overall Attempted Credit Hours on Student Characteristics Initially Found to Be Significant for 2010, 2011, and 2012 Years

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>2010 year (<math>R^2 = .12</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	-4.82	2.27	-.05	-2.12	.034
East Tennessee	-8.92	2.27	-.10	-3.94	<.001
Out of state	-1.94	4.40	-.01	-.44	.659
<b>Gender (ref: male)</b>	4.87	1.59	.05	3.07	.002
<b>ACT / SAT Composite</b>	4.28	.95	.08	4.51	<.001
<b>Pell Grant eligibility</b>	4.77	1.58	.05	3.03	.002
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
Engineering, business or fine arts	-0.67	1.98	-0.01	-0.34	.001
Liberal arts, social sciences, and physical sciences	0.14	1.77	0.00	0.08	.935
<b>Satisfactory SAP status</b>	-39.58	12.07	-0.05	-3.28	.001
<b>Dual enrollment</b>	25.55	1.76	0.24	14.56	<.001
<b>AP credits earned</b>	20.23	2.63	0.14	7.69	<.001
<b>2011 year (<math>R^2 = .14</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	-1.71	1.43	-0.03	-1.20	.230
East Tennessee	-1.24	1.44	-0.02	-0.86	.389
Out of state	-2.43	2.89	-0.01	-0.84	.401
<b>Gender (ref: male)</b>	4.66	1.01	0.07	4.64	<.001
<b>ACT / SAT Composite</b>	3.76	0.61	0.10	6.15	<.001
<b>Pell Grant eligibility</b>	5.69	0.99	0.08	5.76	<.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	1.69	1.25	0.02	1.35	.176
Liberal arts, social sciences, and physical sciences	4.12	1.11	0.06	3.72	<.001
<b>Satisfactory SAP status</b>	-19.72	5.29	-0.05	-3.73	<.001
<b>Dual enrollment</b>	15.74	1.08	0.22	14.55	<.001
<b>AP credits earned</b>	17.63	1.62	0.18	10.85	<.001

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>2012 year (<math>R^2 = .24</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	-2.16	0.76	-0.06	-2.86	.004
East Tennessee	-2.13	0.78	-0.05	-2.75	.006
Out of state	5.08	1.64	0.04	3.09	.002
<b>Gender (ref: male)</b>	2.33	0.55	0.06	4.22	<.001
<b>ACT / SAT Composite</b>	2.78	0.33	0.13	8.41	<.001
<b>Pell Grant eligibility</b>	2.66	0.55	0.07	4.82	<.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	1.34	0.69	0.03	1.96	0.05
Liberal arts, social sciences, and physical sciences	-0.36	0.62	-0.01	-0.58	.559
<b>Satisfactory SAP status</b>	9.73	3.57	0.04	2.73	.006
<b>Dual enrollment</b>	14.25	0.86	0.25	16.57	<.001
<b>AP credits earned</b>	14.23	0.59	0.33	24.16	<.001

In the above secondary regression for overall attempted credit hours, east Tennessee residency was again significant for the 2010 cohort only. Gender was significant for only the 2011 and 2012 cohorts, as was Pell Grant eligibility. ACT/SAT composite scores, dual enrollment, and AP credits continued to be significant variables for all three years. Student program and SAP status were again significant only for the 2011 cohort.



## Overall Earned Credit Hours

The regression to assess the collective relationship between the student characteristics and overall earned credit hours was conducted. Results of this set of regressions indicated a significant model fit for students in the 2010 year ( $F(14, 3341) = 48.55, p < .001, R^2 = .17$ ), as well as those in the 2011 year ( $F(14, 4145) = 70.69, p < .001, R^2 = .19$ ) and the 2012 year ( $F(14, 4322) = 103.77, p < .001, R^2 = .25$ ). These findings suggest that between 17% and 26% of the variability in the number of overall earned credit hours can be predicted using a combination of residency, gender, ACT/SAT score composite, English readiness, math readiness, Pell Grant eligibility, program, college, SAP status, dual enrollment status, and AP placement. Results of the three regressions of overall earned credit hours on student characteristics for each year are presented below in Table 14.

Table 14 Regressions of Overall Earned Credit Hours on Student Characteristics for 2010, 2011, and 2012 Years

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>2010 year (<math>R^2 = .17</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	-1.59	2.28	-.02	-0.70	.484
East Tennessee	-6.17	2.27	-.06	-2.72	.007
Out of state	3.02	4.41	.01	0.68	.494
<b>Gender (ref: male)</b>	7.02	1.61	.07	4.36	<.001
<b>ACT / SAT Composite</b>	6.65	1.18	.13	5.64	<.001
<b>English ready</b>	-2.31	1.92	-.02	-1.21	.228
<b>Math ready</b>	5.69	1.76	.06	3.23	.001

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>Pell Grant eligibility</b>	5.94	1.59	.06	3.74	<.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	-0.47	2.12	-.00	-0.22	.826
Liberal arts, social sciences, and physical sciences	0.50	2.07	.01	0.24	.810
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	1.13	1.97	.01	0.57	.566
<b>Satisfactory SAP status</b>	-52.11	12.08	-.07	-4.31	<.001
<b>Dual enrollment</b>	28.25	1.76	.26	16.03	<.001
<b>AP credits earned</b>	21.33	2.64	.14	8.09	<.001
<b>2011 year (<math>R^2 = .20</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	-1.44	1.49	-.02	-0.97	.333
East Tennessee	-1.37	1.50	-.02	-0.92	.359
Out of state	-1.41	3.02	-.01	-0.47	.641
<b>Gender (ref: male)</b>	7.05	1.06	.10	6.67	<.001
<b>ACT / SAT Composite</b>	6.70	0.78	.17	8.64	<.001
<b>English ready</b>	-3.61	1.29	-.05	-2.81	.005
<b>Math ready</b>	4.55	1.06	.06	4.28	<.001
<b>Pell Grant eligibility</b>	7.63	1.03	.11	7.40	<.001

Predictor	<i>B</i>	<i>S.E.</i>	$\beta$	<i>t</i>	<i>p</i>
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	0.92	1.37	.01	0.67	.503
Liberal arts, social sciences, and physical sciences	5.62	1.40	.08	4.01	<.001
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	3.00	1.34	.04	2.25	.024
<b>Satisfactory SAP status</b>	-31.99	5.51	-.08	-5.81	<.001
<b>Dual enrollment</b>	17.71	1.13	.23	15.66	<.001
<b>AP credits earned</b>	18.67	1.69	.18	11.03	<.001
<b>2012 year (<math>R^2 = .26</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	-1.21	0.86	-.03	-1.41	.159
East Tennessee	-1.33	0.88	-.03	-1.51	.131
Out of state	7.86	1.87	.06	4.22	<.001
<b>Gender (ref: male)</b>	4.01	0.63	.09	6.37	<.001
<b>ACT / SAT Composite</b>	2.14	0.46	.09	4.71	<.001
<b>English ready</b>	1.93	0.75	.04	2.58	.010
<b>Math ready</b>	2.83	0.69	.06	4.09	<.001
<b>Pell Grant eligibility</b>	3.43	0.63	.07	5.47	<.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					

<b>Predictor</b>	<b>B</b>	<b>S.E.</b>	<b>β</b>	<b>t</b>	<b>p</b>
Engineering, business or fine arts	-0.42	0.81	-.01	-0.52	.602
Liberal arts, social sciences, and physical sciences	0.35	0.87	.01	0.41	.684
<b>College of Business / Health / Education / Engineering (ref: Arts / Sciences)</b>	2.07	.797	.05	2.60	.009
<b>Satisfactory SAP status</b>	11.67	4.05	.04	2.88	.004
<b>Dual enrollment</b>	15.97	0.98	.24	16.36	<.001
<b>AP credits earned</b>	15.34	0.67	.31	22.88	<.001

Note. 2010 year:  $F(14, 3341) = 48.56, p < .001, R^2 = .17$ ; 2011 year:  $F(14, 4145) = 70.69, p < .001, R^2 = .19$ ; 2012 year:  $F(14, 4322) = 103.77, p < .001, R^2 = .25$ .

Examination of the individual predictors was conducted using *t-tests*. In each of the three models, there were many commonalities and several slight differences. In each of the three regressions, gender was a significant predictor, and females were found to have earned between 4.01 and 7.05 more credits overall. ACT and SAT composite readiness was also significantly predictive each year, where those who were ready tended to earn between 2.14 and 6.70 more overall credits. Math readiness was another statistically significant predictor, and students who were math ready tended to earn between 2.83 and 5.69 more credits than those who were not. Pell Grant eligibility was also significantly predictive of overall earned credit hours, where eligible students tended to earn an average of between 3.43 and 7.63 more credits than those who were not. Dual enrollment status was a significant predictor for each year, where students who were dual enrolled tended to earn an average of 15.97 and 28.25 more overall credits. Finally, AP status was also significantly predictive of the earned number of overall credits throughout time, where AP students tended to earn between 15.34 and 21.33 more credits than non-AP

students. In Table 15 below, only the significant variables were included in a secondary regression.

Table 15 Regressions of Overall Earned Credit Hours on Student Characteristics Initially Found to Be Significant for 2010, 2011, and 2012 Years

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>2010 year (<math>R^2 = .17</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	-1.57	2.28	-0.02	-0.69	.490
East Tennessee	-6.17	2.27	-0.06	-2.72	.007
Out of state	2.95	4.41	0.01	0.67	.504
<b>Gender (ref: male)</b>	6.96	1.59	0.07	4.39	<.001
<b>ACT / SAT Composite</b>	5.94	1.03	0.11	5.79	<.001
<b>Math ready</b>	5.49	1.76	0.06	3.13	.002
<b>Pell Grant eligibility</b>	5.56	1.59	0.06	3.69	<.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	-0.16	2.02	-0.00	-0.08	.939
Liberal arts, social sciences, and physical sciences	-0.25	1.78	-0.00	-0.14	.890
<b>Satisfactory SAP status</b>	-52.17	12.08	0.07	-4.32	<.001
<b>Dual enrollment</b>	28.23	1.76	0.26	16.07	<.001
<b>AP credits earned</b>	21.38	2.64	0.14	8.11	<.001
<b>2011 year (<math>R^2 = .20</math>)</b>					

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	-1.49	1.49	-0.02	-1.00	.318
East Tennessee	-1.34	1.50	-0.20	-0.90	.371
Out of state	-1.36	3.01	-0.01	-0.45	.651
<b>Gender (ref: male)</b>	6.89	1.05	0.10	6.57	<.001
<b>ACT / SAT Composite</b>	5.52	0.66	0.14	8.38	<.001
<b>Math ready</b>	4.46	1.06	0.06	4.19	<.001
<b>Pell Grant eligibility</b>	7.43	1.03	0.10	1.39	.166
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	1.81	1.31	0.02	1.39	.166
Liberal arts, social sciences, and physical sciences	3.85	1.17	0.05	3.30	.001
<b>Satisfactory SAP status</b>	-31.68	5.52	-0.08	-5.74	<.001
<b>Dual enrollment</b>	17.58	1.13	0.23	15.58	<.001
<b>AP credits earned</b>	18.84	1.70	0.18	11.12	<.001
<b>2012 year (<math>R^2 = .25</math>)</b>					
<b>Residency (ref: West Tennessee)</b>					
Middle Tennessee	-1.25	0.86	-0.03	-1.45	.147
East Tennessee	-1.38	0.88	-0.03	-1.57	.117
Out of state	7.69	1.87	0.06	4.12	<.001
<b>Gender (ref: male)</b>	4.28	0.63	0.10	6.83	<.001

<b>Predictor</b>	<b><i>B</i></b>	<b><i>S.E.</i></b>	<b><math>\beta</math></b>	<b><i>t</i></b>	<b><i>p</i></b>
<b>ACT / SAT Composite</b>	2.66	0.40	0.11	6.59	<.001
<b>Math ready</b>	2.92	0.69	0.06	4.23	<.001
<b>Pell Grant eligibility</b>	3.49	0.630	0.08	5.56	<.001
<b>Academic Program (ref: Pre-major, non-degree, Education, HHP, Professional Studies)</b>					
Engineering, business or fine arts	0.05	0.79	0.00	0.06	.953
Liberal arts, social sciences, and physical sciences	-0.99	0.70	-0.02	-1.40	.161
<b>Satisfactory SAP status</b>	11.56	4.05	0.04	2.85	.004
<b>Dual enrollment</b>	15.88	0.98	0.24	16.26	<.001
<b>AP credits earned</b>	15.50	0.67	0.32	23.15	<.001

This secondary regression highlighted that out-of-state residency continued to be a significant variable for the 2012 cohort. Across all cohorts, gender, ACT/SAT composites scores, dual enrollment completion, and AP credits remained significant variables. Pell Grant eligibility remained a significant variable for the 2010 cohort, as well as the 2012 cohort. SAP status was still significant for the 2010 and 2011 cohorts, and math readiness was significant for the 2011 and 2012 groups.

#### Research Question 2

Research Question 2 asked, of the six academic outcome variables, what combination best predicted first-year student retention at UTC? The academic outcome variables include:

- a. Semester GPA

- b. Semester attempted credit hours
- c. Semester earned credit hours
- d. Overall GPA
- e. Overall attempted credit hours
- f. Overall earned credit hours

**H<sub>0</sub>2:** Of the six academic outcome variables, none of the combinations best predicted first-year student retention at UTC.

**H<sub>a</sub>2:** Of the six academic outcome variables, one of the combinations best predicted first-year student retention at UTC.

In order to examine Research Question 2, binary logistic regressions were conducted. Both of these regressions were conducted using backwards stepwise selection for the predictor variables. The predictor variables include term semester GPA, semester attempted credit hours, semester earned credit hours, overall GPA, overall attempted credit hours, and overall earned credit hours. Using backwards stepwise selection, all predictor variables are entered into the model simultaneously, and variables are removed one by one based on a non-significant contribution to the model. In the first model, the academic outcomes are assessed for an ability to predict retention from the first fall semester to the subsequent spring semester. In the second model, the academic outcomes are assessed for an ability to predict retention from the spring semester to the subsequent fall semester. Due to the non-parametric nature of the logistic regression, none of the restrictive assumptions typically associated with regression analyses required assessment (Stevens, 2009).



## Retention From Fall to Spring

Results of the first binary logistic regression indicated a significant model in step one ( $\chi^2(7) = 2695.67, p < .001$ , Nagelkerke  $R^2 = .61$ ), with the Nagelkerke  $R^2$  serving as a version of the coefficient of determination for the regression since the statistic is unable to reach its maximum associated value (Field, 2011). This model indicated that each of the six predictor variables contributed useful and unique predictive information. As such, none of the variables were removed from the model. Thus, this final model was determined to include the semester GPA, semester attempted credit hours, semester earned credit hours, overall GPA, overall attempted credit hours, and overall earned credit hours.

As indicated by the Nagelkerke  $R^2$ , approximately 61% of the variability in whether a student was retained from fall to spring may be accounted for using a logit combination of these variables. In this final model, approximately 98.20% of participants were correctly predicted to be retained versus non-retained. For the semester earned credit hours, each additional credit corresponded with an increase in likelihood of being retained by a factor of 1.50. Similarly, each overall credit attempted corresponded with an increased likelihood of retention by a factor of 1.49, while each point increase in overall GPA corresponded with a likelihood increase to be retained by a factor of 1.28. The registration method was significant in that students processed through the preregistration process were more likely to be retained by a factor of 1.91, as determined by the odds ratio (O.R.). In particular, the O.R. indicated that a student was nearly two times more likely to be retained from the fall to the spring semester if they experienced preregistration. The semester GPA, semester attempted credit hours, and the number of overall credits earned were negatively correlated with retention, meaning that an increase in either

independently corresponded with a lower likelihood of retention to spring. Results of this binary logistic regression are presented below in Table 16.

Table 16 Binary Logistic Regression to Predict Retention to Spring Using Academic Outcomes

<b>Variable</b>	<b>B</b>	<b>S.E.</b>	<b>Wald(1)</b>	<b>p</b>	<b>O.R.</b>
Semester GPA	-0.30	0.13	5.78	.016	0.74
Term credits attempted	-0.43	0.04	101.12	<.001	0.65
Term credits earned	0.40	0.04	132.03	<.001	1.50
Overall GPA	0.24	0.12	3.86	.049	1.28
Overall attempted credit hours	0.40	0.02	384.46	<.001	1.49
Overall earned credit hours	-0.27	0.02	150.49	<.001	0.76
Registration method	0.65	0.13	27.01	<.001	1.91

Note.  $\chi^2(6) = 2695.67, p < .001$ , Nagelkerke  $R^2 = .61$

#### Retention From Spring to Fall

Results of the first binary logistic regression indicated a significant model in step one ( $\chi^2(7) = 6638.66, p < .001$ , Nagelkerke  $R^2 = .61$ ); however, this model's statistics indicated that the term overall GPA variable did not contribute significantly to the predictive ability, and that the model would not significantly change with this variable's removal. As such, overall GPA was considered ineffective to predict retention to the fall semester, and was removed from the model. With this variable removed, the model statistics did not indicate a loss of predictive ability ( $\chi^2(6) = 6638.64, p < .001$ , Nagelkerke  $R^2 = .61$ ) and the final model included UTC GPA, the semester attempted credit hours, semester earned credit hours, overall attempted credit hours, and overall earned credit hours.

As indicated by the Nagelkerke  $R^2$ , approximately 61% of the variability in whether a student was retained from spring to fall may be accounted for using a logit combination of these variables (UTC GPA, the semester attempted credit hours, semester earned credit hours, overall attempted credit hours, and overall earned credit hours). In this final model, approximately 94% of participants were correctly predicted to be retained versus non-retained. For each point increase in semester GPA, students increased their likelihood of retention to spring by a factor of 1.63, while each term credit earned increased likelihood of retention by a factor of 1.12. An increase by one in the number of attempted credits overall was found to correspond with an increased likelihood of retention by a factor of 1.14. The registration method was significant in that students processed through the preregistration process were more likely to be retained by a factor of 6.00, as determined by the odds ratio (O.R.). In particular, the O.R. indicated that a student was nearly six times more likely to be retained from the fall to the spring semester if they experienced preregistration, compared to the odds of the outcome occurring in the absence of preregistration. Both the semester attempted credit hours and the number of overall credits earned were negatively correlated with retention, meaning that an increase in either independently corresponded with a lower likelihood of retention to spring. Results of this binary logistic regression are presented in Table 17 below.

Table 17 Binary Logistic Regression to Predict Retention to Fall Using Academic Outcomes

Variable	<i>B</i>	S.E.	Wald(1)	<i>p</i>	O.R.
Semester GPA	0.49	0.05	111.86	<.001	1.63
Term credits attempted	-0.17	0.02	72.20	<.001	0.84
Term credits earned	0.11	0.01	64.43	<.001	1.12
Overall attempted credit hours	0.13	0.01	668.92	<.001	1.14
Overall earned credit hours	-0.07	0.01	198.55	<.001	0.93
Registration method	1.79	0.08	515.15	<.001	6.00

Note.  $\chi^2(6) = 6638.64, p < .001$ , Nagelkerke  $R^2 = .61$

### Research Question 3

Did the initial course registration method used have a relationship with first-year student retention at UTC?

**H<sub>0</sub>3:** The initial course registration method used did not have a relationship with first-year student retention at UTC.

**H<sub>a</sub>3:** The initial course registration method used had a relationship with first-year student retention at UTC.

In order to examine Research Question 3, Pearson's Chi-square tests were performed to determine if there was a significant relationship between the initial registration method and first-year spring to fall student retention. The Likelihood Ratio was performed as an alternative test to determine significance. Next, a cross-tabulation was run to identify specific totals and rates of retention among the individual cohorts to determine if each were markedly different.

### Assumptions of Research Question 3

The total student populations used for the following tests are less than the totals outlined in Table 2 (Frequencies and Percentages for Categorical Descriptive Information by Admission Year). The Table 2 totals were determined before fall to spring student attrition. These tests used a dataset that excluded duplicates and only included students enrolled in the respective spring semesters.

#### Predicting Retention by Initial Registration Method

A Pearson's Chi-square test for association was performed to determine if there was a relationship between the initial registration method and first-year spring to fall student retention. All expected cell frequencies were greater than five. There was a statistically significant association between the initial course registration method and first-year student retention (spring to fall),  $\chi^2(2) = 83.75, p = <.001$ . Next, the Likelihood Ratio was determined as an alternative to Pearson's Chi-square, and again, all expected cell frequencies were greater than five. The Likelihood Ratio also resulted in a statistically significant association between the initial course registration method and first-year student retention (spring to fall),  $LR\chi^2(2) = 82.58, p = <.001$ . Results of these tests are presented in Table 18 below.

Table 18 Pearson’s Chi-square to Predict Retention to Fall Using Initial Registration Method

<b>Pearson’s Chi-square Tests</b>	<b>Value</b>	<b>df</b>	<b>Asymptotic Significance (2-sided)</b>
Pearson’s Chi-square	83.75 <sup>a</sup>	2	<.001
Likelihood Ratio	82.58	2	<.001

*Note. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 682.85.*

### Determining Specific Cohort Retention Data

Once the dataset determined that the registration method had a significant impact on the first-year student retention (spring to fall) rate, a cross-tabulation was run to identify the specific rate of retention per cohort and their respective registration methods. Cohort 1 represented the 2010 Baseline Comparison Group, which experienced independent self-selected registration. Cohort 1 had 842 students (43.9%) not retained spring to fall, and 1074 students (56.1%) retained. Cohort 2 represented the 2011 Comparison Group, which was the first year of personalized preregistration. Cohort 2 had 718 students (32.9%) not retained spring to fall, and 1463 (67.1%) retained. Cohort 3 represented the 2012 Comparison Group, which was the second year of personalized preregistration. Cohort 3 had 712 students (31.3%) not retained spring to fall, and 1566 (68.7%) retained. This data is highlighted in Table 19 below.

Table 19 Cross-tabulation to Illustrate Rate of Retention per Cohort

<b>Cohort</b>	<b>Not Retained</b>	<b>Retained</b>	<b>Total</b>
Cohort 1 Count	842	1074	1916
<b>Cohort 1 %</b>	<b>43.9%</b>	<b>56.1%</b>	<b>100.0%</b>
Cohort 2 Count	718	1463	2181
<b>Cohort 2 %</b>	<b>32.9%</b>	<b>67.1%</b>	<b>100.0%</b>
Cohort 3 Count	713	1565	2278
<b>Cohort 3 %</b>	<b>31.3%</b>	<b>68.7%</b>	<b>100.0%</b>
Total Count	2273	4102	6375
<b>Total %</b>	<b>35.6%</b>	<b>64.4%</b>	<b>100.0%</b>

#### Research Question 4

Was there a perceived impact of the preregistration process on administrative policy and procedure?

**H<sub>0</sub>4:** There was no perceived impact of the preregistration process on administrative policy and procedure.

**H<sub>a</sub>4:** There was a perceived impact of the preregistration process on administrative policy and procedure.

In order to examine Research Question 4, a program evaluation approach to narrative inquiry was completed, as well as consideration of feedback collected via interviews of indirect stakeholders in the AIQ process. That analysis is provided below.

## AIQ Program Evaluation

The data collected and analyzed for this dissertation considered the year prior to the AIQ preregistration process (2010) and the first two years of the AIQ preregistration process (2011 and 2012). This process has been used continuously since 2012, and the following narrative outlines the evolution and present-day (2017-18) AIQ experience.

In 2010, as has been previously discussed, the course registration process for first-semester freshman students took place during their orientation session. Students briefly met with academic advisors, primarily faculty, then registered themselves through the student information system for their upcoming fall courses during a designated period of approximately 45 minutes. It was not unusual for students to not finish this process during the allotted time, nor accomplish enrollment in major-related courses. If a student had prior course credit warranting an override for a prerequisite, they often required direct connection with the corresponding department head. There were no waitlists on courses at this time, but students often pursued an override for a closed class. The process could be very stressful and frustrating for students and parents during their first hands-on university experience.

In 2011, with the introduction of the AIQ process, the intent was to eliminate or greatly reduce the aforementioned stress and frustration. The Assistant Provost for Retention and Student Success worked with academic department heads to develop a first-semester plan for incoming students, and with the Admissions and Orientation offices to develop a questionnaire for students to complete. This questionnaire, the AIQ, prompted students to indicate their academic major of interest, general education courses they may prefer, and limitations to the schedule or additional information. The AIQ was independent of the orientation application/registration process, and many students completed one or the other, but not both.



Communication efforts were made by the Admissions and Orientation offices to reduce or eliminate any incomplete steps. Over an approximately three-week period, a small group of academic advisors from the Center for Advisement and Student Success (CASS) worked alongside the Assistant Registrar to design and develop personalized course schedules for every anticipated student through a special Microsoft Access database and Banner. The process was initiated with a math and English course registered for every student, then each student record was revisited to increase hours to full-time with assorted major or general education courses. This preregistration continued throughout the summer as new students were admitted and signed up for orientation. When students arrived at their designated orientation session, they were permitted to make changes to their schedule. In many instances, students opted to erase their predetermined schedule altogether, and to rebuild it personally. This was not the intent of the AIQ process, however.

In 2012, the program did not experience significant changes. More academic departments were aware of the need to prepare for the incoming students with necessary courses, but commitment from campus administrators and personnel was not readily existent. This second year of preregistration avoided the 2011 practice of two-step course registration, and all students were immediately scheduled for full-time hours (math and English, plus at least two other appropriate courses). In 2012, however, students were made aware of the special schedule they were given, and discouraged from making changes unless having consulted with their advisor. At the end of the day of their Orientation session, their access to registration was placed on hold. This prevented the student from adjusting their schedule until shortly before the start of the semester.

By 2013, the program and process were being accepted across academic departments as the primary method to prepare for incoming first-year students. An added consideration to the AIQ process was the “15 to Finish” promotion, through which students were encouraged to complete at least 15 credits per semester toward a four-year graduation plan. Additionally, course waitlisting had become commonplace for general education courses, which aided in the planning process for course availability and departmental needs. As many students chose to waitlist for closed courses, the limitation to make changes to schedules beyond the orientation session was eliminated.

#### Interviews With Indirect Stakeholders

The second approach used to consider the perceived impact of the AIQ was constructivist grounded theory in nature, due to its research of a process within a university, and how this process may impact various independent departments in the institution (Charmaz, 2006; Creswell, 2013). The five participants in this study had all experienced the process of course registration for first-year students, although indirectly. All participants were selected by theoretical sampling, based on their perspective as administrators within their academic and student service departments, and were interviewed by an associate of the researcher that is familiar with the course registration process (Creswell, 2013). During this interview, participants were asked the following questions:

1. What is your understanding of the Academic Interest Questionnaire process?
2. How have you seen the program evolve and/or impact the organizational structure?

3. What benefits have you experienced in your department/college since the program has been in place (2011)? Examples: Advisement, Communication between departments, retention, student preparedness
4. What challenges have you experienced in your department/college since the program has been in place (2011)? Examples: Advisement, Communication between departments, retention, student preparedness

The participants were also provided with an overview of retention data and other results from the quantitative analysis in this paper, and were asked to comment on this data. The interviews were recorded and provided to the researcher for review, coding, and further analysis (Creswell, 2013). As coding was conducted, three main themes emerged: Student Success, Administrative, and Perception. For the Student Success theme, codes were associated with the following terms: retention, grades, grading, stay, improve, recruiting, placement, and enrollment. The Administrative theme referenced process, policy, procedure, and change. The Perception theme highlighted comments referencing feelings, thoughts, and opinions. Below are several quotes indicating the perceived value and impact of the AIQ process, according to those interviewed.

#### Student Success:

1. “Preparedness has probably helped our actual enrollment number because we did not have students leave here that were frustrated because they didn’t have enough classes”
2. “That question helped us identify their students and place them correctly”
3. “It gives us a better read on what our freshman class looks like”
4. “Helped us tremendously”
5. “It’s actually a recruiting tool that we use on freshmen”

6. "I understand that it's kind of a retention tool"

Administrative:

1. "Smarter way to do business"
2. "Sometimes it's difficult to engage the student to fill it out properly"
3. "You can address the shortage of classes"
4. "Larger institutional focus on the metrics that drive our funding"
5. "We're changing one class here instead of building entire schedules"
6. "When the student comes here he or she can concentrate on other things"

Perception:

1. "There's not that sense of panic among the freshmen anymore"
2. "You know I think it's just a less stressful situation"
3. "That may become one of the best tools we have to use toward progression rotation and rationing and ultimate graduation"
4. "It's a little bit intimidating"
5. "When this idea got brought up it seemed like a lot of work"
6. "I think everybody on campus understands how it works now"

The individuals interviewed for this qualitative exercise were forthcoming with constructive criticism and suggestions for further discussion and application for the preregistration process. The participants indicated initial concerns of the effort necessary to implement the preregistration process, as well as the institutional focus on student success and retention to bolster funding allocation. Ultimately, the feedback from each division interviewed will be shared with staff and administration to consider improvements to the preregistration process.

## CHAPTER V

### DISCUSSION AND CONCLUSIONS

It is important for American universities and colleges to consider the financial implications associated with a strong level of academic success and retention at their institutions. Many states, Tennessee included, are state-funded through an outcomes- and performance-based formula (Fain, 2013; Tennessee Higher Education Commission, 2010, 2011a). To avoid the financial repercussions of lower student retention and academic success, many initiatives have been developed related to orientation programs and specialized academic advising. These types of programs, while certainly academic, also include administrative and procedural consideration, which could impact a student's persistence at an institution (Dolence, 1991; Seidman, 2005). One administrative process to consider is the method or style of course registration, as examined in the current study, and if this registration method combined with assorted student characteristics leads to an increased rate of student academic success or retention. To date, very little research has been conducted on course registration behavior of students, and any evaluations that have been completed were confined to late registrants (Angelo, 1990; Diekhoff, 1992; Mannan & Preusz, 1976; Peterson, 1986).

This study examined three cohorts of first-year students through their initial course-registration process and freshman orientation, and then followed their progress through the first academic year. Each of the cohorts had a different method of first-time registration. Members of the first cohort (Baseline 2010 Comparison Group) self-selected and registered for courses

during their orientation session. Members of the second and third cohorts (2011 and 2012 Comparison Groups) were assigned a course schedule based on their successful completion of an Academic Interest Questionnaire (AIQ) prior to orientation. The preregistration process was slightly different for the 2012 Comparison Group than its predecessor, 2011 Comparison Group: the staff involved in the process had prior-year experience, additional restricted course sections were provided, course registration for the general student population was closed, and freshman students included in the preregistration process were limited in their abilities to alter their course schedule following their orientation session. The three groups were analyzed to determine if the initial method of registration was related to their rate of academic success and retention.

#### Research Question 1

The first Research Question asked what combination of student characteristics best predicted first-year student success at UTC based on six academic outcome variables. The outcome variables were semester GPA, semester attempted credit hours, semester earned credit hours, overall GPA, overall attempted credit hours, and overall earned credit hours. The student characteristics considered were residency, gender, ACT/SAT score composite, English readiness, math readiness, Pell Grant eligibility, program, college, SAP status, dual enrollment status, and AP placement.

#### Semester GPA

In each of the three regressions, gender was a significant predictor, and females were found to have higher semester GPAs. ACT/SAT composite readiness was significant across all three years, and those who were ready had semester GPAs slightly higher than those who were

not. Pell Grant eligibility was found to be a significant predictor in each of the three regressions, where participants who were eligible tended to have lower semester GPA scores. Dual enrollment was also significant in each of the three regressions, as was having earned AP credits. When considered as a whole, the ACT/SAT readiness, Pell grant ineligibility, dual enrollment, and AP credits earned indicate that those students within a higher income bracket are generally more academically successful due to the often expensive college preparation opportunities.

#### Semester Attempted Credit Hours

In each of the three regressions, gender was a significant predictor, and females were found to have attempted more credits in a term. ACT and SAT composite readiness was also a significant predictor each year, where those who were academically ready tended to attempt more term credits. In the case of engineering students, for example, ACT/SAT readiness may permit a student to take a full schedule of major-related courses rather than only limited general education classes. This group of majors, in particular, requires fewer general education courses overall, so attempting additional credits early on may contribute to a less-than-full-time schedule in future semesters. Dual enrollment status and AP status were significant predictors for each year; however, the beta values fluctuated between positive and negative coefficients.

#### Semester Earned Credit Hours

In each of the three regressions, those from east Tennessee earned significantly less credits than other residencies. As east Tennessee students may be living off-campus, commuting from home, and/or working more hours at a part-time or full-time job, they may be more inclined to split their hours between UTC and a local community college. Gender was a significant

predictor for each regression, and females were found to have earned more credits in a term. ACT and SAT composite readiness was also significantly predictive each year, as well as math readiness. In the case of math readiness, students are more likely to be on their academic curriculum path, so their motivation to complete more hours is increased. Pell Grant eligibility was also significantly predictive of earned credits, where eligible students tended to earn more credits than those who were not recipients. As these students are more dependent on financial aid and may not be working off-campus, their commitment to complete courses more quickly may be stronger. Dual enrollment status was a significant predictor for each year, where students who were dually enrolled tended to earn more credits. Finally, AP status was also significantly predictive of the earned number of credits for each examined year. Overall, completion of dual enrollment and AP has implied stronger academic readiness for major-related courses, much like the ACT/SAT readiness previously discussed.

#### Overall GPA

In each of the three regressions, gender was a significant predictor for each regression, and females were found to have higher GPAs. ACT and SAT composite readiness was also significantly predictive each year with regard to higher Overall GPAs, as was math readiness. Pell Grant eligibility was significant, where eligible students tended to earn higher GPAs. Placement in the engineering program was also significantly linked with GPAs, where engineering students tended to have GPAs between 0.05 and 0.11 points lower than other students. This outcome may be due to the expectation of significant Physics and Calculus coursework during the first year, while students are still struggling to transition to life in college. Completion of dual enrollment and AP credits were also significant predictors for each year as



well, with higher Overall GPAs in both instances. This last statement, related to AP and dual enrollment, further illustrates the fact that more prepared students -financially and academically - are generally more successful.

#### Overall Attempted Credit Hours

In each of the three regressions, gender was a significant predictor, and females were found to have attempted more credits overall. ACT and SAT composite readiness was also significantly predictive each year, where those who were ready tended to attempt more overall credits. Pell Grant eligibility was also significantly predictive of overall attempted credit hours, where eligible students tended to attempt more credits than those who were not. Dual enrollment status was a significant predictor for each year, where students who were dual-enrolled tended to attempt more overall credits. Finally, AP status was also significantly predictive of the attempted number of overall credits throughout time, where AP students attempted more credits than non-AP students.

#### Overall Earned Credit Hours

In each of the three regressions, gender was a significant predictor, and females were found to have earned more credits overall. ACT and SAT composite readiness was also significantly predictive each year, where those who were ready generally earned more overall credits. Math readiness was another statistically significant predictor, and students who were math ready tended to earn more credits than those who were not. Pell Grant eligibility was also significantly predictive of overall earned credit hours, where eligible students earned more credits than those who were not. Dual enrollment status and AP credits were both significant

predictors for each year, where students who were dual-enrolled or completed AP tended to earn more overall credits.

## Research Question 2

The second research question of the study asked what combination of the six academic outcome variables best predicted first-year student retention at UTC. The outcome variables were semester GPA, semester attempted credit hours, semester earned credit hours, overall GPA, overall attempted credit hours, and overall earned credit hours.

### Retention From Fall to Spring

Results of the first step of this binary logistic regression indicated that each of the six predictor variables (semester GPA, semester attempted credit hours, semester earned credit hours, overall GPA, overall attempted credit hours, and overall earned credit hours) contributed useful and unique predictive information. In the final model, approximately 98.20% of participants were correctly predicted to be retained versus non-retained. The registration method was significant in that students processed through the preregistration process were more likely to be retained by a factor of 1.91. The term UTC GPA, number of term credits attempted, and the number of overall credits earned were negatively correlated with retention, meaning that an increase of any factor independently corresponded with a lower likelihood of retention to spring. The data is unclear why these listed variables independently led students to leave during or following the first semester, but it is interesting to highlight the positive impact of the preregistration process.

## Retention From Spring to Fall

Results of the first binary logistic regression indicated significance in step one, although overall GPA was considered ineffective to predict retention to the fall semester, and was removed from the model. The final model included semester GPA, semester attempted credit hours, semester earned credit hours, overall attempted credit hours, and overall earned credit hours. Ultimately, approximately 94% of participants were correctly predicted to be retained versus non-retained. For each point increase in UTC GPA, students increase their likelihood of retention to spring by a factor of 1.63, while an increase by one in the number of attempted credits overall was found to correspond with an increased likelihood of retention by a factor of 1.14. The registration method was significant in that students processed through the preregistration process were more likely to be retained by a factor of 6.00, indicating that these students were six times more likely to be retained. Both the number of term credits attempted and the number of overall credits earned were negatively correlated with retention. In other words, either could independently increase and correspond with a lower chance of spring to fall retention. The most valuable piece of data found through this particular study is the significant increased rate of retention from students who experienced the specialized preregistration process.

### Research Question 3

The third research question asked if the initial course registration method used was a predictor of first-year student retention at UTC. A significant relationship was found between the initial course registration method and first-year student retention (spring to fall). Further evaluation was completed through a cross-tabulation to identify the specific rate of retention per cohort and their respective registration methods. The 2010 Baseline Comparison Group, which

experienced independent self-selected registration had 43.9% of the population not retained spring to fall, and 56.1% retained. The 2011 Comparison Group, which was the first year of personalized preregistration had 32.9% not retained spring to fall, and 67.1% retained. The 2012 Comparison Group, which was the second year of personalized preregistration had 31.3% not retained spring to fall, and 68.7% retained. Above and beyond, it is indicated here that the preregistration method has an significantly positive impact on the retention of first-year students.

#### Research Question 4

The fourth and final research question asked if there was a perceived impact of the AIQ process on administrative processes. The program evaluation via narrative inquiry identified ongoing changes to the process, and highlighted ways that communication, collaboration, and cooperation among academic departments have improved. With full implementation of the AIQ in 2013, the program and process were being accepted across academic departments as the primary method to prepare for incoming first-year students. The preparation for each upcoming year began almost immediately after the end of the summer term. An added consideration to the AIQ process was the “15 to Finish” promotion, through which students were encouraged to complete at least 15 credits per semester toward a four-year graduation plan. The Provost demonstrated support of this program by urging academic deans and department heads to offer enough sections of courses that freshmen needed their first semester. As the preregistration process kicked off in May preceding the summer orientation period, the Assistant Provost of Student Success and Retention was in constant communication with academic department heads to ensure availability of courses as they filled. Additionally, course waitlisting had become commonplace for general education courses, which aided in the planning process for course

availability and departmental needs. As many students chose to waitlist for closed courses, the limitation to make changes to schedules beyond the orientation session was eliminated.

In 2014, the preregistration program shifted in many ways. First, the separation of the orientation application and the AIQ was dissolved, and students seamlessly completed a single online form to meet both requirements. While this change eliminated the option for a truly personalized, major-specific review by the student, it did allow for reduced steps for the student. Next, the preregistration program transitioned from the Access database to the Argos reporting system. This change permitted real-time viewing of the course availability alongside the course selection process for the AIQ registration. With this wider scope of access, additional professional advisors from the College of Business; College of Health, Education, and Professional Studies; and College of Engineering and Computer Science were brought in to assist the Center for Advisement staff with preregistration. At this point, the previous three- to four-week experience was reduced to no more than a five-day activity, and the process had garnered full buy-in from the majority of the institution's academic departments.

The AIQ and preregistration process for first-year students did not change considerably after 2014, as it appeared to be working well and serving students, advisors, and academic departments well. Effective 2016, the process was expanded to include entering fall-semester transfer students. For this population, the primary responsibility for preregistration was shouldered by the appropriate academic departments, rather than the Center for Advisement, so that necessary prerequisite and closed class overrides could be applied.

The other approach used to consider the perceived impact of the AIQ was constructivist grounded theory in nature, due to its research of a process within a university, and how this process may impact various independent departments in the institution (Charmaz, 2006;

Creswell, 2013). The five participants in this study had all experienced the process of course registration for first-year students, although indirectly. The individuals interviewed for this qualitative exercise were forthcoming with constructive criticism and suggestions for further discussion and application for the preregistration process. The participants indicated initial concerns of the effort necessary to implement the preregistration process, as well as the institutional focus on student success and retention to bolster funding allocation. Ultimately, the feedback from each division interviewed will be shared with staff and administration to consider improvements to the preregistration process.

### Conclusions and Implications

This study was based on a model by Bean and Metzner (1985) which analyzed variables impacting nontraditional student attrition. While Bean and Metzner evaluated six background and defining variables, four environmental variables, three social integration variables, and six academic variables, the present study evaluated five background variables, one environmental variable, four academic variables, and two registration variables. A large number of significant relationships were determined within the revised conceptual framework for the academic success and retention of first-year college students.

With regard to the value of student characteristics in academic success, female students were most likely to be academically successful. Other frequently significant predictors were ACT/SAT composites scores, earned dual enrollment and AP credits, and general Math readiness. None of these characteristics were surprising as predictors of success, and each were fully supported as important variables in the literature review. Less common predictors of

academic success were English readiness, Pell Grant eligibility, Satisfactory Academic Progress status, residency, and major program.

For retention both fall to spring and spring to fall, at least 94% of students were accurately predicted to be retained versus non-retained. The variables with a positive impact included increased semester and overall earned credit hours, the completion of the preregistration process as their method of first-time course registration, and a higher overall GPA or UTC GPA. The remaining academic outcome variables were negatively correlated with retention, which may be an interesting follow-up study. Finally, when the first-time course registration method was isolated for consideration and analysis, those that completed the preregistration process were more likely to be retained at UTC.

The fourth research question was a consideration of the perceived impact of the AIQ on administrative processes. Through the narrative inquiry, it was found to have been streamlined and expanded over time, and that the majority of academic departments have become vested in the process. The narrative findings were supported by the interview responses. In particular, the indirect stakeholders shared their initial concerns about the implementation of the AIQ years ago, and their understanding of the practice at present. Additionally, those interviewed commented on the generally positive outcomes their departments have experienced, such as better mathematics course placement, improved recruitment strategies, a decrease in the stress on students and families, and the viewpoint that the program is overall a benefit to the students and institution.

#### Changes in Policy and Practice

As noted throughout this paper, the academic success and retention of first-year students typically results from a combination of multiple factors. Students with higher income, indicated

by their lacking eligibility for federal Pell grants, are more likely to earn AP and dual enrollment credits. These same students have increased earned credit hours and higher semester and overall GPAs. But the focal point for this research study was the registration method used initially as an entering first-year freshman, and this single detail proved to be a significant and positively impactful variable.

Over the three-year timeframe studied, the process for course registration was different with each new year. In 2010, the process was the same as it had been for many years prior – students registered for classes independently during their orientation session. Starting in 2011, this process was significantly changed so that students completed a preorientation Academic Interest Questionnaire (AIQ) and advisors carefully selected specialized courses for the individual student. The process evolved slightly in 2012 based on experience from the previous year, as the retention levels continued to improve. Since the time period of this study, the preregistration AIQ process has continued to develop and advance, and retention has steadily improved each year. Additionally, with regard to high school GPA and ACT scores being valuable indicators of long-term student success, UTC has increased admission standards to a current minimum entrance requirement of a 2.85 high school GPA and an 18 ACT composite score (University of Tennessee at Chattanooga, 2014). An alternative combination for admission is a minimum 2.5 high school GPA and a 21 ACT composite score.

As a previous administrator for the AIQ process and a current academic advisor designing schedules, the researcher does recognize that much of the benefit from the AIQ and preregistration process stems from the collaboration and communication among campus departments. Prior to the consideration and development of this program, academic departments and student service offices operated in siloed environments. However, over time, expansions and



improvements took place across campus in the areas of professional academic advisement (particularly with the creation of an Advisors' Council), the Office of Enrollment Services, and relationships with academic departments in general. Student service and academic success has developed into the primary goal for the campus as a whole, rather than the needs of individual departments and divisions. With the formal data now available to support the AIQ process, the program has been tailored to service new transfer students through their orientation process as well. A pared-down AIQ has been designed to coincide with the different needs of this special population, and more changes are anticipated in the near future. As resources and collected data continue to be evaluated periodically, the process may eventually be expanded to the second semester freshman registration and beyond.

#### Recommendations for Further Research

This study researched the connection of specific student characteristics, course registration methods, and academic success outcomes for first-year, first-time freshman students.

Future research should be completed to assess the following:

1. Student-specific qualitative data. The strictly quantitative data used to consider student success in this study did not consider the personal reasons that students may not be academically successful or maintain enrollment (retention).
2. Research on registration methods with regard to academic success and student retention at four-year institutions is very limited. Those that have been completed have concentrated on the late registration or enrollment behaviors of students and not on the efforts of a personalized course registration process. Based on information gleaned from recent advising conferences and policy manuals, it appears these

preregistration programs are becoming more prevalent, but the literature has not been extensively developed to date.

3. This study only analyzed the years 2010-2012, with two years of preregistration and academic success outcome data for first-year students. This program has continued to expand and evolve, and additional changes to academic success programs and enrollment management have developed. Follow-up research of these student academic outcomes is warranted to determine significance.
4. The preregistration process has recently been expanded for entering transfer students. Using the same or similar academic outcome success markers, the impact of this process should be assessed for this new group of students.

As illustrated by the literature review and results of the research within this paper, there is no single solution to the challenge of college student retention and academic success. However, development of appropriate programs to streamline administrative processes for students is certainly a sustainable and valuable factor in the pursuit of a “desirable student outcome” (Cuseo, 2007, p. 2). This contribution to the limited research on enrollment and course registration behavior of college students is intended to encourage further improvements of administrative processes in higher education in a concentrated effort to bolster student retention and academic success.

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APPENDIX A

VARIABLES ANALYSIS



VARIABLES ANALYSIS

	<b>Variable Label</b>	<b>Levels of the Variable</b>	<b>Scale of Measurement</b>
<b>Dependent Variable(s)</b>	Semester GPA	0-4.00	Interval or Ratio
	Cumulative GPA	0-4.00	Interval or Ratio
	Semester Attempted Hours	0-20	Interval
	Semester Earned Hours	0-20	Interval
	Cumulative Attempted Hours	0-100	Interval
	Cumulative Earned Hours	0-100	Interval
	Academic Standing	1 = Good 2 = Probation 3 = Suspension 4 = Dismissal	Nominal
	Retention from Fall to Spring	1 = Retained 2 = Not Retained	Nominal
	Retention from Spring to Fall	1 = Retained 2 = Not Retained	Nominal
<b>Independent Variables</b>	The Style of First-time Registration	1 = Independent Self-Selected 2 = Personalized Preregistration	Nominal
	Comparison Groupings	1 = Baseline Manual Comparison Group 2 = AIQ Comparison Group A (less than 50% changes) 3 = AIQ Comparison Group B (50% or more changes)	Nominal
<b>Extraneous Variables</b>	Permanent Residency (county)	1 = West Tennessee 2 = Middle Tennessee	Nominal

		3 = East Tennessee 4 = Out of state	
	Gender	0 = Male 1 = Female	Nominal
	Academic College	1 = Arts and Sciences 2 = College of Business, CHEPS, CECS	Nominal
	Academic Program	0 = Undeclared 1 = Arts and Sciences 2 = Engineering and Computer Science 3 = Health, Education, and Professional Studies 4 = Business	Nominal
	ACT/SAT Composite	0 = 21 & below (990 & below) 1 = 22-25 (991-1179) 2 = 26-28 (1180-1299) 3 = 29 & above (1300 & above)	Nominal
	English Ready (ACT sub-score)	0 = Yes 1 = No	Nominal
	Math Ready (ACT sub-score)	0 = Yes 1 = No	Nominal
	Dual Enrollment/AP credit	0 = Yes 1 = No	Nominal
	Pell Grant eligibility	0 = Yes 1 = No	Nominal
	Financial Aid Satisfactory Academic Progress (SAP)	1 = Yes 2 = No	Nominal

APPENDIX B

QUALITATIVE INTERVIEW TRANSCRIPTS

## QUALITATIVE INTERVIEW TRANSCRIPTS

### INTERVIEW A

So what is your understanding of the academic interests questionnaire process. The process. So my understanding is that. Some magic fairies up the hill create the academic interest questionnaire based on the major that the student selects. They get a different questionnaire. The student when they're going through the orientation process part in order to finish each process they must fill out a questionnaire. And it's a good way for us to gauge a first schedule for the student to which they can make changes when they attend to where it. Can be seen the program. Over. The course of. Its use. Yes, so it's evolved. I would say quite a bit. It used to be pretty cumbersome and hard to manage and figure out what went where. Now you know everything is in Argos which makes it a. Much better system. You know there's still some things that you know it's not quite as robust. I feel like it could be perhaps but. You know I think that it's. You know it's the best rather short of sitting down with each individual soon as we used to do. I think it's the best way to do it. Yeah. What are some things you think are maybe lacking. I think that sometimes it's difficult to engage the student to fill it out properly and they're their ability not just click through it and hit submit. I had a lot of students to do that and they don't. You know pay attention to the nuance. We also miss a lot of students who are taking dual enrollment or AP credit or. You know different things like that because our parents. Have a goal that so for the first time they're faced with filling something out. They're not really sure what to do. Or their parents filled it out and forgot that they took. AP classes hard enough who's actually filling it out. So I'm

not sure you know and then you have students. I think it is a good. Good tool but I do think that we get to the point like right now where I have students that only have two classes because that's all that is available. So. We have to also figure out the back end of that is how can we quickly. Add more classes to make sure it has. Courses to take. Especially those transfer student. Sorry. It is very hard. So what. Benefits have you experienced in your department since the program's been in place since 2011. Nice. Okay. Yeah. You know it has helped us tremendously it's actually a recruiting tool that we use on freshmen when they come in for an official visit. We talked at length about the fact that. You have preregistered which means you know if we get out of class we add more classes. You know you will never have that. My first class is at 8. My last class is in a. Type of a situation. So we use it heavily in recruiting. Also I do think that it gives the advisors a better understanding when they come to orientation. We're changing one class here they are instead of building entire schedules. So I think for use of their time while they're here it's much much better. There's not that sense of panic among the freshmen anymore. If I don't use that first three station I'm screwed I'll never get a good class schedule. I think it has. Given us more freedom in the summer to attend to other things beyond just orientation all summer long hoping to get classes. Right. Good. On the other side of that. Any challenges you've experience since the firm's been in place. You know it's evolved. You know at the beginning there were a lot of challenges with information that couldn't see students for days on end after they filled out. And now it's much faster. You know there's still an issue if a student is you know requesting a fee deferral or something like that. Make sure they're actually still counts and goes through if they're spending all those types of things. You know. Right now I have freshmen that only have six hours. Because they just add their HQ this week and we're hoping to get into the teens and then get classes at it but we don't know. We don't know when that happens and then go in and.

Add more classes to their schedule. So I think that that's that's definitely a challenge. But all in all I think it's still I don't know a better way to do it. Yeah. So some retention data so I'll run through that with you and then just any thoughts you have on it. So this is just for sure attention data in 2010 which was the year before I started. First your attention was at 56.1. In 2011 it jumped to 67.1. 2012 was at 68.7 and then 2015 which is the most recent data we have it was at 74. That's amazing. So any thoughts on that in relation to IQ. I do. I think when your first. Introduction to the university. Is orientation typically. Right. And so I think the fact that you come in it's not this pressure situation to build classes. I think it's more about. You know here is what college is going to be like here's all the great things we offer instead of this stressful. Parents waiting outside the door hoping their kids about the classes. You know I think it's just such a less stressful situation. And now when they come to orientation they can focus on very happy fun and that's part of what my intention is about just making sure they connect to the campus itself. And so I think that that has played a role in it. You know they've done a lot of other programs as well. We can't. Account for how it affects the data. But I would be hard pressed not to think that ARPU plays a big role in that. That the students feel comfortable with their schedules and knowing about their schedules and. Prizes to their schedules. And you know they're able to you know by their books a lot over the summer and haven't really enough for that type A students. They know that they got it and they got the classes they need they can. Relax. So I. I mean I think that it has to. That's all her questions. Any other general thoughts comment. No. Like I said I mean I think it's running well. I think everybody on campus understands how it works now. The faculty of body which is a big piece. Now if we can just figure out that magic formula how many classes. If only if only. Yes it is it is thank you yeah.

## INTERVIEW B

Asked So what is your understanding of the academic interest questioning the process. My understanding is it is tied to our orientation reservation system so students will select a date and then actually to complete the orientation process they enter the survey so their advisors can self you know not advise but register them prior to a tee indeed and match classes for them so that it's not the only thing that we do at orientation so it's part of the reservation process. It needs to be quickly completed before we can actually reserve a space for the summer. So how have you recognized the program involving end or impacting the organizational structure. It started I guess from admissions prospective to different things. Shortage of classes. Ian Hasteley advisement with freshmen new not understand there was a lot of explanation that needed to happen in a very small amount of time in orientation it was too stressful. So when this idea got brought up it seemed like a lot of work up for it but it seemed like Yep it works like we thought it was going to win then could kind of take some of the stress off and people did not have to worry about not having a full time schedule and take some of that out of that orientation prices that people would probably pay more attention to what was being said to them they could have just as scared or better and be in a better place and be happier about it. Ian just take the stress out of that part. So um so on that endeavor it seemed great. The only thing that involved at first I don't think it was actually required the way it was Bill. They a sign of orientation and then we had to kind of chase them to go back and do that. HQ but as it evolved and we were able to merge it together and it became part of a process that was worse individuals that we had to do before they got here. One thing I think that we did realize as it went along it's a little bit intimidating. It's probably the first time that some of these students right. Oh it's like I'm really picking this as my school you know. So we've forced their hand a little bit earlier. There may be some schools to do that but that

means they're really serious people you know or students and you do see is really considering nerds if they're going to answer all those questions and complete their process. It gives us a better read on what our freshman class looks like. So you know if you're a committed like Dad you're going to answer about classes and picking out things that means you're pretty vested in you being an option for you. So we did know Kerry and I talked about it. We did offer some phone calls and emails to students who it looked like they started the process and didn't finish it because maybe they didn't know that they were confused engineered and things like that. So we all learned how to do that better and then I'm pretty sure they did also or if not they were going to do a video that kinda took the stress out of it like know they can change you know you're okay. And that helped with kind of the people maybe hesitating at first to go ahead and reserve a spot. So all in all I think the benefits much outweigh maybe some people's hesitancy to do it first and then we went back and addressed how do we make this more user friendly so it's not so intimidating to somebody so you know I think it's pretty positive. I mean it seems like it works. Seven years yeah it sounds like a crazy idea you know. But now it's like a year ago now because you can address the shortages of classes in it's real people not guesses. What we think we need this many more Ingle's. No. You know you need this many more English slots or you know this when one mass flight it just seems like a smarter way to do business. You know and when I used to I used to run orientation there were orientation and sign at that table. The only thing students want to talk about are how many spaces are left in this class like that was the only conversation that was happening in you know the minute that you printed the list of the open sections. Once people start to register and you couldn't promise that that eight o'clock class was there. And that's really it drove the whole process. Now they're not driving the whole process. So I think that's a very positive thing for that in result of the students that enroll here. So mean it so this probably I



think you kind of beans with the question already but what benefits have you experienced in your department or college since the program has been in place. Examples are advisements communication between departments. Retention students prepare prepare less represents ACUs admissions office has been fitted in preparedness probably has helped our actual enrollment number because we did not have students leave here that were frustrated because they didn't have enough classes. They didn't know how to make it work. In the old days when we had to do close classes or do wait lists or you know just wait and see the drop that was not a good play and for people who were not yet here invested in a sin. So I think it made the parents feel more confident about our bodies and our about the way that we would handle their student and things like that. It just it benefited. I think we've been affected that way that the people that were coming in and saying they were interested we did not lose people because they didn't have classes to take. You know that's that's a hard loss when you've got em all the way through the system and they've hit all the bits marks into here and not have classes and walk away frustrated that's bad PR and you know that word of mouth really hurt. As far as the images of it it just has to be frustrating you know and so you get that phone call that escalated to the narks degree because I paid my money I applied you know six months ago and then I show up in I can't get classes so I think it's been a bit at the bottom one for sure. People that could be here and be happy about the classes that they have. So what challenges head specifically experienced that Valerius been in place. I don't really know since that had Chens as I said the one challenge that we helped with was maybe people's hesitancy to go ahead and complete it because they didn't quite understand it. So we helped with the phone calls and you know some of the course and it's that way but not specific challenges out things with our office. So do you have any questions for me about how things go. I mean I know we can try to keep communication very pretty there. Yeah. I've not seen you guys in the war

room was what we called it in a while. You know I kind of saw that process at first and you know it's it's a cool kind of way that your restroom that many people have that managed. You know when you look at the numbers and say oh no I think I understand you know the concept and that you've actually pulled in other departments to come to preregister their students and then you know I know that you know athletics comes over in some other departments and then the the only other group that's kind of there but not there sometimes that international students that still can add that yeah that's a grey area. Well we have we kind of bring them in around the area and a certain you know scenario of being fully admitted in that stage then we have preregister dim but in 95 percent of those students have been dropped for not paying tax because of it. The only other Stroebel is for the kids that don't go through the process with the freshmen process because before because it was just like this process it was a shoot process. After orientation was over the people that we tried until school starts it kind of was the same process but it was fast tracked. That part's all all harder to can explain because it's so simple now we can just get him through that orientation then we don't have to worry with this running people around it and you Gar's office helps that tremendously too because at least they have a starting point if they need an advisor. So as you figure every year offers continue to grow. That became a better central place to triology the students that didn't make it to that orientation session. But but yeah it probably spoors them on the ball that Afeni actually her a high rate you know in a good way but that said it's a mess. There are other things in life worth Ged's or you know I just want to tweak it a little. My own so but I mean that's a good thing too but actually that's a good thing.

## INTERVIEW C

So what is your understanding of the academic interest questionnaire process. Oh my understanding is that a student cannot solve it for information until it filled out the Q which is

part of that process of scheduling orientation and orientation or that orientation reservation. I don't personally know how to access the human genome but you're missing that we use numbers. Yeah. OK. So we actually pull them and we build schedules for all of the students and they registered they're kind of put in line to register before the students as freshmen so they get plugged into the system first. So we use the excuse to determine you know how we're going to flesh out their schedules because they have to take certain courses and honors. But obviously we're looking at the majors and other things. So Debbie battle who is our Associate Director is the one who has pulled those sort of sifted through the most closely. So they're really important for us to use that in terms of you know the process of them on the canvas. They reside somewhere mystical. And as I said My understanding is that students cannot sign up for. Orientation that. All right. That is just a suggestion. That's the other side. Yes that's very different. I mean we were and I understand the purpose behind trying to build schools for all freshmen before they arrive and the significance of that and I think that's a powerful thing to do when the students come with forestation the first day we meet them separately in the session where they do other stuff on campus. They do a regular iteration of them. So we had a session before that and explained sort of what sort of honors again. And the second day for vising we are available and revising all day. We get quite a bit of traffic. The students are moving things around and rightly so. We know it's it's we tell them don't worry and they don't seem to be too worried about it. I think it freaked me out. One of the things bright getting a schedule Yes but that was that I did not control Yes breaths of control issues. How you see the program involved or impact campus. I don't know. I think it'd be very I mean I understand that it's a kind of a retention tool or maybe I don't know what you call it you know what you're onboarding students but it's something that subverts their attendance their role in I guess I got that. I've never seen any

data to show that it actually is effective. So that would be useful to see that it really doesn't prove the enrollment of students or move moving students from interest in application acceptance to actually classes. Right. And I think that's what it's for. It might be that it's for retention in some way. Of course we're conscious that there's a move to make sure all students are taking 15 hours which it has its own challenges but those are of interest to students and that's a big nightmare right now. Yeah. Yeah. So I don't really know how it hard to be. I will say when I started our new Well you know I actually did months work. Blake Pierce was here at the time and he helped me. He pulled they are cues and help me determine what classes make the most sense for us to isolate to require students to take based on what they were in in or any credit card check is a really good one here a common class for them. Yet most of them have taken it because it's a big problem with us an honor since so much of what we require of students and the courses that they take or in general education. Since many of them are coming to us with 30 hours of gender it's difficult because then you end up taking courses that sort of double count rises. And this is going to be a bigger and bigger problem. So the queues when I first put that group together we knew that we wanted them to live together as a true living community they lived together campus in the residence hall. They took comfort and us to you 12:54 us that our time and your experience for us and that which now will be off desert you have 1200 for us but we were just getting started then. And then we offered an English history course which our faculty to teach. So six hours that that common seven hours coming in to keep us together is what gives the community that living together and having people kind of manage the show. You know so you know here was really important. You just went through your wedding. So this is what it looks like they haven't taken yet credit they still leave. So we kind of guessed as best we could to stop students from hesitating and to take care of it. Right. Yeah. So we've talked about this a little bit. But any other benefits

you've experienced in your department since the program started. Again I don't have longevity. I mean this is my fourth year. So that's how I believe it started. 2011 was the first year they started years before I got here. I mean they're instrumental for us and building schedules. Yeah you know that's the main thing that's really happening. If we have a requirement to build schedules which I don't know I imagine that they came about the same time. Yeah I think so. They started building schedules with you if you don't do that I guess yeah I mean they're they're really important to us since we have our meals on them in the summer. And we did all of the incoming freshman honors students which is about 90 students schedules all of those this year. Yeah. No great great summer but yes we do. So yeah I am. Any challenges you've experienced in your apartment program. Well I mean again because I know that when you get into doing it I don't know what you would say about that. Like what dissatisfactions or happinesses might be there. Yeah I don't know where they live. Are we in or something. They are in Argo's like so you know the late Mr. Big time to me and I've never gotten into it. Yeah. So I think accessibility might be just an issue for me not knowing anything I probably just pull one up right. And just because you have to have somebody over and again Argives is not something you are going to be in very often. So when it works I won't remember it because I don't do it every day. So over time you would have to I'd have to say something over and over again and get into it. So that's from that if there's a frustration and that's not even my frustration because like I said he does do that and she is into it so it's fine. But she would be asked about that. She's actually an indication this week. So yeah. OK well here is some general retention time. So I'll just read it something that. Give me your thoughts on it. We're just reaching the six year graduation date timelines. We don't have graduation data. This is first year retention. OK so 2010 which was the year before he started our attention our first year students was fifty six point one foot from the spring semester. That's

usually what that means. So and then in 2011 it jumped to sixty seven point one so that was the first year. ECU's 2000 and 12 it was at sixty eight point seven. And then in 2015 which is the most recent data we have was that 74 percent of course the difficulties that result the Iraqi get there's such a concentrated effort being made at a range of ways to keep pressure here. Well that's. The other just talked about. You know I wish there were gosh you know. Well our information systems are so all over the place that it's very frustrating to have so many different databases and we keep adding them instead of like maxing out the ones we currently have. Right. But our goal is really all the students mentioned resonance lifestyle. Yes. There's a lot of stuff that you know like you only have access to so much. Yeah. So I have nothing else that was great. No thank you. Yes your question last question. OK. If you really want to know about.

#### INTERVIEW D

And we come up with. So what's your understanding of the academic interest questionnaire process. So I understand it as a. Way to gather some student information from the students themselves self answered. I believe that we then use either as department heads or as advisers to place them into their courses as they are UTC. That's my understanding of what it is and how you see the process or the program involved or impact the organizational structure. Social structure. That's an interesting question. I'm not sure that I've seen a direct change in the organization here at YOU SEE THAT is the way we are built the way we are where staff and the way the reporting line tour. I don't know that I've seen a change because of that. Can you see any evolution in that academic interest process in general. Yeah. Well you know I mean I can just add a small part of what what we did which in mathematics was we we needed information on placement in one of the questions that we added at the time was whether students. And I think

there may be a question in there about what they're what their math Plint what they think their math placement might be or something like that. And we added to that or added to whatever already existed something about whether they had what we call sales or bridge math so that we could we could identify students who had taken a course that is offered through the TBR system in the senior year of high school for some students which had been used for putting students into a college level class. As it turns out that process has evolved whereas in the past two years we probably would have taken those students and placed them into college algebra more Krukow one. And that question helped us identify their students and place them correctly. We've now looked at how those students have performed because we know we've placed them in those classes for that reason and we then saw that perhaps we needed to back off and send them through another course in front of that. And in fact for example Channon in your state is doing something similar. They are putting their own sales students into a class before college algebra. So we're following what they're doing they're doing what we are doing. And but the acute process was the right way for us to find out about that because what had happened before was it students would just show up randomly in the math department call the math department or call some random person and just say it might be a parent or it might be the student themselves and say my child or I have taken sales math or they would they might just call it bridge math and we would have to then try to capture those people as they came back to process was I think better at finding those things. I don't know that we added anything else specifically and I should say that I haven't worked with the I.Q. this year because of my changing role which is associate dean instead of a department head. So I wasn't working directly with him. Well what benefits have you experienced at your college. Anything else you can think of. I I'm not able to say I know it's the kind of thing that I know that you've asked I wouldn't mind asking the department heads. I

hope you're talking to them about it. I don't know that I can say specifically at the college. I can say I've seen a difference. That doesn't mean it's not there. It just means that the things that I look at may not show that there's a change or I may not be able to. I mean there may be a change and I may not be able to directly attributed to the change in the way that works. So any challenges you've experienced in your departments and the programs in place. That's a good question. I don't think so. I think that we needed something like this. I think that having a system in place gives us the proper way to get new questions added. So you know if we needed to do something like this we would have to build it. But having it there means that if for example there's a new program that we would like to screen kids for as they come in this gives us that Antrel way to do that. OK. So I have some general retention data. We're just rating the 6 year graduation day timeline so that's not available in this first year retention. So I'll give you that then you can tell me your general thoughts on it. OK. So in 2010 which is part of the egg you process the retention year of first year students is fifty six point one in 2011 which was the first year it jumped to 67 quite mine. 2012 we were at sixty eight point seven and in 2015 which is the most recent data available. We were at 74 percent. That's correct. So any thoughts about that. Yeah. First of all I would say that part of that. So part of it is is likely a huge part of it is that what I see actually what you see is done in the past five or six years as a larger institutional focus on the metrics that drive our funding actually was part of that. I don't want to diminish the part that the IQ plays actually figuring out what what part of cues specifically plays. It is a good question to ask and is what I would ask. But the way I would say when I think Mary Tanner was provost I'm guessing that was 2012 2012 2013 somewhere in that range. That was the first time that I heard as a faculty member and administrators saying we're going to be measured on retention prior to that. The big thing that I heard people talk about was we need to work on enrollment. This was



bringing people in the door. Retention wise keeping them here once they're in the door. And that was a shift to me and I think she was the first person I personally heard beating that drum. And I would say that you know there have been lots of efforts by around the campus to try to make sure we did a better job of getting good students here. But then also want to see if you're making sure that they have the support they need at you is obviously one of the one of the ways to do that because I can say this from the perspective of somebody in mathematics placement getting somebody in the right place. Right. That especially in their first year is really essential. It's hard for me just to over state how much putting someone in a class a math class that they are destined to do poorly is because of their preparation. That is destructive to especially first year students who are I see as vulnerable. I mean I know from working with her majors that first year very often the term that I can remember a young man in his first year. She's probably five or six years ago now who did not succeed here he left. He was a math major. And I think that he needed more support from us. He did OK in his first math class but then very quickly got out of his depth putting you in the right classes at the right times. That's important. And he plays a part in it. All right well that's a hard question. Any other general comment. No I hope that you will share what she has as a publication. I'm sure she would like to see what she comes up with. All right. Well thank you so much.

## INTERVIEW E

Read OK so what's your understanding of the academic interest questionnaire. Often it is used to help identify information that will allow our institutions or people in those roles that support it to use those responses to create a schedule for incoming students that will match up with their interest and their abilities in the major city. All right. And how have you seen the program of all over the course of time has been used but what it was. Used what we ran into was significant

problems and delays in assigning students to classes. And we would frequently have students only with a limited number of schedules incomplete schedules very frustrated because they couldn't have a full load which in turn upset the parents because the parents are focused on making sure that students are enrolled completely and it affects everything from tuition to insurance coverage and so forth. So when I made the decision to go this route. I think it's been a positive one because in my mind you live as a student or as a parent sure that your. Child or if it's you who's an individual will leave here knowing for certain have a full schedule and all of my classes are going to be. I know that they are going to match what the problems are for the degree that I've indicated. Or if I haven't indicated one that they will be suitable to fit into various degrees once I make that decision. So you talk about this a little bit. Any other benefits you've experienced in your department since the program has been in place. It helps I think it helps us in terms of knowing what the demands for particular forces are. So in the beginning before we used a Q It was the luck of the draw you came as a student and you wanted to take a class and we're sorry it's Bill and you're going to have to find something else. And there's an incoming freshman and particularly you had limited knowledge about how to do that and about what would work. And I fear that a lot of our students ended up in the wrong class or with an incompatible schedule in terms of their own personal obligations or personal behaviors. So maybe it was nine quite close that morning and I ended up in that. And I'm terrible at eight o'clock in the morning. I'm really good the afternoon and evening. So there was a there was a possibility to address some of those factors when you came on board. The other thing is it lets depts plant matter. So if I know that a number of students for example today and a request came out saying we've got this many more students going to be coming through. Please take a look at the courses that you offer and wherever possible indicate you can add additional seats. Tell them what seems to be and so

instead of guessing at the last minute and then facing a long prime time trying to find a suitable schedule. We now have those things done up front and when the student comes here he or she can concentrate on other things. So trying to find a suitable schedule. Right. Take that stress for the first time. And even though they have to do it themselves the second time they've at least gotten through the first semester and then begin to have a sense of this is what I did going forward. Right. So on the other side of that any challenges we've experienced since the program has taken place. I think the challenges are not so much. Programmatic as they are a. So for example if a student comes once you have all the information and the feedback is imperative that we have enough courses to address the needs of the students so that they can make timely progress because the whole issue of progression and retention and ultimately completion hinges on my ability to get those classes I need. And in some instances I was reading an article this morning talking about online. In some instances I think the online might not be the best fit for a brand new college student. It might be a better fit for those who are a little bit more mature who have been around more and having more experience. So my choice would be yes to have some online courses available in all different departments but to be very careful about letting students take them who don't have the experience and treat that up front. Right. Sometimes students want to do it for convenience or occasionally. And we've all gotten into this the class conflict with another class they absolutely have to have preread before they go forward. So they make that choice based on the desire to make good progress. And it may or may not be the best fit. Yeah. So I have some protection data to show that I had any thought about it. So we're just reaching the six year graduation timeline so we don't really have that information. But this is just first year it. So in 2010 which was the year before you started you were at fifty six point one percent first year retention in 2011. It jumped to sixty seven point one in 2012 that was at sixty eight point

seven. And then in 2015 which is the most recent data we have right now it was at 74. So any thoughts about that. Yeah I think it's easier for a person who has been here for very long and for us frustrated to fit into the so if I reach the end of my first year here as a freshman and I find that not only was I not able to get the classes I needed but I only got 12 hours or maybe I couldn't even get 12 hours. I don't have the money to make other choices because of finances or I'm I need to make other choices because I've got to find a place where I can make the kind of purpose I need to make to graduate in whatever time for me I've set aside. I anticipate too that a part of that time will tell. May or may not be impacted by who chooses to come here when they do see promise went into effect. I have no idea what that population of students was that chose to go to the community college route first. So does it mean those who are not quite as confident with that. Well first and got a bit of experience before they came here. So they actually became less of a factor because when they came to us they already had some courses under the belt. I would suspect I have absolutely no evidence to that. I think that might have been one of the factors that affected it so clearly it's it's a stress reducer. It is a good way to map things out. And I think between the ECU and the Clearpath plans I can say here is right and I can match that against that I've had an amazing time with this. OK. Well that's all her questions. Any other general thoughts. I'm out there talking about doing it for other states and they talk quite a bit about transfers. We actually are doing transfer at CU's. They have. And probably the most frustrating group because for about a number of years there were more tiers of the transfer orientations and restoration because those students came to us with very specific needs and they were further along in their journey for getting whatever that Green was. And the obstacles in acquiring a schedule that would let them make progress I think cost a lot of just say I'm done I'll find some place where this will work. And that was not what we were seeking to do but that was the impact. So I think

that a for transfer students. It's a little bit trickier because you have to look at every single one differently you have to figure out where they came from and how happens forces will apply. But in the end if we use it effectively it could become a tool that will really attract transfer students because they'll be have to say they took a long hard look at what I needed and they have made sure that class not going into it if you were undecided. People are starting Freire path is easier to know what they need. So they you can plan for that. And and if we do our job well particularly the community colleges it's more difficult for your institutions but particularly with community colleges if we do our job well we will have a smooth articulation so I know what they took over here. So now I know what they were moving toward here. That's a that's a key that could really improve that process. Have you seen any positive changes yet so far this summer. You know I haven't been involved at the time so I'll be anxious to say. I do know several years ago I'm sure you all saw this too. I do know that several years ago there would be people who would leave who would transfer students with zero hours and that cannot make them feel comfortable about coming here to go to school. Right. That was a huge issue. So I think it just the idea of coming here and even if it's not the perfect schedule even if I have to juggle it I know I'm going to be able to get some classes I need. And that makes me get a lot more comfortable. And you know that that may become one of the best tools we have to use toward progression rotation and rationing and ultimate graduation is to be able to assure people when you come here with one or two years under your belt how many years under your belt however many hours you can rest assured that you will go into valid and required courses as opposed to just finding things that will fill up that hours. The other piece that's critical that's a part of the whole process is a number of programs particularly are college but the colleges to have very strict intrinsic regression requirements. So making sure that those students who come to us know before they get here

here's what you have to have. So you may have taken some classes but it might be a prereg it might be a specific GPA it might be a sort of test. That's got to be a part of what the students know as well. So however we can create a pipeline of information going back to them that lets them know far enough ahead of time they can plan for it. I think would be a smart thing for us to do. Yes. I think that was easy but I really like that over 40. Oh yeah. Pretty cool. See that.

## APPENDIX C

### QUALITATIVE INTERVIEW CODING RESULTS

Perception

**Search in: [DOCUMENT]**  
**Codes: [Feel;Think;Opinions]**

**CASE: INTERVIEW A**

it's evolved. I would say quite a bit. It used to be pretty cumbersome and hard to manage and figure out what went where.

**CASE: INTERVIEW A**

some things that you know it's not quite as robust

**CASE: INTERVIEW A**

You know it's the best rather short of sitting down with each individual soon as we used to do. I think it's the best way to do it

**CASE: INTERVIEW A**

I think that sometimes it's difficult to engage the student to fill it out properly

**CASE: INTERVIEW A**

it has helped us tremendously it's actually a recruiting tool that we use on freshmen

**CASE: INTERVIEW A**

So I think for use of their time while they're here it's much much better.

**CASE: INTERVIEW A**

There's not that sense of panic among the freshmen anymore.

**CASE: INTERVIEW A**

You know it's evolved

**CASE: INTERVIEW A**

I don't know a better way to do it.

**CASE: INTERVIEW A**



You know I think it's just such a less stressful situation

**CASE: INTERVIEW B**

on that endeavor it seemed great

**CASE: INTERVIEW B**

people would probably pay more attention to what was being said to them they could have just as scared or better and be in a better place and be happier about it

**CASE: INTERVIEW B**

kind of take some of the stress off and people did not have to worry about not having a full time schedule

**CASE: INTERVIEW C**

I understand the purpose behind trying to build schools for all freshmen before they arrive and the significance of that and I think that's a powerful thing to do when the students come with forestation the first day we meet them separately in the session where they do other stuff on campus

**CASE: INTERVIEW C**

I think it freaked me out

**CASE: INTERVIEW C**

I mean they're instrumental for us and building schedules.

**CASE: INTERVIEW E**

And you know that that may become one of the best tools we have to use toward progression rotation and rationing and ultimate graduation is to be able to assure people when you come here with one or two years under your belt how many years

**CASE: INTERVIEW B**

that's a hard loss when you've got em all the way through the system and they've hit all the bits marks into here and not have classes and walk away frustrated that's bad PR and you know that word of mouth really hurt

**CASE: INTERVIEW E**

if a student comes once you have all the information and the feedback is imperative that we have enough courses to address the needs of the students so that they can make timely progress because the whole issue of progression and retention and ultimately completion hinges on my ability to get those classes I need.

**CASE: INTERVIEW B**

It gives us a better read on what our freshman class looks like. So you know if you're a committed like Dad you're going to answer about classes and picking out things that means you're pretty vested in you being an option for you

**CASE: INTERVIEW B**

t's a little bit intimidating. It's probably the first time that some of these students right. Oh it's like I'm really picking this as my school you know. So we've forced their hand a little bit earlier

**CASE: INTERVIEW E**

Take that stress for the first time

**CASE: INTERVIEW D**

It's hard for me just to over state how much putting someone in a class a math class that they are destined to do poorly is because of their preparation. That is destructive to especially first year students who are I see as vulnerable

**CASE: INTERVIEW B**

when this idea got brought up it seemed like a lot of work up for it but it seemed like

**CASE: INTERVIEW E**

The other thing is it lets depts plant matter. So if I know that a number of students for example today and a request came out saying we've got this many more students going to be coming through. Please take a look at the courses that you offer and wherever possible indicate you can add additional seats

**CASE: INTERVIEW E**

And I fear that a lot of our students ended up in the wrong class or with an incompatible schedule in terms of their own personal obligations or personal behaviors.

**CASE: INTERVIEW B**

preparedness probably has helped our actual enrollment number because we did not have students leave here that were frustrated because they didn't have enough classes.

**CASE: INTERVIEW B**

not specific challenges out things with our office.

**CASE: INTERVIEW D**

But having it there means that if for example there's a new program that we would like to screen kids for as they come in this gives us that Antrel way to do that. OK.

**CASE: INTERVIEW B**

but as it evolved and we were able to merge it together and it became part of a process that was worse individuals that we had to do before they got here

**CASE: INTERVIEW D**

I think that we needed something like this. I think that having a system in place gives us the proper way to get new questions added.

**CASE: INTERVIEW D**

I can say I've seen a difference

**CASE: INTERVIEW B**

So I think that's a very positive thing for that in result of the students that enroll here

**CASE: INTERVIEW A**

I would be hard pressed not to think that ARPU plays a big role in that. That the students feel comfortable with their schedules and knowing about their schedules

**CASE: INTERVIEW B**

So I think it made the parents feel more confident about our bodies and our about the way that we would handle their student and things like that. It just benefited. I think we've been affected that way that the people that were coming in and saying they were interested we did not lose people because they didn't have classes to take.

**CASE: INTERVIEW B**

it just seems like a smarter way to do business

**CASE: INTERVIEW B**

I think the benefits much outweigh maybe some people's hesitancy to do it first and then we went back and addressed how do we make this more user friendly so it's not so intimidating to somebody so you know I think it's pretty positive.

**CASE: INTERVIEW E**

I think it's been a positive one because in my mind you live as a student or as a parent sure that your. Child or if it's you who's an individual will leave here knowing for certain have a full schedule and all of my classes are going to be. I know that they are going to match what the problems are for the degree that I've indicated.

**CASE: INTERVIEW E**

It helps I think it helps us in terms of knowing what the demands for particular forces are. So in the beginning before we used a Q It was the luck of the draw you came as a student and you wanted to take a class and we're sorry it's Bill and you're going to have to find something else

**CASE: INTERVIEW A**

I think it's running well

**CASE: INTERVIEW A**

I think everybody on campus understands how it works now

**CASE: INTERVIEW D**

also want to see if you're making sure that they have the support they need at you is obviously one of the one of the ways to do that because I can say this from the perspective of somebody in mathematics placement getting somebody in the right place. Right. That especially in their first year is really essential.

**CASE: INTERVIEW E**

they have to do it themselves the second time they've at least gotten through the first semester and then begin to have a sense of this is what I did going forward.

**CASE: INTERVIEW E**

I think the challenges are not so much

**CASE: INTERVIEW D**

things that I look at may not show that there's a change or I may not be able to. I mean there may be a change and I may not be able to directly attributed to the change in the way that works. So

**CASE: INTERVIEW E**

In some instances I think the online might not be the best fit for a brand new college student. It might be a better fit for those who are a little bit more mature who have been around more and having more experience.

**CASE: INTERVIEW C**

Since many of them are coming to us with 30 hours of gender it's difficult because then you end up taking courses that sort of double count rises. And this is going to be a bigger and bigger problem

Administrative

**Search in: [DOCUMENT]  
Codes: [Process;Policy;Procedure;Change]**

**CASE: INTERVIEW A**

academic interest questionnaire

**CASE: INTERVIEW B**

You know you need this many more English slots or you know this when one mass flight it just seems like a smarter way to do business

**CASE: INTERVIEW A**

so it's evolved. I would say quite a bit

**CASE: INTERVIEW A**

It used to be pretty cumbersome and hard to manage and figure out what went where.

**CASE: INTERVIEW A**

still some things that you know it's not quite as robust

**CASE: INTERVIEW A**

You know it's the best rather short of sitting down with each individual soon as we used to do. I think it's the best way to do it

**CASE: INTERVIEW A**

I think that sometimes it's difficult to engage the student to fill it out properly

**CASE: INTERVIEW B**

you can address the shortages of classes in it's real people not guesses

**CASE: INTERVIEW B**

freshmen new not understand there was a lot of explanation that needed to happen in a very small amount of time in orientation it was too stressful

**CASE: INTERVIEW E**

some online courses available in all different departments but to be very careful about letting students take them who don't have the experience and treat that up front

**CASE: INTERVIEW A**

So we use it heavily in recruiting

**CASE: INTERVIEW B**

hat helped with kind of the people maybe hesitating at first to go ahead and reserve a spot.

**CASE: INTERVIEW B**

So we all learned how to do that better and then I'm pretty sure they did also or if not they were going to do a video

**CASE: INTERVIEW E**

incomplete schedules very frustrated because they couldn't have a full load which in turn upset the parents because the parents are focused on making sure that students are enrolled completely and it affects everything from tuition to insurance coverage and so forth

**CASE: INTERVIEW A**

I don't know a better way to do it

**CASE: INTERVIEW A**

I think it's running well

**CASE: INTERVIEW B**

We did offer some phone calls and emails to students who it looked like they started the process and didn't finish it

**CASE: INTERVIEW B**

The only thing students want to talk about are how many spaces are left in this class like that was the only conversation that was happening in you know the minute that you printed the list of the open sections

**CASE: INTERVIEW C**

Since many of them are coming to us with 30 hours of gender it's difficult because then you end up taking courses that sort of double count rises. And this is going to be a bigger and bigger problem.

**CASE: INTERVIEW B**

And that's really it drove the whole process. Now they're not driving the whole process.

**CASE: INTERVIEW E**

what we ran into was significant problems and delays in assigning students to classes

**CASE: INTERVIEW D**

but the acute process was the right way for us to find out about that because what had happened before was it students would just show up randomly in the math department call the math department

**CASE: INTERVIEW D**

process was I think better at finding those things

**CASE: INTERVIEW B**

Shortage of classes

**CASE: INTERVIEW B**

not specific challenges out things with our office

**CASE: INTERVIEW B**

that's a hard loss when you've got em all the way through the system and they've hit all the bits marks into here and not have classes

**CASE: INTERVIEW D**

that what I see actually what you see is done in the past five or six years as a larger institutional focus on the metrics that drive our funding actually was part of that. I don't want to diminish the part that the IQ plays actually figuring out what what part of cues specifically plays.

**CASE: INTERVIEW B**

tied to our orientation reservation system so students will select a date and then actually to complete the orientation process they enter the survey so their advisors can self you know not advise but register them prior to a tee indeed and match classes for them so that it's not the only thing that we do at orientation so it's part of the reservation process

**CASE: INTERVIEW A**

how can we quickly. Add more classes to make sure it has. Courses to take

**CASE: INTERVIEW A**

re going through the orientation process part in order to finish each process they must fill out a questionnaire. And it's a good way for us to gauge a first schedule for the student to which they can make changes

**CASE: INTERVIEW C**

onboarding students

**CASE: INTERVIEW C**

I mean they're instrumental for us and building schedules.

**CASE: INTERVIEW B**

I think the benefits much outweigh maybe some people's hesitancy to do it first and then we went back and addressed how do we make this more user friendly

**CASE: INTERVIEW D**

And that question helped us identify their students and place them correctly. We've now looked at how those students have performed because we know we've placed them in those classes for that reason and we then saw that perhaps we needed to back off and send them through another course in front of that



**CASE: INTERVIEW D**

when I think Mary Tanner was provost I'm guessing that was 2012 2012 2013 somewhere in that range. That was the first time that I heard as a faculty member and administrators saying we're going to be measured on retention prior to that. The big thing that I heard people talk about was we need to work on enrollment. This was bringing people in the door. Retention wise keeping them here once they're in the door. And that was a shift to me and I think she was the first person I personally heard beating that drum

**CASE: INTERVIEW A**

miss a lot of students who are taking dual enrollment or AP credit

**CASE: INTERVIEW C**

My understanding is that students cannot sign up for. Orientation

**CASE: INTERVIEW A**

We're changing one class here they are instead of building entire schedules. So I think for use of their time while they're here it's much much better

**CASE: INTERVIEW A**

Given us more freedom in the summer to attend to other things beyond just orientation all summer long hoping to get classes. Right

**CASE: INTERVIEW B**

as it evolved and we were able to merge it together and it became part of a process that was worse individuals that we had to do before they got here

**CASE: INTERVIEW B**

when this idea got brought up it seemed like a lot of work up for it but it seemed like

**CASE: INTERVIEW D**

But having it there means that if for example there's a new program that we would like to screen kids for as they come in this gives us that Antrel way to do that. OK

**CASE: INTERVIEW D**

I think that having a system in place gives us the proper way to get new questions added.

**CASE: INTERVIEW D**

I mean there may be a change and I may not be able to directly attributed to the change in the way that works

**CASE: INTERVIEW A**

You know it's evolved. You know at the beginning there were a lot of challenges with information that couldn't see students for days on end after they filled out. And now it's much faster

**CASE: INTERVIEW E**

for example today and a request came out saying we've got this many more students going to be coming through. Please take a look at the courses that you offer and wherever possible indicate you can add additional seats.

**CASE: INTERVIEW E**

instead of guessing at the last minute and then facing a long prime time trying to find a suitable schedule. We now have those things done up front and when the student comes here he or she can concentrate on other things.

**CASE: INTERVIEW A**

helped us tremendously it's actually a recruiting tool that we use on freshmen

Student Success

**Search in: [DOCUMENT]**

**Codes: [Retention;Grades;Grading;Stay;Improve;Recruiting;Placement;Enrollment]**

**CASE: INTERVIEW E**

if a student comes once you have all the information and the feedback is imperative that we have enough courses to address the needs of the students so that they can make timely progress because the whole issue of progression and retention and ultimately completion hinges on my ability to get those classes I need

**CASE: INTERVIEW E**

when the student comes here he or she can concentrate on other things

**CASE: INTERVIEW B**

preparedness probably has helped our actual enrollment number because we did not have students leave here that were frustrated because they didn't have enough classes.

**CASE: INTERVIEW B**

we did not lose people because they didn't have classes to take

**CASE: INTERVIEW D**

sales or bridge math

**CASE: INTERVIEW B**

that helped with kind of the people maybe hesitating at first to go ahead and reserve a spot

**CASE: INTERVIEW B**

I think the benefits much outweigh maybe some people's hesitancy to do it first and then we went back and addressed how do we make this more user friendly so it's not so intimidating to somebody so you know I think it's pretty positive.

**CASE: INTERVIEW E**

And I fear that a lot of our students ended up in the wrong class or with an incompatible schedule in terms of their own personal obligations or personal behaviors.

**CASE: INTERVIEW D**

And that question helped us identify their students and place them correctly. We've now looked at how those students have performed because we know we've placed them in those classes for that reason and we then saw that perhaps we needed to back off and send them through another course in front of that.

**CASE: INTERVIEW D**

we did which in mathematics was we we needed information on placement in one of the questions that we added at the time was whether

**CASE: INTERVIEW D**

what they think their math placement might be

**CASE: INTERVIEW D**

It's hard for me just to over state how much putting someone in a class a math class that they are destined to do poorly is because of their preparation. That is destructive to especially first year students who are I see as vulnerable.

**CASE: INTERVIEW B**

Oh it's like I'm really picking this as my school you know. So we've forced their hand a little bit earlier

**CASE: INTERVIEW B**

It gives us a better read on what our freshman class looks like

**CASE: INTERVIEW B**

pretty vested in you being an option for you

**CASE: INTERVIEW E**

Take that stress for the first time.

**CASE: INTERVIEW A**

helped us tremendously it's actually a recruiting tool that we use on freshmen

**CASE: INTERVIEW A**

I think it's more about. You know here is what college is going to be like here's all the great things we offer instead of this stressful

**CASE: INTERVIEW A**

We can't. Account for how it affects the data. But I would be hard pressed not to think that ARPU plays a big role in that. That the students feel comfortable with their schedules and knowing about their schedules

**CASE: INTERVIEW A**

I think it's just such a less stressful situation

**CASE: INTERVIEW D**

Retention wise keeping them here once they're in the door. And that was a shift to me and I think she was the first person I personally heard beating that drum

**CASE: INTERVIEW C**

I understand that it's a kind of a retention tool or maybe I don't know what you call it you know what you're onboarding students but it's something that subverts their attendance their role in I guess I got that. I've never seen any data to show that it actually is effective. So that would be useful to see that it really doesn't prove the enrollment of students or move moving students from interest in application acceptance to actually classes.

**CASE: INTERVIEW D**

saying we're going to be measured on retention

**CASE: INTERVIEW E**

instances I think the online might not be the best fit for a brand new college student. It might be a better fit for those who are a little bit more mature who have been around more and having more experience

Open Coding for Qualitative Interviews

Open Code	Properties	Examples of participants' words
Student Success	Retention Grades Grading Stay Improve Recruiting Placement Enrollment	<p>It is imperative that we have enough courses to address the needs of students so that they can make timely progress</p> <p>When the student comes here he or she can concentrate on other things</p> <p>Preparedness has probably helped our actual enrollment number because we did not have students leave here that were frustrated because they didn't have enough classes</p> <p>We did not lose people because they didn't have classes to take</p>

Open Code	Properties	Examples of participants' words
		<p>Helped with kind of the people maybe hesitating at first to go ahead and reserve a spot</p> <p>I think the benefits much outweigh maybe some people's hesitancy to do it first</p> <p>We went back and addressed how do we make this more user friendly so it's not so intimidating to somebody</p> <p>I think it's pretty positive</p> <p>I fear that a lot of our students ended up in the wrong class or with an incompatible schedule in terms of their own personal obligations or personal behaviors</p> <p>That question helped us identify their students and place them correctly</p> <p>We've now looked at how those students have performed because we know we've placed them in those classes for that reason</p> <p>We needed information on placement</p> <p>What they think their math placement might be</p> <p>It's hard for me just to over state how much putting someone in a class a math class that they are destined to</p>

Open Code	Properties	Examples of participants' words
		<p>do poorly is because of their preparation. That is destructive to especially first year students who are I see as vulnerable.</p> <p>Oh it's like I'm really picking this as my school you know. So we've forced their hand a little bit earlier</p> <p>It gives us a better read on what our freshman class looks like</p> <p>Pretty vested in you being an option for you</p> <p>Take that stress for the first time.</p> <p>Helped us tremendously it's actually a recruiting tool that we use on freshmen</p> <p>You know here is what college is going to be like here's all the great things we offer instead of this stressful</p> <p>We can't. Account for how it affects the data. But I would be hard pressed not to think that ARPU plays a big role in that. That the students feel comfortable with their schedules and knowing about their schedules</p> <p>I think it's just such a less stressful situation</p>

Open Code	Properties	Examples of participants' words
		<p>Retention wise keeping them here once they're in the door. And that was a shift to me</p> <p>I understand that it's a kind of a retention tool or maybe I don't know what you call it you know what you're onboarding students but it's something that subverts their attendance</p> <p>I've never seen any data to show that it actually is effective. So that would be useful to see that it really doesn't prove the enrollment of students or move moving students from interest in application acceptance to actually classes</p> <p>Saying we're going to be measured on retention</p> <p>I think the online might not be the best fit for a brand new college student</p>
Administrative	Process Policy Procedure Change	<p>Smarter way to do business</p> <p>It's evolved. I would say quite a bit</p> <p>Used to be pretty cumbersome and hard to manage and figure out what went where</p> <p>It's not quite as robust</p>



Open Code	Properties	Examples of participants' words
		<p>I think it's the best way to do it</p> <p>Sometimes it's difficult to engage the student to fill it out properly</p> <p>You can address the shortages of classes</p> <p>It was too stressful</p> <p>We use it heavily in recruiting</p> <p>People maybe hesitating at first to go ahead and reserve a spot</p> <p>We all learned how to do that better</p> <p>They couldn't have a full load which in turn upset the parents</p> <p>It affects everything from tuition to insurance coverage and so forth</p> <p>I don't know a better way to do it</p> <p>I think it's running well</p> <p>It drove the whole process</p> <p>We ran into significant problems and delays in assigning students to classes</p>

Open Code	Properties	Examples of participants' words
		<p>Process was better at finding those things</p> <p>Shortage of classes</p> <p>Not specific challenges</p> <p>Larger institutional focus on the metrics that drive our funding</p> <p>Match classes for them so that it's not the only thing that we do at Orientation</p> <p>It's a good way for us to gauge a first schedule for the students</p> <p>Onboarding students</p> <p>They're instrumental for us and building schedules</p> <p>The benefits much outweigh maybe some people's hesitancy</p> <p>Then we went back and addressed how do we make this more user friendly</p> <p>Helped us identify their students and place them correctly</p> <p>We're going to be measured on retention</p> <p>We need to work on enrollment</p>

Open Code	Properties	Examples of participants' words
		<p>Miss a lot of students who are taking dual enrollment or AP credit</p> <p>We're changing one class here they are instead of building entire schedules</p> <p>I think for use of their time while they're here it's much much better</p> <p>Given us more freedom in the summer to attend to other things</p> <p>It became part of a process</p> <p>There's a new program that we would like to screen kids for as they come in</p> <p>I think that having a system in place gives us the proper way to get new questions added</p> <p>You know it's evolved</p> <p>And now it's much faster</p> <p>Take a look at the courses that you offer and wherever possible indicate you can add additional seats</p> <p>Instead of guessing at the last minute</p> <p>We now have those things done up front</p>

Open Code	Properties	Examples of participants' words
		<p>When the student comes here he or she can concentrate on other things</p> <p>Helped us tremendously</p> <p>Actually a recruiting tool that we use on freshmen</p>
Perception	<p>Feel</p> <p>Think</p> <p>Opinions</p>	<p>It's evolved. I would say quite a bit.</p> <p>It used to be pretty cumbersome and hard to manage and figure out what went where</p> <p>Some things that you know it's not quite as robust</p> <p>You know it's the best rather short of sitting down with each individual soon as we used to do</p> <p>I think it's the best way to do it</p> <p>I think that sometimes it's difficult to engage the student to fill it out properly</p> <p>It has helped us tremendously</p> <p>It's actually a recruiting tool that we use on freshmen</p> <p>I think for use of their time while they're here it's much much better</p>

Open Code	Properties	Examples of participants' words
		<p>There's not that sense of panic among the freshmen anymore</p> <p>You know it's evolved</p> <p>I don't know a better way to do it</p> <p>You know I think it's just such a less stressful situation</p> <p>On that endeavor it seemed great</p> <p>People would probably pay more attention to what was being said to them they could have just as scared or better and be in a better place and be happier about it</p> <p>Kind of take some of the stress off and people did not have to worry about not having a full time schedule</p> <p>I understand the purpose behind trying to build schools for all freshmen before they arrive and the significance of that and I think that's a powerful thing to do</p> <p>The first day we meet them separately in the session where they do other stuff on campus</p> <p>I think it freaked me out</p> <p>I mean they're instrumental for us and building schedules</p> <p>That that may become one of the best tools we have to use</p>

Open Code	Properties	Examples of participants' words
		<p>toward progression rotation and rationing and ultimate graduation</p> <p>That's a hard loss when you've got em all the way through the system and they've hit all the bits marks into here and not have classes and walk away frustrated that's bad PR and you know that word of mouth really hurt</p> <p>If a student comes once you have all the information and the feedback is imperative that we have enough courses to address the needs of the students</p> <p>So that they can make timely progress because the whole issue of progression and retention and ultimately completion hinges on my ability to get those classes I need</p> <p>It gives us a better read on what our freshman class looks like</p> <p>You're going to answer about classes and picking out things that means you're pretty vested</p> <p>It's a little bit intimidating.</p> <p>I'm really picking this as my school you know. So we've forced their hand a little bit earlier</p>

Open Code	Properties	Examples of participants' words
		<p>Take that stress for the first time</p> <p>It's hard for me just to overstate how much putting someone in a class a math class that they are destined to do poorly is because of their preparation. That is destructive to especially first year students who are I see as vulnerable</p> <p>When this idea got brought up it seemed like a lot of work</p> <p>The other thing is it lets departments matter. So if I know that a number of students for example today and a request came out saying we've got this many more students going to be coming through. Please take a look at the courses that you offer and wherever possible indicate you can add additional seats</p> <p>And I fear that a lot of our students ended up in the wrong class or with an incompatible schedule in terms of their own personal obligations or personal behaviors</p> <p>Preparedness probably has helped our actual enrollment number because we did not have students leave here that were frustrated because they didn't have enough classes</p>

Open Code	Properties	Examples of participants' words
		<p>Not specific challenges out things with our office</p> <p>But having it there means that if for example there's a new program that we would like to screen kids for as they come in</p> <p>But as it evolved and we were able to merge it together and it became part of a process</p> <p>I think that we needed something like this</p> <p>I think that having a system in place gives us the proper way to get new questions added</p> <p>I can say I've seen a difference</p> <p>So I think that's a very positive thing for that in result of the students that enroll here</p> <p>I would be hard pressed not to think that ARPU plays a big role in that</p> <p>That the students feel comfortable with their schedules and knowing about their schedules</p> <p>So I think it made the parents feel more confident about our bodies and our about the way</p>



Open Code	Properties	Examples of participants' words
		<p>that we would handle their student and things like that</p> <p>It just it benefited</p> <p>I think we've been affected that way that the people that were coming in and saying they were interested we did not lose people because they didn't have classes to take</p> <p>It just seems like a smarter way to do business</p> <p>I think the benefits much outweigh maybe some people's hesitancy to do it first</p> <p>Then we went back and addressed how do we make this more user friendly</p> <p>So it's not so intimidating to somebody so you know I think it's pretty positive</p> <p>I think it's been a positive one because in my mind you live as a student or as a parent sure</p> <p>Will leave here knowing for certain have a full schedule and all of my classes are going to be</p> <p>I know that they are going to match what the problems are</p>

Open Code	Properties	Examples of participants' words
		<p>for the degree that I've indicated</p> <p>It helps I think it helps us in terms of knowing what the demands for particular forces are</p> <p>So in the beginning before we used a Q It was the luck of the draw you came as a student and you wanted to take a class and we're sorry it's Bill and you're going to have to find something else</p> <p>I think it's running well</p> <p>I think everybody on campus understands how it works now</p> <p>Also want to see if you're making sure that they have the support they need at you is obviously one of the one of the ways to do that because I can say this from the perspective of somebody in mathematics placement getting somebody in the right place</p> <p>They have to do it themselves the second time they've at least gotten through the first semester and then begin to have a sense of this is what I did going forward</p>

Open Code	Properties	Examples of participants' words
		<p>I think the challenges are not so much</p> <p>There may be a change and I may not be able to directly attributed to the change in the way that works</p> <p>In some instances I think the online might not be the best fit for a brand new college student</p> <p>Since many of them are coming to us with 30 hours of gender it's difficult because then you end up taking courses that sort of double count rises. And this is going to be a bigger and bigger problem</p>

## VITA

Laura Katherine Hazlewood Bass was raised in Sulphur, Louisiana, and graduated in 1998 from Sulphur High School. In August 1998, she began college at the University of Louisiana at Lafayette (ULL), initially pursuing a major and career in Visual Arts Graphic Design; later changing to an English major. In 2002, Laura completed her Bachelor of Arts degree with an English major at ULL, and moved to Oxford, Mississippi with her husband Michael to pursue graduate school at the University of Mississippi (Ole Miss). In August 2004, Laura was awarded a Master of Arts degree in Higher Education Administration-Student Personnel from Ole Miss. Laura and Michael immediately moved to Chattanooga, Tennessee for Laura to begin work at UTC. Laura worked in Financial Aid as the Student Loan Coordinator at UTC for several years before transitioning to the UTC Records Office in 2008, where she served as the Assistant Registrar until 2013. During this time, Laura began her studies in the UTC Learning and Leadership Doctorate of Education program. In 2013, Laura moved to the Center for Advisement to become an academic advisor and instructor of First Year students, and currently maintains this position. From 2014-2015, Laura also served as the Coordinator of Student Engagement in the UTC First Year Experience program. In 2017, Laura modified her academic plan to pursue the Doctorate of Philosophy in the UTC Learning and Leadership program, and she will complete the requirements of this degree in 2018.